



Presentations Available From SAS

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SAS® GLOBAL FORUM 2016

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Administration

Administration: Architecture

Administering and Monitoring Your SAS® Visual Analytics Environment

Understanding your role as an administrator is key to a successful and healthy environment. It is your role to lay down the groundwork for your users and to administer and maintain a healthy environment for everyone. The main ingredient in SAS Visual Analytics is the SAS® LASR™ Analytic Server. This server is an in-memory engine designed to address diverse advanced analytic use cases in an extremely scalable manner. This presentation will give you the tools to get a successful start with SAS Visual Analytics. We will examine metadata objects and data management, talk about monitoring your resources for availability and stability, and take a look at managing data load in memory and your co-located data provider. Depending on whether you have a distributed or nondistributed environment, the administration tasks may vary in complexity.

CL

Commonly Asked Questions About Metadata

New and experienced SAS® administrators may have basic questions about the SAS 9.3 Management Console and specifically about metadata, such as: “What is it?”, “Why is it important?” and “How do I keep it up to date?” This presentation reviews frequently asked questions and provides useful and practical answers.

CL

Failover in a SAS® Grid Environment

Using SAS Grid Manager, you can control grid resources and provide high availability for the metadata server and midtier components. In a failover scenario, SAS Grid Manager detects that a “production” node has failed and reassigns any running SAS processes to other available nodes in the grid. In this presentation, we’ll provide you with a high-level overview of how it all works from an administrator perspective.

CL

Feeling Anxious About Transitioning From Desktop to Server? Key Considerations to Diminish Your Administrators’ and Users’ Jitters

As more organizations move their SAS operations from PCs to servers, administrators and users share many misgivings about using SAS on a Microsoft Windows server. This paper outlines key architecture and performance considerations so that you can conduct proper planning and know what to expect. It provides guidelines to help you formulate and execute appropriate plans that will diminish your server-induced anxiety.

SASGF15

Frequently Asked Questions Regarding Storage Configurations

The SAS® Global Forum paper Best Practices for Configuring Your IO Subsystem for SAS®9 Applications (revised May 2014) provides general guidelines for configuring I/O subsystems for your SAS applications. Since that paper was first published in 2007, more advanced questions from the field and rapidly updated storage technology necessitated updating the original paper. This updated paper includes new information concerning new storage technologies such as storage virtualization, storage tiers (including automated tier management) and flash storage. The subject matter is voluminous, so a frequently asked questions (FAQ) format is used. Our goal is to continually update this paper as additional field needs arise and technology dictates. To ensure that you have the most recent copy of the paper, be sure to reference the revision date above.

SASGF15

High Availability and Failover With SAS® 9.4 Metadata Server Clusters

A high-availability or failover cluster provides continued service when system components fail. Beginning in SAS 9.4, SAS supports clustered SAS Metadata Server configurations. In a clustered SAS Metadata Server configuration, SAS Metadata Servers are linked together to provide for metadata redundancy and make all of the metadata servers available for processing requests. If one metadata server becomes unavailable, its load is transferred to another metadata server. We will take a look at the setup and different configuration scenarios.

CL

How to Maintain Happy SAS® Users: A SAS® Environment Primer for IT Professionals

Today's SAS environment has large numbers of concurrent SAS processes and ever-growing data volumes. To help SAS users remain productive, SAS administrators must ensure that SAS applications have sufficient computer resources and are properly configured and monitored often. Understanding how all the components of SAS work and how they will be used by your users is the first step. The guidance offered in this paper will help SAS administrators evaluate hardware, operating system and infrastructure options for a SAS environment that will keep their SAS applications running at optimal performance and their user community happy.

SASGF15

Important Things to Know When Deploying SAS® Grid Manager

SAS Grid Computing promises many benefits that the SAS community has been demanding for years, including workload management of SAS applications, a highly available infrastructure, higher resource utilization, flexibility for IT infrastructure and potentially improved performance of SAS applications. But to implement these benefits, you need to have a good definition of what you need and an understanding of what is involved in enabling the SAS tasks to take advantage of all the SAS grid nodes. In addition, the underlying hardware infrastructure (cores to storage) must be configured and tuned correctly. Learn what you need to know before deploying SAS Grid Manager.

SASGF15

Planning for the Worst: SAS® Grid Manager and Disaster Recovery

Many companies use geographically dispersed data centers running SAS Grid Manager to provide 24/7 SAS processing capability with the thought that if a disaster takes out one of the data centers, another data center can take over the SAS processing. To accomplish this, careful planning must take into consideration hardware, software and communication infrastructure along with the SAS workload. This paper looks into some of the options available, focusing on using SAS Grid Manager to manage the disaster workload shift.

SASGF15

SAS®9 Business Intelligence Platform Architecture

SAS®9 Business Intelligence is a set of software tools and applications that enable business users and analysts to interact with their company data in an easy, efficient and effective manner. It provides SAS server processes for client applications and a centralized metadata management facility. This session will introduce you to these features.

CL

SAS® Scalable Performance Data Server (SPD Server)

The SAS Scalable Performance Data Server is a data storage system optimized to deliver, quickly and on demand, subsets of information harvested from large enterprise data stores. This presentation will introduce you to the efficiency of scalable data concepts in SAS.

CL

SAS® Grid Manager: A Building Block Approach

Wouldn't it be great if there were a way to deploy SAS Grid Manager in discrete building blocks that have the proper balance of compute capability, RAM and IO throughput? Well, now there is! This paper discusses the attributes of a well-designed SAS Grid Manager deployment and why it is sometimes difficult to engineer such an environment when IT responsibilities are segregated between server administration, network administration and storage administration. The paper presents a concrete design that will position the customer for a successful SAS Grid Manager deployment of any size and that can also scale out easily as the needs of the organization grow.

SASGF15

SAS® Architecture and Security Administration Best Practices

This presentation covers best practices for encryption in SAS (encryption in transit and encryption at rest options), SAS backups, Kerberos and SAS. You will also learn usage, security and best practices for how to make use of multiple SAS environments (Dev, Test, Prod) and how to secure the metadata and data differently between each environment. This presentation covers configuring segregated business units within SAS, particularly how the metadata and file system would be configured.

CES

Web Services and SAS®: So Happy Together

This presentation provides best practices for turning a stored process into a Web service and how to make Web service calls to execute SAS code.

CES

Administration: Deployment

Latest and Greatest: Best Practices for Migrating to SAS® 9.4

SAS customers benefit greatly when they are making use of the functionality, performance and stability available in the latest version of SAS. However, the task of moving all SAS collateral – such as programs, data, catalogs, metadata (stored processes, maps, queries, reports and so on) – and content to SAS 9.4 can seem daunting. This paper provides an overview of the steps required to move all SAS collateral from systems based on SAS 9.2 and SAS 9.3 to the current release of SAS 9.4.

SASGF15

Administration: SAS® Administration

The Left Brain Vs. Right Brain of SAS® Metadata Administration and Management

Like the human brain, where the left brain is characterized as logical and technical, and the right brain is characterized as fluid and spontaneous, so too can SAS Metadata be envisioned from the point of view of technical metadata (left brain) and business metadata (right brain). This presentation and demonstration will guide the new SAS systems administrator in understanding the top functions to be performed inside and outside of SAS Management Console in order to support a community of users utilizing SAS® Enterprise Guide®, SAS Enterprise Business Intelligence, SAS enterprise data intelligence or SAS® Enterprise Miner™.

CL

Hands-Off SAS® Administration: Using Batch Tools to Make Your Life Easier

As a SAS intelligence platform administrator, have you ever had your eyes glaze over as you performed repetitive tasks in SAS Management Console or some other administrative user interface? Perhaps you're setting up metadata for a new department, managing a set of backups, or promoting content between dev, test and prod environments. Did you know there is a large library of batch utilities to help you automate many of these common administration tasks? This paper explores content reporting and management utilities, such as viewing authorizations or relationships between content, as well as administrative tasks such as analyzing, creating or deleting metadata repositories or performing a backup of the system. The batch utilities can be incorporated into scripts so that you can run them repeatedly on either an ad hoc or scheduled basis. Give your mouse a rest and save yourself some time.

SASGF15

Maintaining a Healthy SAS® Environment

This presentation offers helpful information and tools to administer either a metadata or a nonmetadata environment. Topics include understanding your SAS environment, applying a setinit, logging options, gathering information about the current configuration and environment using PROC OPTIONS, hot fixes and more.

CL

Metadata Security

It is very important to ensure that only authorized users have access to sensitive data sources, that users access the appropriate servers based on tasks, priorities and other factors, and that stored processes and other objects are protected. These topics and others are addressed in this presentation on SAS metadata security.

CL

SAS® Management Console Administration

The SAS Management Console is a Java-based SAS application tool for SAS administrators to manage servers, libraries, security, metadata objects, user roles, logs, backup and recovery tasks, and more. This presentation provides an introduction to the SAS Management Console, the primary administrative interface for the SAS intelligence platform.

CL

Analytics

Data Preparation Techniques for Analytics in SAS® Enterprise Guide®

In this session, we will cover the data structures required for different types of analytics, including descriptive statistics, modeling, multivariate analysis, forecasting and quality control. Using SAS Enterprise Guide, we will look at examples on how to create these data structures from raw or transactional data.

CL

Introduction to Text Mining and an Overview of SAS® Text Miner

What exactly is text mining, and how can your organization tap into the vast amounts of unstructured data available? Call center notes, open-ended survey responses, product reviews, claim descriptions, tweets and many more sources contain potentially valuable information. This presentation will introduce you to the basic concepts of mining text data and give you a guided tour of SAS Text Miner.

CL

A Top 10 List: Advantages of Using SAS® Enterprise Miner™ for Predictive Modeling

SAS Enterprise Miner contains an unmatched suite of modeling techniques and algorithms. This broad toolset helps overcome common challenges of data mining and provides a comprehensive workbench to manage the entire process. Learn some of many ways that SAS Enterprise Miner can benefit data miners and organizations, including increased productivity and more accurate models.

CL

Advanced Techniques for Fitting Mixed Models Using SAS/STAT® Software

Fitting mixed models to complicated data, such as data that includes multiple sources of variation, can be a daunting task. SAS/STAT software offers several procedures and approaches for fitting mixed models. This paper provides guidance on how to overcome obstacles that commonly occur when you are fitting mixed models using the MIXED and GLIMMIX procedures. Examples are used to showcase procedure options and programming techniques that can help you overcome difficult data and modeling situations.

SASGF15

An Overview of Econometrics Tools in SAS/ETS®: Explaining the Past and Modeling the Future

The importance of econometrics in the analytics toolkit is increasing every day. Econometric modeling helps uncover structural relationships from observational data. This paper highlights the many recent changes to the SAS/ETS portfolio that increase your power to explain the past and predict the future. Examples show how you can use Bayesian regression tools for price elasticity modeling, use state space models to gain insight from inconsistent time series, use panel data methods to help control for unobserved confounding effects, and much more.

SASGF15

Analyzing Messy and Wide Data on a Desktop

Data comes from a rich variety of sources in a rich variety of types, shapes, sizes and properties. The analysis can be challenged by data that is too tall or too wide; too full of miscodings, outliers or holes; or that contains funny data types. Wide data, in particular, has many challenges, requiring the analysis to adapt with different methods. Making covariance matrices with 2.5 billion elements is just not practical. JMP® 12 will address these challenges.

SASGF15

Clustering With JMP®

Learn how to perform clustering analyses with JMP software. This presentation addresses Hierarchical and K-Means methods, providing guidelines that will help you decide when each is appropriate. The K-Means portions will also include Self-Organizing Maps and Normal Mixtures. As with almost all analyses in JMP, visualizations are available to help you through the process.

CL

Count Series Forecasting

Many organizations need to forecast large numbers of time series that are discretely valued. These series, called count series, fall approximately between continuously valued time series, for which there are many forecasting techniques (ARIMA, UCM, ESM and others), and intermittent time series, for which there are a few forecasting techniques (Croston's method and others). This paper proposes a technique for large-scale automatic count series forecasting and uses SAS® Forecast Server software to demonstrate this technique.

SASGF15

Data Diagnostics in SAS® Enterprise Guide®

In this session we discuss doing data diagnostics for your analytical analysis. We cover how to describe data (descriptive statistics), graph the data, detect and deal with outliers, assess normality, transform variables in order to meet assumptions (transformations) and sample (for modeling purposes).

CL

Data Preparation Techniques for Data Mining in SAS® Enterprise Guide®

In this session we cover creating a data mart to be used for modeling. We start by discussing the data and data format needed for modeling. We then walk through an example in SAS Enterprise Guide by creating a target variable, creating model input variables from single or multiple variables, recoding variables, and subsetting the data to the cases of interest. The entire process is captured in a SAS Enterprise Guide Process Flow.

CL

Discovering Patterns in Transactional Data Using SAS® Enterprise Miner™

Learn how to discover patterns in transactional data using a subset of the Explore Nodes in SAS Enterprise Miner such as market basket analysis, link analysis and path analysis.

CL

Drilling for Deepwater Data: A Forensic Analysis of the Gulf of Mexico Deepwater Horizon Disaster

During the cementing and pumps-off phase, drilling operations need to know, in real time, about any loss of hydrostatic or mechanical well integrity. This phase involves not only big data, but high-velocity data. Today's state-of-the-art drilling rigs have tens of thousands of sensors. These sensors and their data output must be correlated and analyzed in real time. This paper shows you how to leverage SAS® Enterprise Miner™ time series nodes and survival analysis nodes to build a model for drilling and well-control anomalies, fingerprint key well-control measures such as flow out, and how to operationalize these analytics on the drilling assets with SAS Event Stream Processing. We cover the implementation and results from the Deepwater Horizon case study, demonstrating how SAS Analytics enables the rapid differentiation between safe and unsafe modes of operation.

SASGF15

Encore: Introduction to Bayesian Analysis Using SAS/STAT®

The use of Bayesian methods has become increasingly popular in modern statistical analysis, with applications in numerous scientific fields. In recent releases, SAS® has provided a wealth of tools for Bayesian analysis, with convenient access through several popular procedures, as well as the MCMC procedure, which is designed for general Bayesian modeling. This paper introduces the principles of Bayesian inference and reviews the steps in a Bayesian analysis. It then describes the built-in Bayesian capabilities provided in SAS/STAT, which became available for all platforms with SAS/STAT 9.3, with examples from the GENMOD and PHREG procedures. How to specify prior distributions, evaluate convergence diagnostics and interpret the posterior summary statistics are discussed.

SASGF15

Ensemble Models and Partitioning Algorithms in SAS® Enterprise Miner™

One strategy for potentially increasing model accuracy is ensemble models. In this session, various ensemble models will be presented based on partitioning algorithms in SAS Enterprise Miner, including decision trees, bagging, boosting, gradient boosting, random forests and ensemble trees.

CL

Equivalence and Noninferiority Testing Using SAS/STAT® Software

Proving difference is the point of most statistical testing. In contrast, the point of equivalence and noninferiority tests is to prove that results are substantially the same, or at least not appreciably worse. An equivalence test can show that a new treatment, one that is less expensive or causes fewer side effects, can replace a standard treatment. A noninferiority test can show that a faster manufacturing process creates no more product defects or industrial waste than the standard process. This paper reviews familiar and new methods for planning and analyzing equivalence and noninferiority studies in the POWER, TTEST and FREQ procedures. Techniques that are discussed range from Schuirmann's classic method of two one-sided tests (TOST) for demonstrating similar normal or lognormal means in bioequivalence studies, to Farrington and Manning's noninferiority score test for showing that an incidence rate (such as a rate of mortality, side effects or product defects) is no worse. Real-world examples from clinical trials, drug development and industrial process design are included.

SASGF15

Expediting Models Into Production

Understand how SAS® Model Manager speeds model production deployment and witness the solution's key capabilities and benefits of conducting model management, monitoring and reporting.

CL

Exploring and Modeling Using Interactive Decision Trees in SAS® Enterprise Miner™

Decision trees are a useful, multipurpose tool in a modeler's tool chest. Not only can decision trees be used for predictive modeling, but also for variable selection, variable importance, interaction detection, missing value imputation and model interpretation. In this session, we will discuss and illustrate how to take advantage of the decision tree tool in SAS Enterprise Miner, including interactive decision trees for exploration and modeling.

CL

Getting Started With SAS® Enterprise Miner™

Are you ready to jump into using SAS Enterprise Miner, but aren't sure how to get started? This presentation will walk through the basic steps to start you on your journey. Learn how to create a project, define a data source, create a basic process flow, explore data, modify data to overcome common data challenges, perform basic modeling, compare models, score new data and more.

CL

Getting Started With SAS® Text Miner

Are you ready to jump into using SAS Text Miner, but aren't sure how to get started? This presentation will walk through the basic steps to start you on your journey. Learn how to create a project, access and read unstructured data, perform natural language processing, explore concepts in your document collection, group similar documents and even use unstructured data for predictive modeling.

CL

Getting Started With SAS® Visual Statistics

You are a business analyst, statistician or data scientist responsible for data exploration and model creation, but you are new to SAS Visual Statistics. This presentation will show you what it is, the value that it provides, and its capabilities for visually exploring data using statistical modeling techniques. The presentation and accompanying demonstration will provide a preliminary view into the following components of SAS Visual Statistics:

- Getting to SAS Visual Statistics - from the Hub, SAS Visual Analytics both directly and from analysis graphs.
- Creating models - decision trees and logistic regression.
- Comparing models - looking at different criteria, including Lift, ROC and Misclassification.
- Score code - how to create score code and score new data. The goal of this session is to help you start using and deriving value from SAS Visual Statistics as quickly as possible.

CL

How to Select the Best Predictor Variables Using SAS® Enterprise Guide® and SAS® Enterprise Miner™

This presentation will answer the what, why and how on variable selection. What is variable selection (sometimes called variable reduction)? Why is it important, and why should it be on your list of activities when doing predictive modeling? How do you do variable selection using SAS Enterprise Guide and SAS Enterprise Miner? This presentation will include examples for both SAS products.

CL

Incorporating External Economic Scenarios Within Your CCAR Stress Testing Routines

Banks and bank holding companies in the United States have faced increased regulation following the financial crisis of 2008. A recent addition is the Comprehensive Capital Analysis and Review (CCAR), the core of which is a series of what-if or scenario analyses requirements that involve a number of scenarios provided by the Federal Reserve. This paper proposes frequentist and Bayesian time series methods to address this stress testing problem in a highly practical "top-down" fashion. The focus is on the value of using univariate and multivariate time series methods and on the methodology behind these models.

SASGF15

In-Depth Look at SAS® Rapid Predictive Modeler: The Science Behind the Curtain

SAS Rapid Predictive Modeler is a powerful tool to help data miners be even more productive. Would you like to see exactly what's happening behind the scenes? Discover the techniques used in SAS Rapid Predictive Modeler by examining step-by-step, or "node by node," how it applies the SEMMA process (Sample, Explore, Modify, Model and Assess) to your data to create models using proven data mining practices. All three model options, from basic to advanced, will be explored, and you'll also learn how you can take advantage of the resulting models in SAS® Enterprise Miner™.

CL

Introducing the HPGENSELECT Procedure: Model Selection for Generalized Linear Models

Generalized linear models are highly useful statistical tools in a broad array of business applications and scientific fields. How can you select a good model when numerous models that have different regression effects are possible? The HPGENSELECT procedure, which was introduced in SAS/STAT® 12.3, provides forward, backward and stepwise model selection for generalized linear models. You can specify common distributions in the generalized linear models family, such as the Poisson, binomial and multinomial distributions. You can also specify the Tweedie distribution, which is important in ratemaking by the insurance industry and in scientific applications. This paper shows you how to use the HPGENSELECT procedure both for model selection and for fitting a single model. The paper also explains the differences between the HPGENSELECT procedure and the GENMOD procedure.

SASGF15

Introduction to Data Mining and an Overview of SAS® Enterprise Miner™

What exactly is data mining and how can it help your organization more confidently predict the future? This presentation will introduce you to the essential aspects of data mining and give you a guided tour of SAS Enterprise Miner, the powerful data mining workbench from SAS.

CL

Introduction to SAS® Analytics Accelerator for Teradata

Want to improve your models' scalability and performance? Learn how the modeling methods of SAS® Enterprise Miner™, SAS/ETS® and SAS/STAT® can be deployed as scalable and massively parallel Teradata database operations. Discover the core set of SAS Analytics Accelerator's statistical and analytical in-database operations.

CL

Introduction to SAS® Forecast Server

This presentation walks through the eight-step wizard for setting up a new project and describes the interface and output generated.

CL

Introduction to SAS® Rapid Predictive Modeler

Whether you are a data miner wondering if there is a way to build predictive models faster or a business analyst wishing there were a way to build predictive models without being dependent on data miners every time, learn how SAS Rapid Predictive Modeler is a powerful tool to add to your workbench. SAS Rapid Predictive Modeler is a task in familiar interfaces: SAS® Enterprise Guide® and Microsoft Excel (via the SAS Add-In for Microsoft Office). It uses best practices to build models for you and surfaces the results in easy-to-interpret reports.

CL

Introduction to SAS® Scoring Accelerator for Teradata

Does putting your models into production involve numerous steps plus weeks or months of complex processes? Would your organization benefit from more nimble production model deployment? Learn how SAS Scoring Accelerator for Teradata translates scoring models created in SAS® Enterprise Miner™ and linear models created in SAS/STAT® into in-database operations. See how these models can be deployed into Teradata from a robust and rigorous model monitoring and lifecycle management approach.

CL

Logistic Regression: What Is It and What Can I Learn From It?

This tutorial is designed for someone who does not have a statistical background but may need to predict an outcome using logistic regression. This tutorial will answer the questions "What is a logistic regression?" and "What will I learn from running a logistic regression on my data?" In the session, simple examples will be used to show how to set up your data, run a logistic regression and interpret the output.

CL

Model Selection in SAS® Enterprise Guide® and SAS® Enterprise Miner™

This presentation will answer the what, why and how on model selection. We will take a look at criteria and techniques used for model selection. Why is it important? And why should it be on your list of activities when doing predictive modeling? How to do model selection using SAS Enterprise Guide and SAS Enterprise Miner? This presentation will include examples for both SAS products.

CL

Practical Applications of SAS® Simulation Studio

SAS Simulation Studio, a component of SAS/OR® software for Microsoft Windows environments, provides powerful and versatile capabilities for building, executing and analyzing discrete-event simulation models in a graphical environment. Its object-oriented, drag-and-drop modeling makes building and working with simulation models accessible to novice users, and a broad range of model configuration options and advanced capabilities makes SAS Simulation Studio suitable also for sophisticated, detailed simulation modeling and analysis. Although the number of modeling blocks in SAS Simulation Studio is small enough to be manageable, the number of ways in which they can be combined and connected is almost limitless. This paper explores some of the modeling methods and constructs that have proven most useful in practical modeling with SAS Simulation Studio. SAS has worked with customers who have applied SAS Simulation Studio to measure, predict and improve system performance in many different industries, including banking, public utilities, pharmaceuticals, manufacturing, prisons, hospitals and insurance. This paper looks at some discrete-event simulation modeling needs that occur in specific settings and some that have broader applicability, and it considers the ways in which SAS Simulation Studio modeling can meet those needs.

SASGF15

Predictive Modeling Using SAS® Visual Statistics: Beyond the Prediction

Predictions, including regressions and classifications, are the predominant focus of many statistical and machine-learning models. However, in the era of big data, a predictive modeling process contains more than just making the final predictions. For instance, a large collection of data often represents a set of small, heterogeneous populations. Identification of these subgroups is therefore an important step in predictive modeling. Additionally, big data data sets are often complex, exhibiting high dimensionality. Consequently, variable selection, transformation and outlier detection are integral steps. This paper provides working examples of these critical stages using SAS Visual Statistics, including data segmentation (supervised and unsupervised), variable transformation, supervised variable selection, outlier detection and filtering, in addition to building the final predictive model using methodology such as decision trees, logistic regressions and random forests. The illustration data is from 2010-2014 vehicle emission testing results.

SASGF15

Proven Practices for Predictive Modeling

In our ongoing quest for analytics excellence, what are some of the strategies and tactics that we as analytics practitioners can consider, not only for individual predictive modeling projects, but for increasing the value and importance of analytics in our organizations? This presentation will share some of the common strategies, attributes, processes and best practices of the most successful organizations. Best practices will include considerations for an overall analytics process, as well as the discrete steps of building a predictive model, such as: data preparation and sampling; input (variable) examination, selection and transformation; model selection and validation; and more.

CL

SAS® Does Data Science: Getting Certified as a Data Scientist

The Cloudera Data Science Challenge is a rigorous competition in which candidates must provide a solution to a real-world big data problem that surpasses a benchmark specified by some of the world's elite data scientists. This second-ever Cloudera Data Science Challenge involved detecting anomalies in the United States Medicare insurance system. Finding anomalous patients, procedures, providers and regions in the competition's large, complex and intertwined data sets required industrial-strength tools for data wrangling and machine learning. This paper shows how to get it done with SAS.

SASGF15

SAS/STAT® 14.1: Methods for Massive, Missing or Multifaceted Data

The latest release of SAS/STAT software brings you powerful techniques that will make a difference in your work, whether your data is massive, missing or somewhere in the middle. New imputation software for survey data adds to an expansive array of methods in SAS/STAT for handling missing data, as does the production version of the GEE procedure, which provides the weighted generalized estimating equation approach for longitudinal studies with dropouts. An improved quadrature method in the GLIMMIX procedure gives you accelerated performance for certain classes of models. The HPSPLIT procedure provides a rich set of methods for statistical modeling with classification and regression trees, including cross-validation and graphical displays. The HPGENSELECT procedure adds support for spline effects and lasso model selection for generalized linear models. And new software implements generalized additive models using an approach that handles large data easily. Other updates include key functionality for Bayesian analysis and pharmaceutical applications.

SASGF15

SAS® Model Manager: An Easy Way for Deploying SAS® Analytical Models to Databases and Hadoop

SAS Model Manager provides an easy way for deploying analytical models to various types of relational databases and to a Hadoop Distributed File System. There are two publishing methods that can be used: scoring functions and the SAS Embedded Process. This paper gives a brief introduction of both the SAS Model Manager publishing functionality and the SAS Scoring Accelerator. It describes the major differences between using the scoring function and the SAS Embedded Process publish methods to publish a model. The paper also explains how to use AS applications and SQL code outside of SAS to perform in-database processing of a published model. Along with Hadoop, the supported databases are Teradata, Oracle, Netezza, DB2 and SAP HANA. Samples are provided for publishing a model in one of the supported databases and Hadoop. After reading this paper, you should feel comfortable using a published model in your business environment.

SASGF15

SAS® University Edition: Connecting SAS® Software in New Ways to Build the Next Generation of SAS® Users

Are you a SAS user hoping to convince your organization to move to the latest release of the software? Has your management team asked how your organization can hire new SAS users familiar with the latest and greatest procedures and techniques? SAS Studio and SAS University Edition might provide the answers for you. SAS University Edition was created for teaching and learning. It's a new downloadable version of select SAS products (Base SAS, SAS/STAT®, SAS/IML®, SAS/ACCESS® Interface to PC Files and SAS Studio) that runs on Windows, Linux and Mac. Given the exploding demand for analytical talent, SAS launched this package to grow the next generation of SAS users. Part of the way we're helping grow that next generation of users is through the interface to SAS University Edition: SAS Studio. SAS Studio is a developmental web application for SAS that you access through your web browser and - since the release of 9.4M1 - is included in Base SAS at no additional charge. The connection between SAS University Edition and "commercial" SAS means it's easier than ever to use SAS for teaching, research and learning, from high schools to community colleges, universities and beyond. We'll talk about some successes adopting SAS University Edition in these areas to grow the next generation of users.

SASGF15

Sharing the Wealth: Suggestions for Sharing and Documenting Data Mining Content Developed in SAS® Enterprise Miner™

In addition to an unmatched suite of modeling techniques and algorithms, there are many features in SAS Enterprise Miner designed to help you share and document the content you create using this solution. Topics include making your projects accessible to colleagues; making your champion models accessible to other people and applications; generating reports; and even creating snapshots of your work.

CL

Show Me the Money! Text Analytics for Decision Making in Government Spending

Understanding organizational trends in spending can help overseeing government agencies make appropriate modifications in spending to best serve the organization and the citizenry. However, given millions of line items for organizations annually, including freeform text, it is unrealistic for these overseeing agencies to succeed by utilizing only a manual approach to this textual data. Using a publicly available data set, this paper explores how business users can apply text analytics using SAS® Contextual Analysis to assess trends in spending for particular agencies, apply subject matter expertise to refine these trends into a taxonomy, and, ultimately, categorize the spending for organizations in a flexible, user-friendly manner. SAS Visual Analytics enables dynamic exploration, including modeling results from SAS Visual Statistics, in order to assess areas of potentially extraneous spending, providing actionable information to the decision makers.

SASGF15

Solving a Business Problem With SAS/QC® and SAS® Enterprise Guide®

SAS can conduct sophisticated analytics using statistical process control techniques so you can improve the quality of your products and services and maintain consistent quality standards across the enterprise. If you know little about statistical process control and want to learn more about analytics and SAS Enterprise Guide, you'll want to hear this presentation.

CL

10 Tips for Simulating Data With SAS®

Data simulation is a fundamental tool for statistical programmers. SAS software provides many techniques for simulating data from a variety of statistical models. However, not all techniques are equally efficient or effective. An efficient simulation can run in seconds, whereas an inefficient simulation might require days to run. An effective method produces an accurate statistical result, whereas an ineffective technique does not. This paper presents 10 techniques that will make your SAS simulations both efficient and effective.

SASGF15

Using R in SAS® Enterprise Miner™

Learn how to incorporate R models in SAS Enterprise Miner using the Open Source Integration Node.

CL

Using SAS/STAT®: A Gentle Introduction to Some Frequently Used Tools

Frequently, business interventions are evaluated by comparing two groups with respect to some outcome measures. For example, we might want to compare customers who received a marketing campaign with customers who did not receive the campaign, with respect to whether they bought additional products or services, quantity of a product purchased or other measures. We might need to compare two, or more than two, groups of customers, and the outcome measure(s) might be dichotomous (e.g., product buy-up vs. no buy-up) or continuous (e.g., quantity of a product purchased) with a variety of distributions. SAS/STAT provides several easy-to-use tools for such analytic situations, including PROC FREQ (chi-square tests, Fisher's exact test), PROC TTEST and PROC NPAR1WAY. This presentation will cover some of the tests most frequently used in the types of analytic situations outlined above. We will cover basic guidelines for using different tests and provide examples. This presentation is intended as an introduction for SAS users with a minimal statistics background.

CL

Using SAS® Enterprise Guide® to Prepare Data for SAS® Enterprise Miner™

SAS Enterprise Guide contains many useful tools to help you prepare data for data mining. Learn what data structures are used for data mining and how to create them by joining tables, summarizing data, creating derived variables, transposing data, checking quality and performing preliminary data exploration.

CL

Using SAS® Text Analytics to Examine Internet-Based Sources for Patient Labor and Delivery Preferences

In today's society, where seemingly unlimited information is located just a single click away, many women turn to social media, message forums and medical websites to research and understand how expectant mothers feel about the birthing process. Mining the opinions of both patients and experts helps provide an understanding of what people value and how they feel. This paper shows the use of SAS Text Analytics to gather, explore and analyze reports from patients, medical experts and other relevant sources to determine their sentiment about labor and delivery topics. Results of this analysis drive the design and development of a survey that will be used to understand what characteristics of the birthing process yield the highest levels of importance.

SASGF15

Using Structural Equation Modeling in PROC CALIS to Analyze Longitudinal Data

Researchers often use longitudinal data analysis to study the development of behavior or traits. For example, they might use longitudinal data analysis to study how elderly people's cognitive functioning changes over time or how elementary students' IQs affect their math and reading. In the fields of statistics and biostatistics, two popular and well-known approaches to longitudinal data analysis are marginal models and mixed-effects models. A lesser-known approach is based on structural equation modeling, which has been proposed in the field of psychometrics and has been widely applied by social scientists. The structural equation modeling approach enjoys some unique advantages in analyzing longitudinal data. For example, it incorporates latent variables in the modeling so that it can handle high-dimensional longitudinal data with relative ease. Other features of structural equation modeling, such as multiple-group analysis, might also open new paths for longitudinal research. This paper uses the CALIS procedure in SAS/STAT® software to introduce the structural equation modeling approach to longitudinal data analysis. Examples illustrate the unique features of the structural equation modeling approach and show how to set up corresponding structural equation models in the CALIS procedure.

SASGF15

Using Text Analytics to Analyze E-Cigarette Trends and Categorize Twitter Data

A leading killer in the United States is smoking and, moreover, more than 8.6 million Americans live with a serious illness caused by smoking or secondhand smoking. Despite this, more than 46.6 million US adults smoke tobacco, cigars and pipes. The key analytic question in this paper is, "How would e-cigarettes affect this public health situation?" Can monitoring public opinions of e-cigarettes using SAS® Text Analytics and SAS Visual Analytics help provide insight into the potential dangers of these new products? Are e-cigarettes an example of Big Tobacco up to its old tricks or, in fact, a cessation product? The research in this paper was conducted on thousands of tweets from April to August 2014. It includes API sources beyond Twitter - for example, indicators from the Health Indicators Warehouse (HIW) of the Centers for Disease Control and Prevention (CDC) - that were used to enrich Twitter data in order to implement a surveillance system developed by SAS for the CDC. The analysis is especially important to the Office of Smoking and Health (OSH) at the CDC, which is responsible for tobacco control initiatives that help states to promote cessation and prevent initiation in young people. To help the CDC succeed with these initiatives, the surveillance system also: 1) automates the acquisition of data, especially tweets; and 2) applies text analytics to categorize these tweets using a taxonomy that provides the CDC with insights into a variety of relevant subjects. Twitter text data can help the CDC look at the public response to the use of e-cigarettes and examine general discussions regarding smoking and public health, and potential controversies (involving tobacco exposure to children, increasing government regulations and so on). SAS Content Categorization helps health care analysts review large volumes of unstructured data by categorizing tweets in order to monitor and follow what people are saying and why they are saying it. Ultimately, it is a solution intended to help the CDC monitor the public's perception of the dangers of smoking and e-cigarettes; in addition, it can identify areas where OSH can focus its attention in order to fulfill its mission and track the success of CDC health initiatives.

SASGF15

Using the OPTMODEL Procedure in SAS/OR® to Solve Complex Problems

Mathematical optimization is a powerful paradigm for modeling and solving business problems that involve interrelated decisions about resource allocation, pricing, routing, scheduling and similar issues. The OPTMODEL procedure in SAS/OR software provides unified access to a wide range of optimization solvers and supports both standard and customized optimization algorithms. This paper illustrates PROC OPTMODEL's power and versatility in building and solving optimization models and describes the significant improvements that result from PROC OPTMODEL's many new features. Highlights include the recently added support for the network solver, the constraint programming solver and the COFOR statement, which allows parallel execution of independent solver calls. Best practices for complex problems that require access to more than one solver are also demonstrated.

SASGF15

Using the PHREG Procedure to Analyze Competing-Risks Data

Competing risks arise in studies in which individuals are subject to a number of potential failure events and the occurrence of one event might impede the occurrence of other events. For example, after a bone marrow transplant, a patient might experience a relapse or might die while in remission. You can use some standard methods of survival analysis, such as the log-rank test and the Cox regression, to analyze competing-risks data, whereas other methods, such as the product-limit estimator, might yield biased results. An increasingly common practice of assessing the probability of a failure in competing-risks analysis is to estimate the cumulative incidence function, which is the probability subdistribution function of failure from a specific cause. This paper discusses two commonly used regression approaches for evaluating the relationship of the covariates to the cause-specific failure in competing-risks data. One approach models the cause-specific hazard, and the other models the cumulative incidence. The paper shows how to use the PHREG procedure in SAS/STAT® to fit these models.

SASGF15

Using the SSM Procedure to Analyze Hierarchical Longitudinal Data

In many studies, the interest lies in analyzing noisy curves that are generated because of repeated measurements over time on several subjects. The subjects are often grouped into different categories, such as cases and controls. This paper describes how you can use an approach that is based on the state space model to analyze such hierarchical longitudinal data. In this approach, the subject curves are modeled semiparametrically as a sum of covariate effects and curves that are associated with group means, treatment effects and subject-specific deviations. State space modeling enables you to treat the different summands in the model as suitable nonparametric curves. This paper introduces continuous-time state space models that apply to such data and presents several real-life illustrative examples. These examples show how you can test a variety of research hypotheses about the effect curves and their contrasts, select and diagnose a model, and interpolate and extrapolate the effect curves. In addition, the merits of the state space model approach are compared with other approaches. All the analyses are carried out by using PROC SSM, a state space modeling procedure in SAS/ETS® software.

SASGF15

What's New for Analytics in SAS® 9.4?

Many new analytical enhancements and procedures have been added for SAS 9.4 analytical products, including Base SAS, SAS/STAT®, SAS/ETS®, and SAS® Enterprise Miner™. This session not only covers the new additions, but also provides examples.

CL

What's New in SAS® Enterprise Miner™

Learn about the changes and enhancements to SAS® Enterprise Miner™ 13.2 running on SAS 9.4, including new industry-specific tools and new techniques to help you derive even more benefits from your data mining efforts.

CL

What's New in SAS® Forecast Server

This session highlights all the new features in version 13.2 of SAS Forecast Server.

CL

Working With Panel Data: Extracting Value From Multiple Customer Observations

Many retail and consumer packaged goods (CPG) companies are now keeping records of what customers purchased in the past, often through some form of loyalty program. This recording is one example of how modern corporations are building data sets that have a panel structure, a data structure that is also pervasive in insurance and finance organizations. Panel data (sometimes called longitudinal data) can be thought of as the joining of cross-sectional and time series data. Panel data enables analysts to control for factors that cannot be considered by simple cross-sectional regression models that ignore the time dimension. These factors, which are unobserved to the modeler, might bias regression coefficients if they are ignored. This paper compares several methods for working with panel data in the PANEL procedure and discusses how you might benefit from using multiple observations for each customer. Sample code will be made available.

SASGF15

Make Better Decisions With Optimization

Automated decision-making systems are now found everywhere, from your bank to your government to your home. For example, when you inquire for a loan through a website, a complex decision process likely runs combinations of statistical models and business rules to make sure you are offered a set of options for tantalizing terms and conditions. To make that happen, analysts diligently strive to encode their complex business logic into these systems. But how do you know if you are making the best possible decisions? How do you know if your decisions conform to your business constraints? For example, you might want to maximize the number of loans that you provide while balancing the risk among different customer categories. Welcome to the world of optimization. SAS® Business Rules Manager and SAS/OR® software can be used together to manage and optimize decisions. This presentation demonstrates how to build business rules and then optimize the rule parameters to maximize the effectiveness of those rules. The end result is more confidence that you are delivering an effective decision-making process.

SASGF15

Bayesian Analysis of Item Response Theory Models Using SAS®

Written especially for psychometricians, scale developers and practitioners interested in applications of Bayesian estimation and model checking of item response theory (IRT) models, this book teaches you how to accomplish all of this with the SAS MCMC procedure. Because of its tutorial structure, Bayesian Analysis of Item Response Theory Models Using SAS will be of immediate practical use to SAS users with some introductory background in IRT models and the Bayesian paradigm. Working through this book's examples, you will learn how to write the PROC MCMC programming code to estimate various simple and more complex IRT models, including the choice and specification of prior distributions, specification of the likelihood model and interpretation of results. Specifically, you will learn PROC MCMC programming code for estimating particular models and ways to interpret results that illustrate convergence diagnostics and inferences for parameters, as well as results that can be used by scale developers - for example, the plotting of item response functions. In addition, you will learn how to compare competing IRT models for an application, as well as evaluate the fit of models with the use of posterior predictive model checking methods. Numerous programs for conducting these analyses are provided and annotated so that you can easily modify them for your applications.

SASPRS

A Brief History of Stationarity Testing

One of the most important concepts in time series analysis is stationarity. If a process is stationary, then estimators and forecasts have rather standard distributional properties, while nonstationary series have rather unusual (and sometimes disappointing) properties. This raises the question of how to tell whether a series is stationary or not. Perhaps the most commonly used test to make this decision is that due to Dickey and Fuller. In this talk I will not only give some examples to illustrate how this test is used, but also talk a little about the original development of the test, including a look at the state of computing in the mid-1970s, when the research leading up to the test was done.

SASPRS

Building Better Models With JMP® Pro

Building Better Models With JMP Pro provides an example-based introduction to business analytics, with a proven process that guides you in the application of modeling tools and concepts. It gives you the what, why and how of using JMP Pro for building and applying analytic models. This book is designed for business analysts, managers and practitioners who may not have a solid statistical background but need to be able to readily apply analytic methods to solve business problems. In addition, this book will greatly benefit faculty members who teach any of the following subjects at the lower to upper graduate level: predictive modeling, data mining and business analytics. Novice to advanced users in business statistics, business analytics and predictive modeling will find that it provides a peek inside the black box of algorithms and the methods used. Topics include: regression, logistic regression, classification and regression trees, neural networks, model cross-validation, model comparison and selection, and data reduction techniques. Full of rich examples, this is an applied book on business analytics and modeling that introduces a simple methodology for managing and executing analytics projects. No prior experience with JMP is needed.

SASPRS

Analytics: Data Mining/Text Analytics

Building Customer Lifetime Value Models in the Insurance Industry

This presentation provides advice in using SAS® Enterprise Miner™ to build customer lifetime value models in the insurance industry. Specifically, it addresses best practices and techniques for applying the principles of discrete survival data mining.

CES

Case Study on Voice of Customer Using Text Analytics

Quality issues can easily go undetected in the field for months, even years. Why? Customers are more likely to complain through their social networks than directly through customer service channels. Customer complaints are often handled by marketing or customer service and aren't shared with engineering. What if we could infuse the voice of the customer directly into engineering and detect emerging issues months earlier than your existing process? This presentation describes a partnership between a company and SAS to build an end-to-end process that comprises data acquisition and preparation, analysis using linguistic text analytics models, and quality control metrics for visualization dashboards. These reports are consumed by the company's executives to help them make informed decisions. In this discussion, we'll go into great detail talking about perceptual quality, where to look for it and why we should care about it. We will also talk about best practices for starting your own perceptual quality program through voice of customer analytics.

CES

Analytics: Data Transparency/Quality Improvements

A Systematic and Novel Approach to Biological Surveillance

At the request of the Department of Homeland Security, a system was developed to alert on outbreaks of both naturally and unnaturally occurring health threats. Using medical data from emergency management systems, emergency departments, poison centers and Google search, a "web of analytics" was developed, enabling alerts to impending health-related issues to be surfaced much sooner than had been thought possible. This presentation describes this new system of biological surveillance that exploits the worlds of health care professionals and considers the severity of cases and even the component relationships between data elements to achieve timely, significant and noise-free results.

CES

Analytics: Forecasting/Econometrics

SAS® Forecasting Implementation in an Agile Framework

Industries are increasingly embracing an agile framework for services projects. Some aspects of forecasting projects, such as data acquisition and quality control, are sequential and pose challenges when approached with an agile methodology. Other aspects, like iterative model improvements, lend themselves much more easily to an agile approach. We discuss the challenges and rewards of an agile approach to forecasting projects and share best practices for success.

CES

Analytics: Predictive Modeling

SAS® Asset Performance Analytics Use Cases and Implementation Best Practices

Managing and analyzing sensor data after a failure occurs can make you feel like you're looking for a needle in a haystack. Learn how SAS Asset Performance Analytics is implemented to manage thousands of sensor variables, maintenance reports and operator logs; detect predictive failure patterns; and alert nonstable, nonoptimized operations. We will discuss best practices used to predict and prevent future disruptive events and to extend analytical knowledge and insights across an organization, from the shop floor to C-level suites.

CES

Using a Model Factory Approach to Predictive Modeling

What should you do when you have more predictive models to build than you have modelers to build them? A model factory approach uses SAS® High-Performance Analytics to satisfy the need to deliver many models with different targets and different subsets of data. This presentation discusses a factory approach to the analytical life cycle, from data preparation through model development, deployment and monitoring. The discussion reviews preparing data, building a variety of models using SAS High-Performance Analytics, and how to manage, publish and score models using SAS Model Manager and SAS Scoring Accelerator.

CES

Cardinality Reduction for Improved Predictive Modeling and Clustering

This presentation demonstrates the function, speed of processing and ease of use of the macro-driven cardinality reduction method, which enables higher predictive power for categorical variables in predictive modeling and improved use of categorical variables in k-means clustering. Detailed SAS® code is provided to implement the cardinality reduction method.

CES

Fundamentals of Predictive Analytics With JMP®

Fundamentals of Predictive Analytics With JMP bridges the gap between courses on basic statistics, which focus on univariate and bivariate analysis, and courses on data mining/predictive analytics. This book provides the technical knowledge and problem-solving skills needed to perform real data multivariate analysis. Utilizing JMP 10 and JMP Pro, this book offers new and enhanced resources, including an add-in to Microsoft Excel, Graph Builder and data mining capabilities. Written for students in undergraduate and graduate statistics courses, this book first teaches students to recognize when it is appropriate to use the tool, to understand what variables and data are required, and to know what the results might be. Second, it teaches them how to interpret the results, followed by step-by-step instructions on how and where to perform and evaluate the analysis in JMP. With the new emphasis on business intelligence, business analytics and predictive analytics, this book is invaluable to everyone who needs to expand their knowledge of statistics and apply real problem-solving analysis.

SASPRS

Analytics: Statistics/Biostatistics

CSI: Customer Segmentation Intelligence for Increasing Profits

What will your customer do next? Customers behave differently; they are not all average. Can you simultaneously meet your customers' needs and improve profitability? You can by communicating and providing better offers to customers based on their behavior and demographics. Segmentation gives you the ability to group customers in many ways: 1) business rules; 2) supervised clustering – decision trees, and so on; 3) unsupervised clustering; and 4) creating segments based on quantile membership. Which one works? That depends on two factors: the business goal and customer attributes. Do you want to increase share of wallet, market share, customer satisfaction or all three? This presentation covers roles played by business issues and available data, and which SAS segmentation technique is appropriate for particular situations.

CES

Business Intelligence/Business Analytics

An Introduction to the ODS Graphics Designer and the Graph Template Language (GTL)

Introduced in SAS® 9.2, new graphics templates are part of ODS Statistical Graphics. This session introduces the Graph Template Language (GTL) and a new graphical interface to create graphics templates, the ODS Graphics Designer.

CL

Around the World With PROC GEOCODE

Geocoding is the process of adding geographic coordinates (latitude and longitude values) to an address. After geocoding, the coordinates can be used to display a point on a map or to calculate distances. Geocoding also enables you to add attribute values such as census blocks to an address. This presentation will cover the various geocoding methods, PROC GEOCODE syntax and the associated data sources.

CL

Configuring a SAS® Business Intelligence (BI) Client With a SAS® Server to Support Multilingual Data

As business has become increasingly global, more and more companies are processing multilingual data. In order for a SAS Business Intelligence client to support this type of data successfully, the language environment must be configured correctly between the SAS client and the SAS server. Proper configuration includes the correct setting of the locale on the client side and the encoding on the server side. This presentation, intended for SAS users and SAS administrators, introduces several methods for configuring an ideal and effective multilingual working environment for SAS clients such as SAS® Enterprise Guide®, SAS Data Integration Studio, and SAS® Enterprise Miner™. Of particular interest is a unique approach to setting a SAS Workspace Server to different encoding values on a per-user basis. Each method's advantages and disadvantages are detailed, along with an example scenario that shows when the method is best used. In the presentation, SAS Enterprise Guide 7.1 and a SAS 9.4 unicode server are used as examples. In addition, the presentation addresses SAS servers in both Microsoft Windows and UNIX operating environments for each method that is discussed.

OTH

Creating and Deploying SAS® Stored Processes

SAS Stored Processes enable you to run a SAS program and view the results in many different types of SAS applications and business intelligence clients. This session provides information on how to create, design and run stored processes from SAS tasks, SAS® Enterprise Guide® projects and existing SAS program code.

CL

Deep Dive on SAS® Enterprise Guide® Reporting

Learn how to create diverse reports ranging from simple observation and variable listings to prompted stored processes. Combining reports in the report builder is also illustrated.

CL

Gaining Efficiencies in SAS® Enterprise Guide®

Uncertain how to gain more efficiencies from SAS Enterprise Guide or how to structure your projects? This presentation covers some key tips for organizing your SAS Enterprise Guide projects, including:

- Factors to consider when designing SAS Enterprise Guide projects.
- Ordering and arranging your work.
- Techniques for reducing data volumes and minimizing network traffic.

CL

Graphing With SAS® Enterprise Guide®

SAS Enterprise Guide offers many types of graphics. This session discusses and shows many examples of SAS Enterprise Guide graphics tasks via point and click.

CL

Hidden Gems in SAS® Enterprise Guide®

SAS Enterprise Guide is much more than a point-and-click interface to SAS. This session looks at both new and existing functionality to help the novice user and the longtime programmer, including: task templates, code templates, conditions in a process flow, ordered lists, filters in tasks, prompted filters, computed columns, subqueries, adding SAS code to a process flow and creating stored processes from SAS code.

CL

Introduction to JMP®

This presentation includes a description of the interface, accessing data, creating interactive graphics, performing analysis and sharing output. It also covers available resources for gaining additional information about JMP.

CL

Introduction to SAS® Customer Intelligence Studio

SAS Customer Intelligence Studio enables business users to build and execute marketing campaigns using a graphical flow. This demonstration is intended for those who are new to SAS Customer Intelligence Studio. It walks through the basic campaign steps, from completing the campaign brief, to selecting and segmenting the audience, to delivering the contact details to multiple channels.

CL

Introduction to SAS® Add-In for Microsoft Office

The SAS Add-In for Microsoft Office provides transparent access to SAS from Microsoft Office applications. It enables you to run sophisticated SAS analyses on large SAS data sources while working in the familiar Microsoft Office environment. This session will illustrate how to view and run stored processes, query data and run SAS tasks using the SAS Add-In for Microsoft Office.

CL

Introduction to SAS® Information Delivery Portal

The SAS Information Delivery Portal delivers information in a targeted and customized way. It provides a single access point for aggregated information via an easy-to-use, web-based interface. This session illustrates how to organize content into portlets and pages within the SAS Information Delivery Portal (could include dashboards as well).

CL

Mapping Using SAS® Enterprise Guide® and SAS/GRAPH® Code

The map chart task in SAS Enterprise Guide allows for the creation of maps using one response variable. Maps are created using the SAS supplied MAP data sets or map data supplied by your organization. This session covers the map chart task and how to enhance a simple map using SAS code, as well as basics involved in SAS mapping.

CL

Overview of SAS® Web Report Studio

SAS Web Report Studio empowers business users and decision makers across the enterprise by providing fast, simple access to query and reporting capabilities on the web. This session shows how to build reports using SAS Web Report Studio.

CL

SAS® Visual Analytics Tips and Tricks for Users

This session is for business users or analysts who have started using SAS Visual Analytics for data exploration and/or report design and could benefit from tips, tricks and best practices from more experienced users.

CL

The Top 3 Things SAS® Programmers Should Know About SAS® Enterprise Guide®

Are you a seasoned SAS programmer? Are you a bit hesitant about this interface called SAS Enterprise Guide? This discussion focuses on questions that SAS programmers might have about SAS Enterprise Guide, such as: Can I still use my SAS code? Are there tasks that are easier with SAS Enterprise Guide? And more!

CL

Tips and Tricks for JMP®

This session covers customizing JMP, interacting with data and customizing reports and graphs.

CL

What's New in JMP®

Learn about all the enhancements in JMP 11, including enhanced data visualization, control chart builder and many other new features.

CL

What's New in SAS® ODS Graphics

This session explores the new graphical capabilities available directly from many existing SAS procedures and the new SG procedures. Also, learn more about what's new in ODS Graphics, including the ODS Graphics Designer, the ODS Graphics Editor and the Graph Template Language. Updated to include SAS 9.3 changes.

CL

What's New in SAS® Add-In for Microsoft Office

The SAS Add-In for Microsoft Office provides transparent access to SAS from Microsoft Office applications. It enables you to run sophisticated SAS analyses on large SAS data sources while working in the familiar Microsoft Office environment. This session addresses the changes to SAS Add-In for Microsoft Office.

CL

What's New in SAS® Enterprise Guide®

SAS Enterprise Guide is a point-and-click, menu- and wizard-driven tool enabling data analysis and results publishing. This session addresses how SAS Enterprise Guide has changed in the current release.

CL

What's New in the SAS® Business Intelligence Clients

SAS® Enterprise BI Server provides an integrated, complete portfolio of BI capabilities. This session will address how the SAS Business Intelligence client applications have changed in SAS Enterprise BI. It covers what's new in the SAS Add-In for Microsoft Office, SAS® Enterprise Guide®, SAS Web Report Studio, SAS Information Delivery Portal and SAS BI Dashboard.

CL

You Want ME to Use SAS® Enterprise Guide®?

Starting with SAS®9, one copy of SAS Enterprise Guide is included with each PC SAS license. At some sites, desktop PC SAS licenses are being replaced with a single server-based SAS license and desktop versions of SAS Enterprise Guide. This presentation will introduce you to SAS Enterprise Guide and provide you with some good reasons why you should consider using it.

OTH

Find What You Are Looking for and More in SAS® Enterprise Guide®

Are you looking to track changes to your SAS programs? Do you wish you could easily find errors, warnings and notes in your SAS logs? Looking for a convenient way to find point-and-click tasks? Want to search your SAS Enterprise Guide project? How about a point-and-click way to view SAS system options and SAS macro variables? Or perhaps you want to upload data to the SAS® LASR™ Analytic Server, view SAS Visual Analytics reports, or run SAS Studio tasks, all from within SAS Enterprise Guide? You can find these capabilities and more in SAS Enterprise Guide. Knowing what tools are at your disposal and how to use them will put you a step ahead of the rest. Come learn about some of the newer features in SAS Enterprise Guide 7.1 and how you can leverage them in your work.

SASGF15

How SAS Uses SAS® to Analyze SAS Blogs

SAS blogs (hosted at blogs.sas.com) attract millions of page views annually. With hundreds of authors, thousands of posts and constant chatter within the blog comments, it's impossible for one person to keep track of all of the activity. In this paper, you'll learn how SAS technology is used to gather data and report on SAS blogs from the inside out. The beneficiaries include personnel from all over the company, including marketing, technical support, customer loyalty and executives. The author describes the business case for tracking and reporting on the activity of blogging. You'll learn how SAS tools are used to access the WordPress database and how to create a "blog data mart" for reporting and analytics. The paper includes specific examples of the insight that you can gain from examining the blogs analytically, and which techniques are most useful for achieving that insight. As an example, the blog transactional data is combined with social media metrics (also gathered by using SAS) to show which blog entries and authors yield the most engagement on Twitter, Facebook and LinkedIn. In another example, we identified the growing trend of "blog comment spam" on the SAS blog properties and measured its cost to the business. These metrics helped to justify the investment in a solution. Many of the tools used are part of SAS Foundation, including SAS/ACCESS®, the DATA step and SQL, PROC REPORT, PROC SGPLOT and more. The results are shared in static reports, automated daily email summaries, dynamic reports hosted in SAS/IntrNet®, and even a corporate dashboard hosted in SAS Visual Analytics.

SASGF15

Meter Data Analytics: Enabling Actionable Decisions to Derive Business Value From Smart Meter Data

A utility's meter data is a valuable asset that can be daunting to leverage. Consider that one household or site can produce more than 35,000 rows of information, consisting of more than 8MB of data per year. Thirty thousand meters collecting 15-minute-interval data with 40 variables equates to 1.2 billion rows of data. Using SAS® Visual Analytics, we provide examples of leveraging smart meter data to address business around revenue protection, meter operations and customer analysis. Key analyses include identifying consumption on inactive meters, potential energy theft, and stopped or slowing meters; and support of all customer classes (for example, residential, small commercial and industrial) and their data with different time intervals and frequencies.

SASGF15

One Report, Many Languages: Using SAS® Visual Analytics 7.1 to Localize Your Reports

Use SAS to communicate with your colleagues and customers anywhere in the world, even if you do not speak the same language! In today's global economy, most of us can no longer assume that everyone in our company has an office in the same building, works in the same country or speaks the same language. While it is vital to quickly analyze and report on large amounts of data, we must present our reports in a way that our readers can understand. New features in SAS Visual Analytics 7.1 give you the power to generate reports quickly and translate them easily so that your readers can comprehend the results. This paper describes how SAS Visual Analytics Designer 7.1 delivers THE POWER TO KNOW® in the language preferred by the report reader!

SASGF15

Row-Level Security and SAS® Visual Analytics

How can you make your data even more secure, considering the challenges of data security in today's business environment? SAS has implemented security features in its widely used business intelligence platform. A metadata-based authorization layer allows you to manage access to almost any metadata object. It supplements protections from the host environment and other systems. Throughout this paper, we discuss metadata-based authorizations, more specifically, access to a subset of a protected resource, when row-level security comes into play. Row-level capability specifies who can access particular rows within a table. This is an additional refinement of control that defines access to data at a more granular level. This paper demonstrates row-level security in SAS Visual Analytics.

SASGF15

Sankey Diagrams in SAS® Visual Analytics

Before the Internet era, you might not have come across many Sankey diagrams. These diagrams, which contain nodes and links (paths) that cross, intertwine and have different widths, were named after Capt. Matthew Sankey. He first created this type of diagram to visualize steam engine efficiency. Sankey diagrams used to have very specialized applications, such as mapping out energy, gas, heat or water distribution and flow, or cost budget flow. These days, it's become very common to display the flow of web traffic or customer actions and reactions through Sankey diagrams as well. Sankey diagrams in SAS Visual Analytics easily enable users to create meaningful visualizations that represent the flow of data from one event or value to another. In this paper, we take a look at the components that make up a Sankey diagram: 1) nodes, 2) links, 3) drop-off links and 4) a transaction. In addition, we look at a practical example of how Sankey diagrams can be used to evaluate web traffic and influence the design of a website. We use SAS Visual Analytics to demonstrate the best way to build a Sankey diagram.

SASGF15

SAS® Visual Analytics for Fun and Profit: A College Football Case Study

SAS Visual Analytics is a powerful tool for exploring, analyzing and reporting on your data. Whether you understand your data well or are in need of additional insights, SAS Visual Analytics has the capabilities you need to discover trends, see relationships and share the results with your information consumers. This paper presents a case study applying the capabilities of SAS Visual Analytics to NCAA Division I College Football data from 2005 through 2014. It follows the process from reading raw comma-separated values (CSV) files through processing that data into SAS data sets, doing data enrichment, and finally loading the data into in-memory SAS® LASR™ tables. The case study then demonstrates using SAS Visual Analytics to explore detailed play-by-play data to discover trends and relationships, as well as to analyze team tendencies to develop game-time strategies. Reports on player, team, conference and game statistics can be used for fun (by fans) and for profit (by coaches, agents and sportscasters). Finally, the paper illustrates how all of these capabilities can be delivered via the web or to a mobile device - anywhere - even in the stands at the stadium. Whether you are using SAS Visual Analytics to study college football data or to tackle a complex problem in the financial, insurance or manufacturing industry, SAS Visual Analytics provides the power and flexibility to score a big win in your organization.

SASGF15

Statistics for Gamers: Using SAS® Visual Analytics and SAS® Visual Statistics to Analyze World of Warcraft Logs

Video games used to be child's play. Today, millions of gamers of all ages kill countless in-game monsters and villains every day. Gaming is big business, and the data it generates is even bigger. Massive multiplayer online games like World of Warcraft by Blizzard Entertainment not only generate data that organizations can use to monitor users and their environments, but also produce client-side player data and combat logs. Many users spend time analyzing their playing "rotations" and use the information to adjust their playing style to deal more damage or, more appropriately, to heal themselves and other players. This paper explores World of Warcraft logs by using SAS Visual Analytics and applies statistical techniques by using SAS Visual Statistics to discover trends.

SASGF15

Take Your Data Analysis and Reporting to the Next Level by Combining SAS® Office Analytics, SAS® Visual Analytics and SAS® Studio

SAS Office Analytics, SAS Visual Analytics and SAS Studio provide excellent data analysis and report generation. When these products are combined, their deep interoperability enables you to take your analysis and reporting to the next level. Build interactive reports in SAS Visual Analytics Designer, and then view, customize and comment on them from Microsoft Office and SAS® Enterprise Guide®. Create stored processes in SAS Enterprise Guide, and then run them in SAS Visual Analytics Designer, tablets or SAS Studio. Run your SAS Studio tasks in SAS Enterprise Guide and Microsoft Office using data provided by those applications. These interoperability examples, and more, will enable you to combine and maximize the strength of each of the applications. Learn more about this integration between these products and what's coming in the future in this session.

SASGF15

Trade-Based Money Laundering

Trade-Based Money Laundering: The Next Frontier in International Money Laundering Enforcement is a timely, user-friendly guide that sheds light on shadowy and complex components of international trade fraud and its relationship to criminal and commercial money laundering, underground financial systems, and various forms of value transfer and capital flight. Financial compliance officers and law enforcement professionals will gain from unique insights and turn to the rare advice inside this book again and again to improve their analytic and investigative skills. A wealth of international case studies and illustrative diagrams bring to life the practical ways criminals and their accomplices transfer value through international markets. Written by a former federal agent who had firsthand interactions with players in international black-market financial systems, this accessible tool offers the author's cutting-edge plan to leverage data and analytics to discover TBML; an eye-opening discussion about the magnitude of the problem; go-to checklists, cheat sheets and bulleted advice for speeding along and improving the effectiveness of investigations; more than three dozen concrete red-flag indicators of TBML; a discussion of how legitimate businesses use forms of TBML to maximize profits and minimize taxes; a straightforward explanation of underground financial systems such as the black-market peso exchange, hawala and Chinese flying money and their link to TBML; and a convenient money-laundering primer to get you up to speed for advanced discussions.

SASPRS

Data Management

Array, Hurray, Array: Consolidate or Expand Your Input Data Stream Using Arrays

You have an input file with one record per month, but need a file with one record per year. But you cannot use PROC TRANSPOSE because other fields need to be retained or the input file is sparsely populated. The techniques shown here enable you to either consolidate or expand your output data using arrays. Sorted files of data records can be processed as a unit using "BY Variable" groups and building an array of records to process. This technique allows access to all of the data records for a BY variable group and gives the programmer access to the first, last and all records in between at the same time. This will allow the selection of any data value for the final output record.

SASPRS

The Little Engine That Could: Using EXCEL LIBNAME Engine Options to Enhance Data Transfers Between SAS® and Microsoft Excel Files

Many people are not aware that the SAS/ACCESS® Interface to PC Files product will allow SAS programmers to access an Excel spreadsheet in much the same way as any other SAS file. There are of course some restrictions, but there are also a lot of options that help remove some of the bumps in the road. The LIBNAME statement allows the user to define an Excel file in SAS terms and gives the programmer access to LIBNAME and data set options to control how the Excel file is defined, accessed and, yes, even how the data will be formatted. This paper will describe some of those options.

SASPRS

Data Management: Data Integration/Data Federation

Data Preparation Techniques for Analytics in SAS® Enterprise Guide®

In this session we will cover the data structures required for different types of analytics, including descriptive statistics, modeling, multivariate analysis, forecasting and quality control. Using SAS Enterprise Guide we will look at examples on how to create these data structures from raw or transactional data.

CL

Data Preparation Techniques for Data Mining in SAS® Enterprise Guide®

In this session we cover creating a data mart to be used for modeling. We start by discussing the data and data format needed for modeling. We then walk through an example in SAS Enterprise Guide by creating a target variable, creating model input variables from single or multiple variables, recoding variables and subsetting the data to the cases of interest. The entire process is captured in a SAS Enterprise Guide process flow.

CL

Deep Dive on SAS® Enterprise Guide® Data Management

Do the data management tasks in SAS Enterprise Guide puzzle you? Learn how to conduct diverse tasks ranging from simple filtering using the query builder to deriving new variables, transposing and restructuring transactional data to become summarized for analytics.

CL

Getting Started With SAS® Data Integration Server/Studio

Learn how to create jobs, access your data sources, populate your data targets and witness a variety of simple to complex jobs that illustrate key capabilities of SAS Data Integration Server and SAS Data Integration Studio.

CL

Introduction to SAS® Data Loader: The Power of Data Transformation in Hadoop

Organizations are loading data into Hadoop platforms at an extraordinary rate. However, in order to extract value from these platforms, the data must be prepared for analytic exploit. As the volume of data grows, it becomes increasingly more important to reduce data movement, as well as to leverage the computing power of these distributed systems. This paper provides a cursory overview of SAS Data Loader, a product specifically aimed at these challenges. We cover the underlying mechanisms of how SAS Data Loader works, as well as how it's used to profile, cleanse, transform and ultimately prepare data for analytics in Hadoop.

SASGF15

Now That You Have Your Data in Hadoop, How Are You Staging Your Analytical Base Tables?

Well, Hadoop community, now that you have your data in Hadoop, how are you staging your analytical base tables? In my discussions with clients about this, we all agree on one thing: Data sizes stored in Hadoop prevent us from moving that data to a different platform in order to generate the analytical base tables. To address this dilemma, I want to introduce to you SAS® In-Database Code Accelerator for Hadoop.

SASGF15

Real Time: Is That Your Final Decision?

Streaming data is becoming more and more prevalent. Everything is generating data now - social media, machine sensors, the Internet of Things. And you need to decide what to do with that data right now. And "right now" could mean 10,000 times or more per second. SAS® Event Stream Processing provides an infrastructure for capturing streaming data and processing it on the fly - including applying analytics and deciding what to do with that data. All in milliseconds. There are some basic tenets on how SAS provides this extremely high-throughput, low-latency technology to meet whatever streaming analytics your company might want to pursue.

SASGF15

SAS/ACCESS® Technology

Current advances in database technologies open up a whole new world of possibilities in working with relational database management systems. Learn more about how SAS can improve performance using SQL pass-through, in-database processing, parallel reads and SAS programming options, and functions and macros specific to DBMS processing. We will compare using PROC SQL to the Libname statement and the SAS DATA step with relational databases.

CL

SAS® and SAP Business Warehouse on SAP HANA: What's in the Handshake?

Is your company using or considering using SAP Business Warehouse (BW) powered by SAP HANA? SAS provides various levels of integration with SAP BW in an SAP HANA environment. This integration enables you to not only access SAP BW components from SAS, but to also push portions of SAS analysis directly into SAP HANA, accelerating predictive modeling and data mining operations. This paper explains the SAS toolset for different integration scenarios, highlights the newest technologies contributing to integration, and walks you through examples of using SAS with SAP BW on SAP HANA. The paper is targeted at SAS and SAP developers and architects interested in building a productive analytical environment with the help of the latest SAS and SAP collaborative advancements.

SASGF15

What's New in SAS® Data Integration Server/Studio?

Explore selected changes and enhancements in SAS 9.3 and/or 9.4, including a discussion of changes to the interface and heavily used transforms.

CL

Using Advanced Data Transformations in SAS® Data Integration Studio to Load Analytical Data Models

Interactive scatter plots and detailed trend analysis are both visually appealing for data scientists trying to better understand their data. The hidden, but not to be overlooked, tasks of data management ensure those graphic visualizations are accurate and reliable. This presentation shows some of the processes that go into building an analytical data model. Data profiling, data cleansing and the transformations required to populate an efficient analytical model will be demonstrated to show the importance of data preparation and the technologies that make it happen.

CES

Data Management: Data Quality

Garbage In, Gourmet Out: How to Leverage the Power of the SAS® Quality Knowledge Base

Companies spend vast amounts of resources developing and enhancing proprietary software to clean their business data. Save time and obtain more accurate results by leveraging the SAS Quality Knowledge Base (QKB), formerly a DataFlux® technology. Tap into the existing QKB rules for cleansing contact information or product data, or easily design your own custom rules using the QKB editing tools. The QKB enables data management operations such as parsing, standardization and fuzzy matching for contact information such as names, organizations, addresses and phone numbers, or for product data attributes such as materials, colors and dimensions. The QKB supports data in native character sets in more than 38 locales. A single QKB can be shared by multiple SAS Data Management installations across your enterprise, ensuring consistent results on workstations, servers and massive parallel processing systems such as Hadoop. In this session, a SAS R&D manager demonstrates the power and flexibility of the QKB, and answers your questions about how to deploy and customize the QKB for your environment.

SASGF15

SAS® Data Management: Technology Options for Ensuring a Quality Journey Through the Data Management Process

When planning for a journey, one of the main goals is to get the best value possible. The same thing could be said for your corporate data as it journeys through the data management process. It is your goal to get the best data in the hands of decision makers in a timely fashion, with the lowest cost of ownership and the minimum number of obstacles. The SAS Data Management suite of products provides you with many options for ensuring value throughout the data management process. The purpose of this session is to focus on how the SAS Data Management solution can be used to ensure the delivery of quality data, in the right format, to the right people, at the right time. The journey is yours, the technology is ours - together, we can make it a fulfilling and rewarding experience.

SASGF15

Data Quality: Building Complex Process Jobs to Manage Data Quality Processing Routines

SAS® Data Management Platform offers a myriad of features to help customers cleanse, normalize, enrich and standardize data to meet the requirements of the project at hand. What happens, though, when you have developed all of these sophisticated workflows and you need a method to tie them all together? This presentation will demonstrate optimal uses of the process layer inside SAS Data Management Platform. Whether it be conditional processing, triggering on events or threading processes for performance, this overview will provide optimal use case examples of how to build out process jobs within the data management platform environment.

CES

Industry-Specific SAS® Solutions

SAS® Energy Forecasting Use Cases and Implementation Best Practices

SAS Energy Forecasting improves the forecast accuracy and efficiency of energy forecasts for planning horizons ranging from very short term (next hour) to long term (30-plus years). The implementation of SAS Energy Forecasting can vary in complexity depending on the business and technical requirements of the customer. We will cover the best practices learned after implementing SAS Energy Forecasting around the globe, from an Australian utility to a US electric cooperative. The experiences and forecasting methodologies from those use cases is a must-know for those who will be deploying SAS Energy Forecasting in the field.

CES

Implementing SAS® Event Stream Processing

This presentation walks the audience through a case study of implementing SAS Event Stream Processing.

CES

Implementing SAS® Cybersecurity

This presentation focuses on how to implement SAS Cybersecurity. It also includes best practices for creating and obtaining different types of reports from SAS Cybersecurity.

CES

Planning and Support

Overview of Support.sas.com: The Software User's – or Admin's – Perspective

This website is THE resource for SAS customers who need information about using SAS® software, want to find the answer to a SAS question, sign up for a training course or event, buy a book or learn more about the latest software release. This session will provide a site overview to help SAS users get the most from the site.

CL

Programming

Programming: Applications Development

Divide and Conquer: Writing Parallel SAS® Code to Speed Up Your SAS® Program

Being able to split SAS processing over multiple SAS processors on a single machine or over multiple machines running SAS, as in the case of SAS Grid Manager, enables you to get more done in less time. This paper looks at the methods of using SAS/CONNECT® to process SAS code in parallel, including the SAS statements, macros and PROCs available to make this processing easier for the SAS programmer. SAS products that automatically generate parallel code are also highlighted.

SASGF15

Introduction to PROC REPORT

Become familiar with the capabilities of PROC REPORT as you are introduced to basic concepts and syntax. You will investigate how to generate listing reports, summary reports and totals as you become familiar with this flexible reporting tool.

CL

Introduction to PROC SQL

Investigate the capability of SQL processing within SAS® as you are introduced to basic concepts. Find out how to create columns, subset data and perform simple joins.

CL

Introduction to PROC TABULATE

Confused by PROC TABULATE? Don't know whether to use a comma, asterisk or parenthesis? Well, don't wonder any longer. This presentation is a step-by-step explanation of how to build your TABULATE tables to display information in just the way you want.

CL

Introduction to the SAS® Macro Facility

Learn about the macro facility in an introduction to its purpose and functionality. You will learn the basics of creating and using both macro variables and macro programs.

CL

Introduction to the SAS® Universal Viewer

The SAS Universal Viewer is a replacement for the SAS System Viewer and is an application for the Windows environment to view SAS data sets and other simple text-based files. You cannot edit SAS data sets with the SAS Universal Viewer, but you can sort and filter data sets. The SAS Universal Viewer enables you to view the contents of SAS data sets without invoking SAS and without installing SAS on your machine.

CL

New Macro Features Added in SAS® 9.3 and SAS® 9.4

This paper describes the new features added to the macro facility in SAS 9.3 and SAS 9.4. New features described include the /READONLY option for macro variables, the %SYSMACEXIST macro function, the %PUT &= feature and new automatic macro variables such as &SYSTIMEZONEOFFSET.

SASGF15

PROC SQL Vs. DATA Step Programming

Everyone wants to know: Should I use the DATA step or PROC SQL to join this data? Take a behind-the-scenes look at how the DATA step and SQL procedure process data by comparing all types of joins (inner, left/right, outer) with multiple types of data (one-to-one, one-to-many, many-to-many).

CL

SAS® Macro Facility: Beyond the Basics

Extend your macro understanding with an introduction to macro topics such as iterative processing, conditional processing and macro quoting. You will also see how to create macro variables at execution time using the CALL SYMPUTX routine.

CL

Surviving the SAS® Macro Jungle by Using Your Own Programming Toolkit

At just about any given time, there is a reality show on TV that shows people trying to survive in a harsh environment by using just their wits. Although your environment might not be quite that harsh, maybe you feel you do not have all the tools you need to survive in the macro programming jungle. This presentation's purpose is to provide you with more programming tools to make life in the jungle a whole lot easier. The 10 items discussed here will expand your macro toolkit and enable you to thrive like never before. For example, the new DOSUBL function is the flint that will ignite your code and enable you to dynamically invoke your macro using DATA step logic. Another tool is the stored compiled macro facility, which can provide protection from the elements by enabling you to keep your code safe from prying eyes. Also included is a discussion of the macro debugging system options, MLOGIC, SYMBOLGEN and MPRINT. These options act as a compass to point you in the right direction. They can help guide you past a log riddled with errors to an error-free log that puts you back on the right path. CALL SYMPUTX, the new and improved version of CALL SYMPUT, can help you save steps. CALL SYMPUTX automatically converts a numeric value to character string and even automatically removes the resulting trailing blanks, saving you steps and getting you out of the jungle faster. These tools, along with macro comments, enhancements to %PUT, the MFILE system option, read-only macro variables, the IN operator and SASHELP.VMACRO, help equip all macro programmers with the tools that they need to survive the macro jungle.

OTH

Teach Them to Fish: How to Use Tasks in SAS® Studio to Enable Co-Workers to Run Your Reports Themselves

How many times has this happened to you? You create a really helpful report and share it with others. It becomes popular, and you find yourself running it over and over. Then they start asking, “But can’t you rerun it and just change ___?” (Fill in the blank with whatever “simple” request you can think of.) Don’t you want to just put the report out as a web page with some basic parameters that users can choose themselves and run when they want? Consider writing your own task in SAS Studio! SAS Studio includes several predefined tasks, which are point-and-click user interfaces that guide the user through an analytical process. For example, tasks enable users to create a bar chart, run a correlation analysis or rank data. When a user selects a task option, SAS code is generated and run on the SAS server. Because of the flexibility of the task framework, you can make a copy of a predefined task and modify it or create your own. Tasks use the same common task model and the Velocity Template Language – no Java programming or ActionScript programming is required. Once you have the interface set up to generate the SAS code you need, then you can publish the task for other SAS Studio users to use or you can use a straight URL. Now that others can generate the output themselves, you actually might have time to go fishing!

SASGF15

The SAS® Scalable Performance Data Engine: Moving Your Data to Hadoop Without Giving Up the SAS® Features You Depend On

If you are one of the many customers who want to move your SAS data to Hadoop, one decision you will encounter is what data storage format to use. There are many choices, and all have their pros and cons. One factor to consider is how you currently store your data. If you currently use the BASE engine or the SAS Scalable Performance Data Engine, then using the SPD engine with Hadoop will enable you to continue accessing your data with as little change to your existing SAS programs as possible. This paper discusses the enhancements, usage and benefits of the SAS Scalable Performance Data Engine with Hadoop.

SASGF15

The Top 10 Ways to Optimize Your SAS® Code

Learn tips and tricks to make your SAS code run more efficiently. There are at least six ways to do most things in SAS, so understanding some coding guidelines can help to guide efficient decisions. Some tips include: limiting the amount of data read, index usage and efficient conditional processing.

CL

The Top 3 Things SAS® Programmers Should Know About SAS® Enterprise Guide®

Are you a seasoned SAS programmer? Are you a bit hesitant about this interface called SAS Enterprise Guide? This discussion focuses on questions that SAS programmers might have about SAS Enterprise Guide, such as: Can I still use my SAS code? Are there tasks that are easier with SAS Enterprise Guide? And more!

CL

What’s New in SAS® 9.4

Explore selected changes and enhancements in SAS® 9.4, including a discussion of changes to common procedures.

CL

A Tour of the SAS® University Edition

SAS University Edition is still quite new to many users. This talk explores the SAS University Edition and SAS Studio interface. The talk demonstrates both the built-in point-and-click tasks available in SAS Studio and the programming environment. The presentation also includes a demonstration of how to work in a virtual environment and how to access data files on your hard drive from within the virtual machine (shared folders).

SASPRS

Programming: Data Presentation

An Insider's Guide to ODS LAYOUT Using SAS® 9.4

Whenever you travel, whether it's to a new destination or to your favorite vacation spot, it's nice to have a guide to assist you with planning and setting expectations. The ODS LAYOUT statement became production in SAS 9.4. For those intrepid programmers who used ODS LAYOUT in an earlier release of SAS, this paper contains tons of information about changes you need to know about. Programmers new to SAS 9.4 (or new to ODS LAYOUT) need to understand the basics. This paper reviews some common issues customers have reported to SAS Technical Support when migrating to the LAYOUT destination in SAS 9.4 and explores the basics for those who are making their first foray into the adventure that is ODS LAYOUT. You'll learn tips and tricks to ensure that your trip through the ODS LAYOUT statement will be a fun and rewarding one.

SASGF15

Ask Vince: Moving SAS® Data and Analytical Results to Microsoft Excel

This presentation is an open-ended discussion about techniques for transferring data and analytical results from SAS to Microsoft Excel. There are some introductory comments, but this presentation does not have any set content. Instead, the topics discussed are dictated by attendee questions. Come prepared to ask and get answers to your questions. To submit your questions or suggestions for discussion in advance, go to support.sas.com/surveys/askvince.html.

SASGF15

Creating Multisheet Microsoft Excel Workbooks With SAS®: The Basics and Beyond, Part 2

This presentation explains how to use Base SAS®9 software to create multisheet Excel workbooks. You learn step-by-step techniques for quickly and easily creating attractive multisheet Excel workbooks that contain your SAS output using the ExcelXP Output Delivery System (ODS) tagset. The techniques can be used regardless of the platform on which SAS software is installed. You can even use them on a mainframe! Creating and delivering your workbooks on demand and in real time using SAS server technology is discussed. This presentation contains new and revised material not previously presented.

SASGF15

Graphs Are Really Easy With SAS® 9.4

Data set attribute maps, axis tables, polygon plot, text plot and more such features are added to ODS Graphics procedures and Graph Template Language (GTL) for SAS 9.4. These additions are a direct result of your feedback and are designed to make graphs easier. With these new features you can add multiple tables of data to your graphs anywhere, correctly aligned with the axis values. You can also control the colors for group values in your data and place rotated and aligned text anywhere in the graph. You can overlay jittered markers on box plots, use images and font glyphs as markers, specify group attributes without making style changes, and create entirely new custom graphs using the polygon plot. And you can do all this without even using the annotation facility, which is now supported both for ODS Graphics procedures and GTL. This presentation guides you through all these exciting new features now available in ODS Graphics procedures and GTL.

SASGF15

Preparing Output From Statistical Procedures for Publication, Part 1: PROC REG to APA Format

Many scientific and academic journals require that statistical tables be created in a specific format, with one of the most common formats being that of the American Psychological Association (APA). The APA publishes a substantial guidebook to writing and formatting papers, including an extensive section on creating tables (Nichol 2010). However, the output generated by SAS statistical procedures does not match this style. This paper discusses techniques to change the SAS procedure output to match the APA guidelines using the SAS Output Delivery System (ODS).

OTH

Staying Relevant in a Competitive World: Using the SAS® Output Delivery System to Enhance, Customize and Render Reports

Technology is always changing. To succeed in this ever-evolving landscape, organizations must embrace the change and look for ways to use it to their advantage. Even standard business tasks such as creating reports are affected by the rapid pace of technology. Reports are key to organizations and their customers. Therefore, it is imperative that organizations employ current technology to provide data in customized and meaningful reports across a variety of media. The SAS Output Delivery System (ODS) gives you that edge by providing tools that enable you to package, present and deliver report data in more meaningful ways, across the most popular desktop and mobile devices. To begin, the paper illustrates how to modify styles in your reports using the ODS CSS style engine, which incorporates the use of cascading style sheets (CSS) and the ODS document object model. You also learn how you can use SAS ODS to customize and generate reports in the body of email messages. Then the paper discusses methods for enhancing reports and rendering them in desktop and mobile browsers by using the HTML and HTML5 ODS destinations. To conclude, the paper demonstrates the use of selected SAS ODS destinations and features in practical, real-world applications.

SASGF15

The REPORT Procedure: A Primer for the Compute Block

It is well-known in the world of SAS® programming that the REPORT procedure is one of the best procedures for creating dynamic reports. However, you might not realize that the compute block is where all of the action takes place! Its flexibility enables you to customize your output. This paper is a primer for using a compute block. With a compute block, you can easily change values in your output with the proper assignment statement and add text with the LINE statement. With the CALL DEFINE statement, you can adjust style attributes such as color and formatting. Through examples, you learn how to apply these techniques for use with any style of output. Understanding how to use the compute-block functionality empowers you to move from creating a simple report to creating one that is more complex and informative, yet still easy to use.

SASGF15

What's New in SAS® Studio?

If you've not had a chance to explore SAS Studio yet, or if you're anxious to see what's new, this paper gives you an introduction to this new browser-based interface for SAS programmers and a peek at what's coming. With SAS Studio, you can access your data files, libraries and existing programs, and you can write new programs while using SAS software behind the scenes. SAS Studio connects to a SAS server in order to process SAS programs. The SAS server can be a hosted server in a cloud environment, a server in your local environment or a copy of SAS on your local machine. It's a comfortable environment for those used to the traditional SAS windowing environment (SAS Display Manager), but new features like a query window, process flow diagrams and tasks have been added to appeal to traditional SAS® Enterprise Guide® users.

SASGF15

You Want ME to Use SAS® Enterprise Guide®?

Starting with SAS®9, one copy of SAS Enterprise Guide is included with each PC SAS license. At some sites, desktop PC SAS licenses are being replaced with a single server-based SAS license and desktop versions of Enterprise Guide. This presentation will introduce you to SAS Enterprise Guide and provide you with some good reasons why you should consider using it.

OTH

Programming: General Programming

SAS® Users Can Command Microsoft Excel to Automatically Create Graphs From SAS® ExcelXP Output

With everything becoming more security-aware, hearing that Microsoft Excel 2007 can ignore DDE is no surprise. The SAS ODS Tagset ExcelXP creates *.xml output, and *.xml output cannot contain graphs. Nowadays, no one wants Excel spreadsheets with any kind of macros in the workbook. Most default security settings will not open “macro-infected” workbooks (without an authorized digital signature – just try to get one of those). So how can SAS programmers without admin rights get graphs into your Excel workbooks? One way is to build them in Excel yourself, one at a time. But did you really start writing SAS code to build graphs one at a time in Excel? This paper shows you how to create data using SAS, then command Microsoft Excel to read the data, create a graph or fully reformat a worksheet, and build an *.xls/*.xlsx file (Note: No embedded macros can be saved in *.xlsx files). And you can do all of this without putting an Excel macro into the Excel workbook, with the programs doing it all while you watch, for multiple sheets in a workbook, over and over again. This paper defines the pieces and parts of SAS and Excel code that you can write, which will allow the creation of a fully integrated system to create and format macro-free Excel 2007 workbooks – without downloading any external data or code from the “forbidden, unsecure Internet” – using SAS®9 (SAS 8 if Internet downloads are available) and Excel 97 and above.

SASPRS

Extend the Power of SAS® to Use Callable VBS and VBA Code Files Stored in External Libraries to Control Excel Formatting Routines

Did you ever wish you could use the power of SAS to take control of Excel and make Excel do what you wanted, when you wanted? Well, one letter is the key to doing just that: the letter X, as in the SAS X command, that opens the door to all operating system commands from SAS. The Windows operating system comes with a facility to write a series of commands called scripts. These scripts have the ability to open and reach into the internals of Excel. Scripts can load, execute and remove VBA macro code and control Excel. This level of control allows you to make Excel do what you want, without leaving any traces of a macro behind. This is power.

SASPRS

Give the Power of SAS® to Excel Users Without Making Them Write SAS® Code

Merging the ability to use SAS and Microsoft Excel can be challenging. However, with the advent of SAS® Enterprise Guide®, SAS Integration Technologies, SAS BI Server software, JMP® software and SAS Add-In for Microsoft Office, this process is less cumbersome. Excel has the advantages of being cheap, available, easy to learn and flexible. On the surface, SAS and Excel seem widely separated without these additional SAS products. But wait: Both SAS and Excel can interface with the operating system. SAS can run Excel using the command, and Excel can run SAS as an “application.” This is not DDE; each system works independently of the other. This paper gives an example of Excel controlling a SAS process and returning data to Excel.

SASPRS

Leave Your Bad Code Behind: 50 Ways to Make Your SAS® Code Execute More Efficiently

This laundry list of tips shows 50 ways to help SAS programmers make their code run faster and more efficiently. Topics include maximizing each DATA step, making simple tasks take less code, using macro variables to simplify maintenance, using built-in features, optimizing code to save disk space, using sorts for more than just sorting, and ways to make the program code just read better.

SASPRS

A Survey of Useful SAS® Functions

SAS functions provide amazing power to your DATA step programming. Some of these functions are essential – some of them save you writing volumes of unnecessary code. This talk covers some of the most useful SAS functions. Some of these functions may be new to you, and they will change the way you program and approach common programming tasks. The majority of the functions described in this talk work with character data. There are functions that search for strings, others that can find and replace strings or join strings together. Still others can measure the spelling distance between two strings (useful for “fuzzy” matching). Some of the newest and most amazing functions are not functions at all, but call routines. Did you know that you can sort values within an observation? Did you know that you can not only identify the largest or smallest value in a list of variables, but also identify the second or third or nth largest or smallest value? A knowledge of the functions described here will make you a much better SAS programmer.

SASPRS

Advanced Features of User-Defined Formats and Informats

Formats can do more than just make your output more readable. This paper discusses several of the more advanced features of formats, such as using formats to create new variables, using informats to filter data errors, reading combinations of character and numeric values in one step (using enhanced numeric informats), using formats for table look-up, embedding formats within other formats, multilabel formats, control data sets, and creating format names on the fly in a DATA step to allow multiway table lookups.

SASPRS

Longitudinal Data Techniques: Looking Across Observations

One of the most difficult tasks for a SAS® programmer is to perform operations across multiple observations. For example, you may have a data set of patient visits, with a variable number of visits per patient and the data for each visit stored in a separate observation. Some of the techniques for working with such data include the RETAIN statement, FIRST. and LAST. logical variables, the LAG function, and the use of multiple SET statements (each with a separate FIRSTOBS= option). Other techniques for summarizing data for each patient (such as the number of visits, the mean and median of some variables) involve procedures such as PROC FREQ, PROC MEANS and PROC UNIVARIATE to output summary data sets. This talk will demonstrate and discuss these techniques.

SASPRS

Solutions

Introduction to SAS® Enterprise Guide®

SAS Enterprise Guide is a flexible, user-friendly interface within SAS that allows point-and-click access to prepackaged tasks and reporting, as well as a full programming interface. This presentation investigates some of the basic functionality of SAS Enterprise Guide as it takes a look at reading data, using tasks and manipulating data using the Query Builder window. The programming interface within SAS Enterprise Guide is also explored.

CL

SAS® Marketing Automation Overview

This presentation, intended for those not already familiar with the solution, is an introduction to the complete functionality of SAS Marketing Automation, including analytics, business intelligence, campaign management and data integration. The presentation explains how the solution enables users to execute a closed-loop marketing process. Screenshots of key user interfaces are included.

CL

Clustering Techniques to Uncover Relative Pricing Opportunities: Relative Pricing Corridors Using SAS® Enterprise Miner™ and SAS® Visual Analytics

The impact of price on brand sales is not always linear or independent of other brand prices. We demonstrate, using sales information and SAS Enterprise Miner, how to uncover relative price bands where prices might be increased without losing market share or decreased slightly to gain share.

SASGF15

Establishing a Health Analytics Framework

Medicaid programs are the second-largest line item in each state's budget. In 2012, they contributed \$421.2 billion, or 15 percent, of total national health care expenditures. With US health care reform at full speed, state Medicaid programs must establish new initiatives that will reduce the cost of health care while providing coordinated, quality care to the nation's most vulnerable populations. This paper discusses how states can implement innovative reform through the use of data analytics. It explains how to establish a statewide health analytics framework that can create novel analyses of health data and improve the health of communities. With solutions such as SAS® Claims Analytics, SAS Episode Analytics and SAS Fraud Framework, state Medicaid programs can transform the way they make business and clinical decisions. Moreover, new payment structures and delivery models can be successfully supported through the use of health care analytics. A statewide health analytics framework can support initiatives such as bundled and episodic payments, utilization studies, accountable care organizations and all-payer claims databases. Furthermore, integrating health data into a single analytics framework can provide the flexibility to support a unique analysis that each state can customize with multiple solutions and multiple sources of data. Establishing a health analytics framework can significantly improve the efficiency and effectiveness of state health programs and bend the health care cost curve.

SASGF15

Next Generation: Using SAS® Decision Manager to Modernize and Improve Your Operational Decisions

This paper takes you through the steps for ways to modernize your analytical business processes using SAS Decision Manager, a centrally managed, easy-to-use interface designed for business users. See how you can manage your data, business rules and models, and then combine those components to test and deploy as flexible decisions options within your business processes. Business rules, which usually exist today in SAS code, Java code, SQL scripts or other types of scripts, can be managed as corporate assets separate from the business process. This will add flexibility and speed for making decisions as policies, customer base, market conditions, or other business requirements change. Your business can adapt quickly and still be compliant with regulatory requirements and support overall process governance and risk. This paper shows how to use SAS Decision Manager to build business rules using a variety of methods including analytical methods and straightforward explicit methods. In addition, we demonstrate how to manage or monitor your operational analytical models by using automation to refresh your models as data changes over time. Then we show how to combine your data, business rules and analytical models together in a decision flow, test it and learn how to deploy in batch or real time to embed decision results directly into your business applications or processes at the point of decision.

SASGF15

Real-Time Risk Aggregation With SAS® High-Performance Risk and SAS® Event Stream Processing Engine

Risk managers and traders know that some knowledge loses its value quickly. Unfortunately, due to the computationally intensive nature of risk, most risk managers use stale data. Knowing your positions and risk intraday can provide immense value. Imagine knowing the portfolio risk impact of a trade before you execute. This paper shows you a path to doing real-time risk analysis leveraging capabilities from SAS Event Stream Processing Engine and SAS High-Performance Risk. Event stream processing (ESP) offers the ability to process large amounts of data with high throughput and low latency, including streaming real-time trade data from front-office systems into a centralized risk engine. SAS High-Performance Risk enables robust, complex portfolio valuations and risk calculations quickly and accurately. We present techniques and demonstrate concepts that enable you to more efficiently use these capabilities together. We also show techniques for analyzing SAS high-performance data with SAS® Visual Analytics.

SASGF15

Regulatory Stress Testing: A Manageable Process With SAS®

As a consequence of the financial crisis, banks are required to stress test their balance sheet and earnings based on prescribed macroeconomic scenarios. In the US, this exercise is known as the Comprehensive Capital Analysis and Review (CCAR) or Dodd-Frank Act Stress Testing (DFAST). In order to assess capital adequacy under these stress scenarios, banks need a unified view of their projected balance sheet, incomes and losses. In addition, the bar for these regulatory stress tests is very high regarding governance and overall infrastructure. Regulators and auditors want to ensure that the granularity and quality of data, model methodology and assumptions reflect the complexity of the banks. This calls for close internal collaboration and information sharing across business lines, risk management and finance. Currently, this process is managed in an ad hoc, manual fashion. Results are aggregated from various lines of business using spreadsheets and Microsoft SharePoint. Although the spreadsheet option provides flexibility, it brings ambiguity into the process and makes the process error prone and inefficient. This paper introduces a new SAS stress-testing solution that can help banks define, orchestrate and streamline the stress-testing process for easier traceability, auditability and reproducibility. The integrated platform provides greater control, efficiency and transparency to the CCAR process. This will enable banks to focus on more value-added analysis such as scenario exploration, sensitivity analysis, capital planning and management, and model dependencies. Lastly, the solution was designed to leverage existing in-house platforms that banks may already have in place.

SASGF15

Sensing Demand Signals and Shaping Future Demand Using Multitiered Causal Analysis

The two primary objectives of multitiered causal analysis (MTCA) are to support and evaluate business strategies based on the effectiveness of marketing actions in both a competitive and holistic environment. By tying the performance of a brand, product or SKU at retail to internal replenishment shipments at a point in time, the outcome of making a change to the marketing mix (demand) can be simulated and evaluated to determine the full impact on supply (shipments). The key benefit of MTCA is that it captures the entire supply chain by focusing on marketing strategies to shape future demand and to link them, using a holistic framework, to shipments (supply). These relationships are what truly define the marketplace and all marketing elements within the supply chain.

SASGF15

The Business of Campaign Response Tracking

Tracking responses is one of the most important aspects of the campaign life cycle for a marketing analyst; yet this is often a daunting task. This paper provides guidance for how to determine what is a response, how it is defined for your business and how you collect data to support it. It provides guidance in the context of SAS® Marketing Automation and beyond.

SASGF15

Unconventional Data-Driven Methodologies Forecast Performance in Unconventional Oil and Gas Reservoirs

How does historical production data relate a story about subsurface oil and gas reservoirs? Business and domain experts must perform accurate analysis of reservoir behavior using only rate and pressure data as a function of time. This paper introduces innovative data-driven methodologies to forecast oil and gas production in unconventional reservoirs that, owing to the nature of the tightness of the rocks, render the empirical functions less effective and accurate. You learn how implementations of the SAS® MODEL procedure provide functional algorithms that generate data-driven type curves on historical production data. Reservoir engineers can now gain more insight to the future performance of the wells across their assets. SAS enables a more robust forecast of the hydrocarbons in both an ad hoc individual well interaction and in an automated batch mode across the entire portfolio of wells. Examples of the MODEL procedure arising in subsurface production data analysis are discussed, including the Duong data model and the stretched exponential data model. In addressing these examples, techniques for pattern recognition and for implementing TREE, CLUSTER and DISTANCE procedures in SAS/STAT® are highlighted to explicate the importance of oil and gas well profiling to characterize the reservoir. The MODEL procedure analyzes models in which the relationships among the variables comprise a system of one or more nonlinear equations. Primary uses of the MODEL procedure are estimation, simulation and forecasting of nonlinear simultaneous equation models, and generating type curves that fit the historical rate production data. You will walk through several advanced analytical methodologies that implement the SEMMA process to enable hypothesis testing, as well as directed and undirected data mining techniques. SAS Visual Analytics Explorer drives the exploratory data analysis to surface trends and relationships, and the data QC workflows ensure a robust input space for the performance forecasting methodologies that are visualized in a web-based thin client for interactive interpretation by reservoir engineers.

SASGF15

SAS® GLOBAL FORUM 2016

Please note: SAS Global Forum 2016 presentations are not available until May 2016.

Administration

Administration: Architecture

Best Practices for Resource Management in Hadoop

SAS® solutions that run in Hadoop provide you with the best tools to transform data in Hadoop. They also provide insights to help you make the right decisions for your business. It is possible to incorporate SAS products and solutions into your shared Hadoop cluster in a cooperative fashion with YARN to manage the resources. Best practices and customer examples are provided to show how to build and manage a shared cluster with SAS applications and products.

Ensuring That Your SAS® Infrastructure Is Able to Meet Your SAS® Users' Demands

Now that you have deployed SAS, what should you do to ensure it continues to meet your SAS users' performance expectations? This paper discusses how to proactively monitor your SAS infrastructure, with tools that should be used on a regular basis to keep tabs on infrastructure performance and housekeeping. Basic SAS administration concepts are discussed, with references for blogs, communities and the new visual learning sites.

How to Maintain Happy SAS® 9 Users

Today's SAS environment has large numbers of concurrent SAS processes that have to process ever-growing data volumes. To help SAS users remain productive, SAS administrators must ensure that SAS applications have sufficient computer resources that are properly configured and monitored often. Understanding how all of the components of SAS work and how they are used by your users is the first step. The guidance offered in this paper helps SAS administrators evaluate hardware, operating system, and infrastructure options for a SAS environment that will keep their SAS applications running at optimal performance and keep their user communities happy.

Introducing SAS® Grid Manager for Hadoop

Organizations view Hadoop as a lower cost means to assemble their data in one location. Increasingly, the Hadoop environment also provides the processing horsepower to analyze the patterns contained in this data to create business value. SAS Grid Manager for Hadoop allows you to co-locate your SAS Analytics workload directly on your Hadoop cluster via an integration with the YARN and Oozie components of the Hadoop ecosystem. YARN allows Hadoop to become the "operating system" for your data - it is a tool that manages and mediates access to the shared pool of data, and manages and mediates the resources that are used to manipulate the pool. Learn the capabilities and benefits of SAS Grid Manager for Hadoop, as well as some configuration tips. In addition, sample SAS Grid jobs are provided to illustrate different ways to access and analyze your Hadoop data with your SAS Grid jobs.

Administration: Deployment

Architecting Your SAS® Grid: Networking for Performance

With the popularity of network-attached storage for shared systems, IT shops are increasingly turning to them for SAS Grid implementations. Given the high I/O demand of SAS large block processing, how do you ensure good performance between network-attached SAS Grid nodes and storage? This paper discusses different types of network-attached implementations, what works, and what does not. It provides advice for bandwidth planning, types of network technology to use and what has been practically successful in the field.

Best Practices for Configuring Your I/O Subsystem for SAS®9 Applications

The power of SAS®9 applications allows information and knowledge creation from very large amounts of data. Analysis that used to consist of tens to hundreds of gigabytes (GBs) of supporting data has rapidly grown into the tens to hundreds of terabytes (TBs). This data expansion has resulted in more and larger SAS data stores. Setting up file systems to support these large volumes of data with adequate performance, as well as ensuring adequate storage space for the SAS temporary files, can be very challenging. Technology advancements in storage and system virtualization, flash storage, and hybrid storage management require continual updating of best practices to configure IO subsystems. This paper presents updated best practices for configuring the IO subsystems for your SAS®9 applications, ensuring adequate capacity, bandwidth and performance for your SAS®9 workloads. We have found that very few storage systems work ideally with SAS with their out-of-the-box settings, so it is important to convey these general guidelines.

Getting There From Here: Lifting Enterprise SAS® to the Amazon Public Cloud

If your organization already deploys one or more software solutions via Amazon Web Services (AWS), you know the value of the public cloud. AWS provides a scalable public cloud with a global footprint, allowing users access to enterprise software solutions anywhere at any time. Although SAS began long before AWS was even imagined, many loyal organizations driven by SAS are moving their local SAS analytics into the public AWS cloud, alongside other software hosted by AWS. SAS Solutions OnDemand has assisted organizations in this transition. In this paper, we describe how we extended our enterprise hosting business to AWS. We describe the open source automation framework from which SAS Solutions OnDemand built our automation stack, which simplified the process of migrating a SAS implementation. We'll provide the technical details of our automation and network footprint, a discussion of the technologies we chose along the way, and a list of lessons learned.

Helpful Hints for SAS® 9.4

A group tasked with testing SAS software from the customer perspective has gathered a number of helpful hints for SAS 9.4 that will smooth the transition to its new features and products. These hints will help with the "huh?" moments that crop up when you are getting oriented and will provide short, straightforward answers. We also share insights about changes in your order contents. SAS Customer Experience Testing shares insiders' practical tips - gleaned from extensive multitier deployments - to ensure that you are ready to begin your transition to SAS 9.4 and to provide guidance after you are on SAS 9.4. The target audience for this paper is primarily system administrators who will be installing, configuring or administering the SAS 9.4 environment. This paper was first published in 2012; it has been revised each year since with new information.

Preparing for a SAS® 9.4 Deployment and Managing That Deployment Throughout Its Life Cycle

SAS 9.4 allows for extensive customization of configuration settings. These settings are changed as new products are added into a deployment and upgrades to existing products are deployed into the SAS infrastructure. The ability to track which configuration settings are changed during the addition of a specific product or the installation of a particular platform maintenance release can be very useful. Oftentimes customers run a SAS deployment step and wonder what exactly changed and in which files. The use of version control systems is becoming increasingly popular for tracking configuration settings. This paper will demonstrate how to use git, a hugely popular open source version control system, to manage, track, audit and revert changes to your SAS configuration infrastructure. Using git, you can quickly list which files were changed by the addition of a product or maintenance package, inspect the differences, and revert back to the previous settings if that becomes desirable.

When the Answer to Public or Private Is Both: Managing a Hybrid Cloud Environment

For many organizations, the answer to whether to manage their data and analytics in a public or private cloud is going to be “both.” “Both” can be the answer for many different reasons: common sense logic not to replace a system that already works just to incorporate something new; legal or corporate regulations that require some data, but not all data, to remain in place; and even a desire to provide local employees with a traditional data center experience while providing remote or international employees with cloud-based analytics easily managed through software deployed via Amazon Web Services (AWS). In this paper, we discuss some of the unique technical challenges of managing a hybrid environment, including how to monitor system performance simultaneously for two different systems that might not share the same infrastructure or even provide comparable system monitoring tools; how to manage authorization when access and permissions might be driven by two different security technologies that make implementation of a single protocol problematic; and how to ensure overall automation of two platforms that might be independently automated, but not originally designed to work together. In this paper, we share lessons learned from a decade of experience implementing hybrid cloud environments.

Administration: SAS® Administration

Advanced Topics in SAS® Environment Manager

Since it was first released three years ago, SAS Environment Manager has been used widely in many customers’ production environments. Customers are now familiar with the basic functions of the product. They are asking for more information about advanced topics, such as how to manage users, roles and permissions; how to secure the product; and how to interact with their existing system management tools in their enterprise environment. This paper addresses those advanced but practical issues from a real customer’s perspective. The paper first briefly lists what’s new in the most current release of SAS Environment Manager. It then discusses the new user management design introduced in the third maintenance release of SAS 9.4. We explain how that design addresses customers’ concerns and the best practices for using that design and for setting up user roles and permissions. We also discuss the new process and best practices for configuring SSL for SAS Environment Manager. More and more customers have expressed an interest in integrating SAS Environment Manager with their own system management tools. Our discussion ends with explaining how customers can do that through the SNMP interface built into SAS Environment Manager.

Getting Data Into Your SAS® Cloud Environment

As more of your work is performed in an off-premises cloud environment, understanding how to get the data you want to analyze and report on becomes important. In addition, working in a cloud environment like Amazon Web Services might be something that is new to you or to your organization when you use a product like SAS Visual Analytics. This presentation discusses how to get the best use out of cloud resources, how to efficiently transport information between systems, and how to continue to leverage data in an on-premises database management system (DBMS) in your future cloud system.

Reeling Them Back In: Keeping SAS® Visual Analytics Users Happy, Behind the Scenes

SAS Visual Analytics offers many new and exciting ways to look at your data. Users are able to load data at will to explore and ask questions of their data. But what happens if you need to prevent users from viewing all data? What can you do to prevent users from loading too much data? What happens if a user loads data that exceeds the hardware capacity of your environment? This session covers practical ways to limit available resources and secure SAS® LASR™ data. Real-world scenarios are covered, and attendees can participate in an open discussion.

SAS® Grid Administration Made Simple

Historically, administration of your SAS Grid Manager environment has required interaction with a number of disparate applications, including Platform RTM for SAS, SAS Management Console, and command line utilities. With the third maintenance release of SAS 9.4, you can now use SAS Environment Manager for all monitoring and management of your SAS Grid. The new SAS Environment Manager interface gives you the ability to configure the Load Sharing Facility (LSF), manage and monitor high-availability applications, monitor overall SAS grid health, define event-based alerts, and much, much more through a single, unified, web-based interface.

Administration: Security

By the Docs: Securing SAS® Software

Have you ever wondered the best way to secure SAS software? Many pieces need to be secured – from passwords and authentication to encryption of data at rest and in transit. During this presentation we discuss several security tasks that are important when setting up SAS, and we provide some tips for finding the information you need in the mountains of SAS documentation. The tasks include 1) enabling basic network security (TLS) using the automation options in the latest release of SAS 9.4; 2) configuring HTTPS for the SAS middle tier (once the TLS connection is established); 3) setting up user accounts and IDs with an eye toward auditing user activity. Whether you are an IT expert who is concerned about corporate security policies, a SAS administrator who needs to be able to describe SAS capabilities and configure SAS software to work with corporate IT standards, or an auditor who needs to review specific questions about security vulnerabilities, this presentation is for you.

How to Make Your SAS® Web Applications More Secure: Top 10 Tips

Most SAS products are offered as web-based applications these days. Even though a web-based interface provides unmatched accessibility, it comes with known security vulnerabilities. This paper examines the most common exploitation scenarios and suggests the ways to make web applications more secure. The top 10 focus areas include protection of user credentials, use of stronger authentication methods, implementation of SSL for all communications between client and server, understanding of attacking mechanism, penetration testing, adoption and integration with third-party security packages, encryption of any sensitive data, security logging and auditing, mobile device access management and prevention of threats from inside.

Kerberos Delegation With SAS® 9.4

Do you want to see and experience how to configure SAS® Enterprise Miner™ single sign-on? Are you looking to explore setting up Integrated Windows Authentication with SAS Visual Analytics? This hands-on workshop demonstrates how you can configure Kerberos delegation with SAS 9.4. You see how to validate the prerequisites, make the configuration changes, and use the applications. By the end of this workshop, you will be empowered to start your own configuration.

Tips and Best Practices for Configuring Integrated Windows Authentication

Since it makes login transparent and does not send passwords over the wire, Integrated Windows Authentication (IWA) is both extremely convenient for end users and highly secure. However, for administrators, it is not easy to set up and rarely successful on the first attempt, so being able to effectively troubleshoot is imperative. In this paper, we take a step-by-step approach to configuring IWA, explain how and where to get useful debugging output, and share our hard-earned knowledge base of known problems and deciphered error messages.

Tips and Techniques for Using Site-Signed HTTPS with SAS® 9.4

Are you going to enable HTTPS for your SAS environment? Looking to improve the security of your SAS deployment? Do you need more details about how to efficiently configure HTTPS? This paper guides you through the configuration of SAS 9.4 with HTTPS for the SAS middle tier. We examine how best to implement site-signed Transport Layer Security (TLS) certificates and explore how far you can take the encryption. This paper presents tips and proven practices that can help you be successful.

Using Metadata Queries to Build Row-Level Audit Reports in SAS® Visual Analytics

Sensitive data requires elevated security requirements and the flexibility to apply logic that subsets data based on user privileges. Following the instructions in SAS Visual Analytics: Administration Guide gives you the ability to apply row-level permission conditions. After you have set the permissions, you have to prove through audits who has access and row-level security. This paper provides you with the ability to easily apply, validate, report and audit all tables that have row-level permissions, along with the groups, users and conditions that will be applied. Take the hours of maintenance and lack of visibility out of row-level secure data and build confidence in the data and analytics that are provided to the enterprise.

Analytics

Analytics: Data Mining/Text Analytics

An Efficient Pattern Recognition Approach With Applications

This paper presents supervised and unsupervised pattern recognition techniques that use Base SAS® and SAS® Enterprise Miner™ software. A simple preprocessing technique creates many small image patches from larger images. These patches encourage the learned patterns to have local scale, which follows well-known statistical properties of natural images. In addition, these patches reduce the number of features that are required to represent an image and can decrease the training time that algorithms need in order to learn from the images. If a training label is available, a classifier is trained to identify patches of interest. In the unsupervised case, a stacked autoencoder network is used to generate a dictionary of representative patches, which can be used to locate areas of interest in new images. This technique can be applied to pattern recognition problems in general, and this paper presents examples from the oil and gas industry and from a solar power forecasting application.

Deriving Customer Lifetime Value Using SAS® Text Analytics and Survival Analysis

Many industries and businesses have long relied on statistical approaches to solve numerous problems that hinder their productivity and profitability. A growing customer base and unique customer requirements demand that businesses examine business problems from an applied statistical perspective. Businesses today rely heavily on statistical models to predict customer behavior and to forecast events by extrapolating from past observations. User-centric businesses identify and derive value from each existing customer. It is a well-known fact that it is more expensive to obtain a new customer than to retain an existing one. In order to focus on and retain profitable customers, businesses derive customer lifetime value (CLV) for customers and cater to profitable customers differently, depending on the value derived. Traditionally, CLV has been based on past user engagements, purchases and interactions. With the advent of social media and customers' ability to reach out to the rest of the world, it has become imperative to tap into customer sentiment when deriving the CLV. Using SAS survival analysis and SAS Text Analytics tools, we propose a technique for capturing the sentiments of the customer toward the business and toward the products and services provided by that business to derive a true measure of customer lifetime value.

Ensemble Modeling: Recent Advances and Applications

Ensemble models are a popular class of methods for combining the posterior probabilities of two or more predictive models in order to create a potentially more accurate model. This paper summarizes the theoretical background of recent ensemble techniques and presents examples of real-world applications. Examples of these novel ensemble techniques include weighted combinations (such as stacking or blending) of predicted probabilities in addition to averaging or voting approaches that combine the posterior probabilities by adding one model at a time. Fit statistics across several data sets are compared to highlight the advantages and disadvantages of each method, and process flow diagrams that can be used as ensemble templates for SAS® Enterprise Miner™ are presented.

Extending the Armed Conflict Location and Event Data Project With SAS® Contextual Analysis

The Armed Conflict Location and Event Data Project (ACLED) is a comprehensive public collection of conflict data for developing states. As such, the data is instrumental in informing humanitarian and development work in crisis and conflict-affected regions. The ACLED project currently manually codes for eight types of events from a summarized event description, which is a time-consuming process. In addition, when determining the root causes of the conflict across developing states, these fixed event types are limiting. How can researchers get to a deeper level of analysis? This paper showcases a repeatable combination of exploratory and classification-based text analytics provided by SAS Contextual Analysis, applied to the publicly available ACLED for African states. We depict the steps necessary to determine (using semiautomated processes) the next-deeper level of themes associated with each of the coded event types; for example, while there is a broad protests and riots event type, how many of those are associated individually with rallies, demonstrations, marches, strikes and gatherings? We also explore how to use predictive models to highlight the areas that require aid next. We prepare the data for use in SAS Visual Analytics and SAS Visual Statistics using SAS DS2 code and enable dynamic explorations of the new event subtypes. This ultimately provides the end-user analyst with additional layers of data that can be used to detect trends and deploy humanitarian aid where limited resources are needed the most.

Getting More From the Singular Value Decomposition (SVD): Enhance Your Models With Document, Sentence and Term Representations

Since its inception, SAS® Text Miner has used the singular value decomposition (SVD) to convert a term-document matrix to a representation that is crucial for building successful supervised and unsupervised models. In this presentation, using SAS code and SAS Text Miner, we compare these models with those that are based on SVD representations of subcomponents of documents. These more granular SVD representations are also used to provide further insights into the collection. Examples featuring visualizations, discovery of term collocations, and near-duplicate subdocument detection are shown.

Mass-Scale, Automated Machine Learning and Model Deployment Using SAS® Factory Miner and SAS® Decision Manager

Business problems have become more stratified, and microsegmentation is driving the need for mass-scale, automated machine-learning solutions. Additionally, deployment environments include diverse ecosystems, requiring hundreds of models to be built and deployed quickly via web services to operational systems. The new SAS automated modeling tool allows you to build and test hundreds of models across all of the segments in your data, testing a wide variety of machine-learning techniques. The tool is completely customizable, allowing you transparent access to all modeling results. This paper shows you how to identify hundreds of champion models using SAS Factory Miner, while generating scoring web services using SAS Decision Manager. Immediate benefits include efficient model deployments, which allow you to spend more time generating insights that might reveal new opportunities, expose hidden risks, and fuel smarter, well-timed decisions.

SAS® Analytics for Multi-Armed Bandit Market Analysis

This presentation describes the new SAS Customer Intelligence 360 solution for multi-armed bandit analysis of controlled experiments. Multi-armed bandit analysis has been in existence since the 1950s and is sometimes referred to as the K- or N-armed bandit problem. In this problem, a gambler at a row of slot machines (sometimes known as “one-armed bandits”) has to decide which machines to play, as well as the frequency and order in which to play each machine with the objective of maximizing returns. In practice, multi-armed bandits have been used to model the problem of managing research projects in a large organization. However, the same technology can be applied within the marketing space, where, for example, variants of campaign creatives or variants of customer journey subpaths are compared to better understand customer behavior by collecting their respective response rates. Distribution weights of the variants are adjusted as time passes, and conversions are observed to reflect what customers are responding to, thus optimizing the performance of the campaign. The SAS Customer Intelligence 360 analytics engine collects data at regularly scheduled time intervals and processes it through a simulation engine to return an updated weighting schema. The process is automated in the digital space and led through the solution’s content serving and execution engine for interactive communication channels. Both marketing gains and costs are studied during the process to illustrate the business value of multi-arm bandit analysis. SAS has coupled results from traditional A/B testing to feed the multi-armed bandit engine, which are presented.

Streaming Decisions: How SAS® Puts Streaming Data to Work

Sensors, devices, social conversation streams, web movement, and all things in the Internet of Things (IoT) are transmitting data at unprecedented volumes and rates. SAS Event Stream Processing ingests thousands and even hundreds of millions of data events per second, assessing both the content and the value. The benefit to organizations comes from doing something with those results, and eliminating the latencies associated with storing data before analysis happens. This talk bridges the gap. It describes how to use streaming data as a portable, lightweight microanalytics service for consumption by other applications and systems.

Text Mining Secretary Clinton's Emails

The recent controversy regarding former Secretary Hillary Clinton's use of a nongovernment, privately maintained email server provides a great opportunity to analyze real-world data using a variety of analytic techniques. This email corpus is interesting because of the challenges in acquiring and preparing the data for analysis, as well as the variety of analyses that can be performed, including techniques for searching, entity extraction and resolution, natural language processing for topic generation, and social network analysis. Given the potential for politically charged discussion, rest assured there will be no discussion of politics – just fact-based analysis.

Analytics: Data Transparency/Quality Improvements

Health-Care Quality Improvement Using the RAREEVENTS Procedure

In many health-care activities, adverse events are rare because their consequences are so severe that carefully designed processes are in place to prevent them. If you can distinguish between random variation in the frequency of adverse events and unusual variation due to problems with the process, you can take action to fix a broken process without disrupting a stable process. Traditional Shewhart charts that are designed to monitor defect counts are not applicable to monitoring rare events. Such charts tend to be overly sensitive, signaling unusual variation each time an event occurs. This problem can be mitigated by increasing the subgroup sample size, but at the cost of delaying data analysis. In contrast, a rare events chart is well-suited to monitoring low-probability events. The points that are plotted on the chart represent the times between successive events, and the upper and lower limits are based on a probability distribution that is assumed for those times. You can update the chart as soon as an event occurs. The RAREEVENTS procedure, which is new in SAS/QC® 14.1, produces rare events charts. These charts have gained acceptance in health-care quality improvement applications because of their ease of use and their suitability for processes that have low defect rates. This paper presents an overview of PROC RAREEVENTS and illustrates how you can use rare events charts to improve health-care quality.

Improve Your Business Through Process Mining

Looking for new ways to improve your business? Try mining your own data! Event log data is a side product of information systems generated for audit and security purposes and is seldom analyzed, especially in combination with business data. Along with the cloud computing era, more event log data has been accumulated and analysts are searching for innovative ways to take advantage of all data resources in order to get valuable insights. Process mining, a new field for discovering business patterns from event log data, has recently proved useful for business applications. Process mining shares some algorithms with data mining, but it is more focused on interpretation of the detected patterns rather than prediction. Analysis of these patterns can lead to improvements in the efficiency of common existing and planned business processes. Through process mining, analysts can uncover hidden relationships between resources and activities and make changes to improve organizational structure. This paper shows you how to use SAS® Analytics and SAS Decision Management to gain insights from real event-log data.

Analytics: Forecasting/Econometrics

Dynamic Forecast Aggregation

Many organizations need to report forecasts of large numbers of time series at various levels of aggregation. Numerous model-based forecasts that are statistically generated at the lowest level of aggregation need to be combined to form an aggregate forecast that is not required to follow a fixed hierarchy. The forecasts need to be dynamically aggregated according to any subset of the time series, such as from a query. This paper proposes a technique for large-scale automatic forecast aggregation and uses SAS® Forecast Server and SAS/ETS® software to demonstrate this technique.

Forecasting Short Time Series Using SAS® Forecast Server

SAS Forecast Server provides an excellent tool toward forecasting of time series across a variety of scenarios and industries. Given sufficient data, SAS Forecast Server can provide insights into seasonality, trend and effects of input variables and events. In some business cases, there might not be sufficient data within individual series to produce these complex models. This paper presents an approach to forecasting these short time series. Using sufficiently long time series as a training data set, forecasted shape and volumes are created through clustering and attribute-based regressions, allowing for new series to have forecasts based on their characteristics. These forecasts are passed into SAS Forecast Server through preprocessing. Production of artificial history and input variables, matched with a custom model addition to the standard model repository, allows for future values of the artificial variable to be realized as the forecast. This process not only relieves the need for manual entry of overrides, but also allows SAS Forecast Server to choose alternative models as additional observations are provided through incremental loads.

Holiday Demand Forecasting in the Utility Industry

Electric load forecasting is a complex problem that is linked with social activity considerations and variations in weather and climate. Furthermore, electric load is one of only a few goods that requires the demand and supply to be balanced at almost real time (that is, there is almost no inventory). As a result, the utility industry could be much more sensitive to forecast error than many other industries. This electric load forecasting problem is even more challenging for holidays, which have limited historical data. Because of the limited holiday data, the forecast error for holidays is higher, on average, than it is for regular days. Identifying and using days in the history that are similar to holidays to help model the demand during holidays is not new for holiday demand forecasting in many industries. However, the electric demand in the utility industry is strongly affected by the interaction of weather conditions and social activities, making the problem even more dynamic. This paper describes an investigation into the various technologies that are used to identify days that are similar to holidays and using those days for holiday demand forecasting in the utility industry.

How Do My Neighbors Affect Me? SAS/ETS® Methods for Spatial Econometric Modeling

Contemporary data-collection processes usually involve recording information about the geographic location of each observation. This geospatial information provides modelers with opportunities to examine how the interaction of observations affects the outcome of interest. For example, it is likely that car sales from one auto dealership might depend on sales from a nearby dealership, either because the two dealerships compete for the same customers or because of some form of unobserved heterogeneity common to both dealerships. Knowledge of the size and magnitude of the positive or negative “spillover” effect is important for creating pricing or promotional policies. This paper describes how geospatial methods are implemented in SAS/ETS and illustrates some ways you can incorporate spatial data into your modeling toolkit.

Spatial Dependence, Nonlinear Panel Models, and More New Features in SAS/ETS® 14.1

SAS/ETS 14.1 delivers a substantial number of new features to researchers who want to examine causality with observational data in addition to forecasting the future. This release adds count data models with spatial effects, new linear and nonlinear models for panel data, the X13 procedure for seasonal adjustment, and many more new features. This paper highlights the many enhancements to SAS/ETS software and demonstrates how these features can help your organization increase revenue and enhance productivity.

Analytics: Predictive Modeling

A Multistage Modeling Strategy for Hierarchical Demand Forecasting

Although rapid development of information technologies in the past decade has provided forecasters with both huge amounts of data and massive computing capabilities, “sufficient” data and strong computing power do not necessarily translate into good forecasts. Different industries and products have unique demand patterns, and there is no one-size-fits-all forecasting model or technique. For example, in the consumer packaged goods (CPG) industry, demand at the store-SKU level is usually sparse and noisy, making it difficult to extract price and promotional effects. For high-frequency data such as hourly grocery basket transactions, applying traditional time series models is inappropriate and inefficient. A good forecasting model must be tailored for the data in order to capture the salient features and satisfy the business needs.

This paper presents a multistage modeling strategy for hierarchical demand forecasting. The proposed strategy, which has no restrictions on the forecasting techniques or models, provides a general framework to build a forecasting system in three stages. The forecasting system determines a forecast reconciliation level, which is typically some higher level in the hierarchy. In the first stage, feature extraction techniques are combined with time series models to generate a forecast at the reconciliation level. In the second stage, feature extraction techniques are applied again to pool salient features across multiple time series and generate a forecast for each individual time series at a low level. The third stage combines the forecasts obtained from the previous two stages and conducts a top-down reconciliation to generate the final forecast.

Best Practices in Machine Learning Applications

Building representative machine learning models that generalize well on future data requires careful consideration, both of the data at hand and of assumptions about the various available training algorithms. Data is rarely in an ideal form that enables algorithms to train effectively. Some algorithms are designed to account for important considerations such as variable selection and handling of missing values, whereas other algorithms require additional preprocessing of the data or appropriate tweaking of the algorithm options. Ultimate evaluation of a model's quality requires appropriate selection and interpretation of an assessment criterion that is meaningful for the given problem. This paper discusses the most common mistakes that machine learning practitioners make and provides guidance for using these powerful algorithms to build effective models.

Leveraging Advanced Analytics in Pricing and Inventory Decisions at Electrolux

Electrolux is one of the largest appliance manufacturers in the world. It sells more than 2,000 products to end consumers through 9,000 business customers. As a result of globalization, the appliance market has become increasingly competitive, with market conditions that challenge profitability for appliance manufacturers. Moreover, high material costs and the capital-intensive nature of the industry make it essential that companies understand demand signals and utilize supply chain capacity as effectively as possible. To grow and increase profitability under these challenging market conditions, Electrolux has partnered with SAS to streamline analysis of pricing and profitability, optimize inventory, and improve service levels to its customers. The price of an appliance is determined by a number of factors, such as the strategic importance of customers, supply chain costs, market conditions, and competitive prices. Offering promotions is an important part of the marketing strategy at Electrolux; it impacts purchasing behaviors of business customers and end consumers. This paper describes how Electrolux developed a system to analyze product profitability and the impact of promotion on purchasing behaviors of both Electrolux business customers and end consumers. It also discusses how Electrolux uses integrated demand planning and inventory optimization to manage its complex multiechelon supply chain. The process uses historical order data to create a statistical forecast of demand, and then optimizes inventory across the supply chain to satisfy the forecast at desired service levels.

Linear State Space Models in Retail and Hospitality: New Methods of Analyzing Retail Inventory and Hotel Bookings

Retailers need critical information about the expected inventory pattern over the life of a product to make pricing, replenishment and staffing decisions. Hotels rely on booking curves to set rates and staffing levels for future dates. This paper explores a linear state space approach to understanding these industry challenges, applying the SAS/ETS® SSM procedure. We also use the SAS/ETS SIMILARITY procedure to provide additional insight. These advanced techniques help us quantify the relationship between the current inventory level and all previous inventory levels (in the retail case). In the hospitality example, we can evaluate how current total bookings relate to historical booking levels. Applying these procedures can produce valuable new insights about the nature of the retail inventory cycle and the hotel booking curve.

Analytics: Sampling/Survey Research

Survey Data Imputation With PROC SURVEYIMPUTE

Big data, small data - but what about when you have no data? Survey data commonly includes missing values due to nonresponse. Adjusting for nonresponse in the analysis stage might lead different analysts to use different, and inconsistent, adjustment methods. To provide the same complete data to all the analysts, you can impute the missing values by replacing them with reasonable nonmissing values. Hot-deck imputation, the most commonly used survey imputation method, replaces the missing values of a nonrespondent unit by the observed values of a respondent unit.

In addition to performing traditional cell-based hot-deck imputation, the SURVEYIMPUTE procedure, new in SAS/STAT® 14.1, also performs more modern fully efficient fractional imputation (FEFI). FEFI is a variation of hot-deck imputation in which all potential donors in a cell contribute their values.

Filling in missing values is only a part of PROC SURVEYIMPUTE. The real trick is to perform analyses of the filled-in data that appropriately account for the imputation. PROC SURVEYIMPUTE also creates a set of replicate weights that are adjusted for FEFI. Thus, if you use the imputed data from PROC SURVEYIMPUTE along with the replicate methods in any of the survey analysis procedures - SURVEYMEANS, SURVEYFREQ, SURVEYREG, SURVEYLOGISTIC, or SURVEYPHREG - you can be confident that inferences account not only for the survey design, but also for the imputation.

This paper discusses different approaches for handling nonresponse in surveys, introduces PROC SURVEYIMPUTE, and demonstrates its use with real-world applications. It also discusses connections with other ways of handling missing values in SAS/STAT.

Analytics: Statistics/Biostatistics

Tips and Strategies for Mixed Modeling With SAS/STAT® Procedures

Inherently, mixed modeling with SAS/STAT procedures (such as GLIMMIX, MIXED and NLMIXED) is computationally intensive. Therefore, considerable memory and CPU time can be required. The default algorithms in these procedures might fail to converge for some data sets and models. This encore presentation of a paper from SAS® Global Forum 2012 provides recommendations for circumventing memory problems and reducing execution times for your mixed-modeling analyses. This paper also shows how the new HPMIXED procedure can be beneficial for certain situations, as with large sparse mixed models. Lastly, the discussion focuses on the best way to interpret and address common notes, warnings, and error messages that can occur with the estimation of mixed models in SAS software.

Everyone CAN Be a Data Scientist: Using SAS® Studio to Create a Custom Task for SAS® In-Memory Statistics

SAS In-Memory Statistics uses a powerful interactive programming interface for analytics, aimed squarely at the data scientist. We show how the custom tasks that you can create in SAS Studio (a web-based programming interface) can make everyone a data scientist! We explain the Common Task Model of SAS Studio, and we build a simple task in steps that carries out the basic functionality of the IMSTAT procedure. This task can then be shared among all users, empowering everyone on their journey to becoming a data scientist. During the presentation, it will become clear that not only can shareable tasks be created, but the developer does not have to understand coding in Java, JavaScript, or ActionScript. We also use the task we created in the Visual Programming perspective in SAS Studio.

Fitting Multilevel Hierarchical Mixed Models Using PROC NL MIXED

Hierarchical nonlinear mixed models are a class of complex models that arises naturally in many fields. The NL MIXED procedure's ability to fit linear or nonlinear models with standard or general distributions enables you to fit a wide range of such models. SAS/STAT® 13.2 enhanced PROC NL MIXED to support multiple RANDOM statements, enabling you to fit nested multilevel mixed models. This paper uses various examples to illustrate the new functionality.

Fitting Your Favorite Mixed Models With PROC MCMC

The popular MIXED, GLIMMIX, and NL MIXED procedures in SAS/STAT® fit linear, generalized linear, and nonlinear mixed models, respectively. These procedures take the classical approach of maximizing the likelihood function to estimate model parameters, using methods such as maximum likelihood and restricted maximum likelihood. The flexible MCMC procedure in SAS/STAT® can fit these same models by taking a Bayesian approach. Instead of maximizing the likelihood function, PROC MCMC draws samples (using a variety of sampling algorithms) to approximate the posterior distributions of model parameters, which is the key to Bayesian analysis. Similar to the mixed modeling procedures, PROC MCMC provides estimation, inference and prediction. This paper describes how to use the MCMC procedure to fit Bayesian mixed models and compares the Bayesian approach to how the classical models would be fit with the familiar mixed modeling procedures. The paper also discusses unique aspects of the Bayesian approach that are not related to the classical approach. Several examples illustrate the approach in practice.

Highly Customized Graphs Using ODS Graphics

You can use annotation, modify templates, and change dynamic variables to customize graphs in SAS®. Standard graph customization methods include template modification (which most people use to modify graphs that analytical procedures produce) and SG annotation (which most people use to modify graphs that procedures such as PROC SG PLOT produce). However, you can also use SG annotation to modify graphs that analytical procedures produce. You begin by using an analytical procedure, ODS Graphics, and the ODS OUTPUT statement to capture the data that goes into the graph. You use the ODS document to capture the values that the procedure sets for the dynamic variables, which control many of the details of how the graph is created. You can modify the values of the dynamic variables, and you can modify graph and style templates. Then you can use PROC SG RENDR along with the ODS output data set, the captured or modified dynamic variables, the modified templates, and SG annotation to create highly customized graphs. This paper shows you how and provides examples.

Statistical Model Building for Large, Complex Data: Five New Directions in SAS/STAT® Software

The increasing size and complexity of data in research and business applications require a more versatile set of tools for building explanatory and predictive statistical models. In response to this need, SAS/STAT software continues to add new methods. This presentation takes you on a high-level tour of five recent enhancements: new effect selection methods for regression models with the GLMSELECT procedure, model selection for generalized linear models with the HPGENSELECT procedure, model selection for quantile regression with the HPQUANTSELECT procedure, construction of generalized additive models with the GAMPL procedure, and building classification and regression trees with the HPSPLIT procedure. For each of these approaches, the presentation reviews its key concepts, uses a basic example to illustrate its benefits, and guides you to information that will help you get started.

Using SAS® Simulation Studio to Test and Validate SAS/OR® Optimization Models

In many discrete-event simulation projects, the chief goal is to investigate the performance of a system. You can use output data to better understand the operation of the real or planned system and to conduct various what-if analyses. But you can also use simulation for validation – specifically, to validate a solution found by an optimization model. In optimization modeling, you almost always need to make some simplifying assumptions about the details of the system you are modeling. A common approach holds each random element at some nominal value (such as the mean of its observed values) and proceeds with the optimization. You can do better. In order to test an optimization model and its underlying assumptions, you can build a simulation model of the system that uses the optimal solution as an input and simulates the system’s detailed behavior. This paper describes cases in which simulation and optimization can be used together in this manner and discusses the positive implications of this complementary analytics approach.

Using the OPTMODEL Procedure in SAS/OR® to Find the k Best Solutions

Because optimization models often do not capture some important real-world complications, a collection of optimal or near-optimal solutions can be useful for decision makers. This paper uses various techniques for finding the k best solutions to the linear assignment problem in order to illustrate several features recently added to the OPTMODEL procedure in SAS/OR software. These features include the network solver, the constraint programming solver (which can produce multiple solutions), and the COFOR statement (which allows parallel execution of independent solver calls).

Writing Packages: A New Way to Distribute and Use SAS/IML® Programs

SAS/IML 14.1 enables you to author, install, and call packages. A package consists of SAS/IML source code, documentation, data sets, and sample programs. Packages provide a simple way to share SAS/IML functions. An expert who writes a statistical analysis in SAS/IML can create a package and upload it to the SAS/IML File Exchange. A non-expert can download the package, install it, and immediately start using it. Packages provide a standard and uniform mechanism for sharing programs, which benefits both experts and non-experts. Packages are very popular with users of other statistical software, such as R. This paper describes how SAS/IML programmers can construct, upload, download, and install packages. They’re not wrapped in brown paper or tied up with strings, but they’ll soon be a few of your favorite things!

Business Intelligence/Business Analytics

Business Intelligence/Business Analytics: Dashboarding

Using SAS® Visual Analytics to Develop a Real-Time Business Metrics Command Center for Your Office

Seeing business metrics in real time enables a company to understand and respond to ever-changing customer demands. In reality, though, obtaining such metrics in real time is not always easy. However, SAS Australia and New Zealand Technical Support solved that problem by using SAS Visual Analytics to develop a 16-display command center in the Sydney office. Using this center to provide real-time data enables the Sydney office to respond to customer demands across the entire South Asia region.

The success of this deployment makes reporting capabilities and data available for Technical Support hubs in Wellington, Mumbai, Kuala Lumpur, and Singapore, covering a total distance of 12,360 kilometers (approximately 7,680 miles). By sharing SAS Visual Analytics report metrics on displays spanning multiple time zones that cover a seven-hour time difference, SAS Australia and New Zealand Technical Support has started a new journey of breaking barriers, collaborating more closely, and providing fuel for innovation and change for an entire region. This paper is aimed at individuals or companies who want to learn how SAS Australia and New Zealand Technical Support developed its command center, and who are inspired to do the same for their offices!

Business Intelligence/Business Analytics: Data Exploration

Location, Location, Location: Analytics With SAS® Visual Analytics and Esri

Business intelligence users analyze business data in a variety of ways. Seventy percent of business data contains location information. For in-depth analysis, it is essential to combine location information with mapping. New analytical capabilities added to SAS Visual Analytics leverage the new partnership with Esri, a leader in location intelligence and mapping. The new capabilities enable users to enhance the analytical insights from SAS Visual Analytics. This paper demonstrates and discusses the new partnership with Esri and the new capabilities added to SAS Visual Analytics.

Pedal-to-the-Metal Analytics With SAS® Studio, SAS® Visual Analytics, and SAS® Visual Statistics

“Pedal-to-the-metal analytics” is the notion that analytics can be quickly and easily achieved using web technologies. SAS web technologies seamlessly integrate with each other through a web browser and with data via web APIs, enabling organizations to leapfrog traditional, manual analytics and data processes. Because of this integration (and the operational efficiencies obtained as a result), pedal-to-the-metal analytics dramatically accelerates the analytics life cycle, which consists of these steps: 1) data preparation; 2) exploration; 3) modeling; 4) scoring; and 5) evaluating results. In this paper, data preparation is accomplished with SAS Studio custom tasks (reusable drag-and-drop visual components or interfaces for underlying SAS code). This paper shows users how to create and implement these for public health surveillance. With data preparation complete, explorations of the data can be performed using SAS Visual Analytics. Explorations provide insights for creating, testing, and comparing models in SAS Visual Statistics to predict or estimate risk. The model score code produced by SAS Visual Statistics can then be deployed from within SAS Visual Analytics for scoring. Furthermore, SAS Visual Analytics provides the necessary dashboard and reporting capabilities to evaluate modeling results. In conclusion, the approach presented in this paper provides both new and longtime SAS users with easy-to-follow guidance and a repeatable workflow to maximize the return on their SAS investments while gaining actionable insights on their data. So fasten your seat belts and get ready for the ride!

Running Text Analytics Models in Hadoop

Hadoop took the world by storm as a cost-efficient software framework for storing data. Hadoop is more than that; it's an analytics platform. Analytics is more than just crunching numbers; it's also about gaining knowledge from your organization's unstructured data. SAS® has the tools to do both. In this paper, we demonstrate how to access your unstructured data, automatically create a text analytics model, deploy that model in Hadoop, and run the SAS In-Database Code Accelerator for Hadoop to give you insights into your big and unstructured data lying dormant in Hadoop. We show you how the insights gained can help you make better informed decisions for your organization.

Business Intelligence/Business Analytics: Data Reporting

Bringing Google Analytics, Facebook, and Twitter Data to SAS® Visual Analytics

Your marketing team would like to pull data from its different marketing activities into one report. What happens in Vegas might stay in Vegas, but what happens in your data does not have to stay there, locked in different tools or static spreadsheets. Learn how to easily bring data from Google Analytics, Facebook, and Twitter into SAS Visual Analytics to create interactive explorations and reports on this data along with your other data for better overall understanding of your marketing activity.

Bringing the US Department of Defense From PC to the Enterprise!

A United States Department of Defense agency with over \$40 billion in sales and revenue, 25,000 employees, and 5.3 million parts to source, partnered with SAS to turn its disparate PC-based analytics environment into a modern SAS® Grid Computing server-based architecture. This presentation discusses the challenges of underpowered desktops, data sprawl, outdated software, difficult upgrades, and inefficient compute processing and the solution crafted to enable the agency to run as the Fortune 50 company that its balance sheet (and our nation's security) demand. In the modern architecture, rolling upgrades, high availability, centralized data set storage, and improved performance enable improved forecasting getting our troops the supplies they need, when and where they need them.

Building Interactive Microsoft Excel Worksheets With SAS® Office Analytics

Microsoft Office has over 1 billion users worldwide, making it one of the most successful pieces of software on the market today. Imagine combining the familiarity and functionality of Microsoft Office with the power of SAS® to include SAS content in a Microsoft Office document. By using SAS Office Analytics, you can create Microsoft Excel worksheets that are not just static reports, but interactive documents. This paper looks at opening, filtering, and editing data in an Excel worksheet. It shows how to create an interactive experience in Excel by leveraging Visual Basic for applications using SAS data and stored processes. Finally this paper shows how to open SAS Visual Analytics reports into Excel, so the interactive benefits of SAS Visual Analytics are combined with the familiar interface of an Excel worksheet. All of these interactions with SAS content are possible without leaving Microsoft Excel.

Carry-On Suitcases and Mobile Devices: Using SAS® Visual Analytics Designer for Creating Optimally Designed Mobile Reports

Packing a carry-on suitcase for air travel and designing a report for mobile devices have a lot in common. Your carry-on suitcase contains indispensable items for your journey, and the contents are limited by tight space. Your reports for mobile devices face similar challenges; data display is governed by tight real-estate space and other factors, such as users' shorter attention spans and information density. How do you overcome these challenges while displaying data effectively for your mobile users?

This paper demonstrates how smaller real estate on mobile devices, as well as device orientation in portrait or landscape mode, influences best practices for designing reports. The use of containers, layouts, filters, information windows, and carefully selected objects enable you to design and guide user interaction effectively. Appropriate selection of font styles, font sizes, and colors reduce distraction and enhance quick user comprehension. By incorporating these recommendations into your report design, you can produce reports that display seamlessly on mobile devices and browsers.

Designing SAS® Visual Analytics Reports: Write Once, View Anywhere

When you create reports in SAS Visual Analytics, you automatically have reports that work on mobile devices. How do you ensure that the reports are easy to use and understand on all of your desktops, tablets, and phones? This paper describes how you can design powerful reports that your users can easily view on all their devices. You also learn how to deliver reports to users effortlessly, ensuring that they always have the latest reports. Examples show you tips and techniques to use that create the best possible reports for all devices. The paper provides sample reports that you can download and interactively view on your own devices. These reports include before and after examples that illustrate why the recommended best practices are important. By using these tips and techniques you learn how to design a report once and have confidence that it can be viewed anywhere.

If You Build It, Will They Understand? Designing Reports for the General Public in SAS® Visual Analytics

Your organization already uses SAS Visual Analytics, and you have designed reports for internal use. Now you want to publish a report on your external website. How do you design a report for the general public, considering the wide range of education and abilities? This paper defines best practices for designing reports that are universally accessible to the broadest audience. You learn tips and techniques for designing reports that the general public can easily understand and use to gain insight. You also learn how to leverage features that help you comply with your legal obligations regarding users with disabilities. The paper includes recommendations and examples that you can apply to your own reports.

Rapid Prototyping: Accelerating Development of Your Organization's Reports Using SAS® Visual Analytics

One of the most important factors driving the success of requirements gathering can be easily overlooked. Your user community needs to have a clear understanding of what is possible, from different ways to represent a hierarchy to how visualizations can drive an analysis to newer, but less common, visualizations that are quickly becoming standard. Discussions about desktop access versus mobile deployment and/or which users might need more advanced statistical reporting can lead to a serious case of option overload. One of the best cures for option overload is to provide your users with access to template reports they can explore themselves. In this paper, we describe how you can take a single rich data set and build a set of template reports that demonstrate the full functionality of SAS Visual Analytics, a suite of the most common, most useful SAS Visual Analytics report structures, from high-level dashboards to statistically deep dynamic visualizations. We show exactly how to build a dozen template reports from a single data source, simultaneously representing options for color schemes, themes, and other choices to consider. Although this template suite approach can apply to any industry, our example data set will be publicly available data from the Home Mortgage Disclosure Act, de-identified data on mortgage loan determinations. Instead of beginning requirements gathering with a blank slate, your users can begin the conversation with, "I would like something like Template 4," greatly reducing the time and effort required to meet their needs.

SAS® Mobile Analytics: Accelerate Analytical Insights on the Go

Mobile devices are an integral part of a business professional's life. These mobile devices are getting increasingly powerful in terms of processor speeds and memory capabilities. Business users can benefit from a more analytical visualization of the data along with their business context. The new SAS Mobile BI solution contains many enhancements that facilitate the use of SAS Analytics in the newest version of SAS Visual Analytics. This paper demonstrates how to use the new analytical visualization that has been added to SAS Mobile BI from SAS Visual Analytics for a richer and more insightful experience for business professionals on the go.

SAS® Visual Statistics 8.1: The New Self-Service Easy Analytics Experience

In today's business intelligence world, self-service - which allows an everyday knowledge worker to explore data and personalize business reports without being tech-savvy - is a prerequisite. The new release of SAS Visual Statistics introduces an HTML5-based, easy-to-use user interface that combines statistical modeling, business reporting, and mobile sharing into a one-stop self-service shop. The backbone analytics server of SAS Visual Statistics is also updated, allowing an end user to analyze data of various sizes in the cloud. The paper illustrates this new self-service modeling experience in SAS Visual Statistics using telecom churn data, including the steps of identifying distinct user subgroups using decision tree, building and tuning regression models, designing business reports for customer churn, and sharing the final modeling outcome on a mobile device.

The Six Tenets of a Better Decision

SAS® helps people make better decisions. But what makes a decision better? How can we make sure we are not making worse decisions? There are six tenets to follow to ensure we are making better decisions. Decisions are better when they are: (1) aligned with your mission; (2) complete; (3) faster; (4) accurate; (5) accessible; and (6) recurring, ongoing, or productionalized. By combining all of these aspects of making a decision, you can have confidence that you are making a better decision. The breadth of SAS software is examined to understand how it can be applied toward these tenets. Scorecards are used to ensure that your business stays aligned with goals. Data management is used to bring together all of the data you have to provide complete information. SAS Visual Analytics offerings are unparalleled in their speed to enable you to make faster decisions. Exhaustive testing verifies accuracy. Modern, easy-to-use user interfaces are adapted for multiple languages and designed for a variety of users to ensure accessibility. And the powerful SAS data flow architecture is built for ongoing support of decisions. Several examples from the SAS Solutions OnDemand group are used as case studies in support of these tenets.

Business Intelligence/Business Analytics: Data Visualization

Creating Custom Map Regions in SAS® Visual Analytics

Discover how to answer the “Where?” question of data visualization by leveraging SAS Visual Analytics. Geographical data elements within SAS Visual Analytics provides users the capability to quickly map data by countries and regions, by states or provinces, and by the centroid of US ZIP codes. This paper demonstrates how easy it is to map by these elements. Of course, once your manager sees your new maps he or she will ask for more granular shapes (such as US counties or US ZIP codes). Respond with “Here it is!” Follow the steps provided to add custom boundaries by parsing the shape files into consumable data objects and loading these custom boundaries into SAS Visual Analytics.

Enhanced Segmentation Using SAS® Visual Analytics and SAS® Visual Statistics

What will your customer do next? Customers behave differently; they are not all average. Segmenting your customers into different groups enables you to provide different communications and interactions for the different segments, resulting in greater customer satisfaction as well as increased profits. Using SAS Visual Analytics and SAS Visual Statistics to visualize your segments with respect to customer attributes enables you to create more useful segments for customer relationship management and to understand the value and relative importance of different customer attributes. You can segment your customers by using the following methods: 1) business rules; 2) supervised clustering - decision trees and so on; 3) unsupervised clustering; 4) creating segments based on quantile membership. Whatever way you choose, SAS Visual Analytics enables you to graphically represent your customer data with respect to demographic, geographic, and customer behavioral dimensions. This paper covers the four segmentation techniques and demonstrates how SAS Visual Analytics and SAS Visual Statistics can be used for easy and comprehensive understanding of your customers.

Infographics Powered by SAS® Visual Analytics and SAS® Office Analytics

A picture is worth a thousand words, but what if there are a billion words? This is where the picture becomes even more important, and this is where infographics step in. Infographics are a representation of information in a graphic format designed to make the data easily understandable, at a glance, without having to have a deep knowledge of the data. Due to the amount of data available today, more infographics are being created to communicate information and insight from all available data, both in the boardroom and on social media. This session shows you how to create information graphics that can be printed, shared, and dynamically explored with objects and data from SAS Visual Analytics. Connect your infographics to the high-performance analytical engine from SAS for repeatability, scale, performance on big data, and ease of use. You will see how to leverage elements of your corporate dashboards and self-service analytics while communicating subjective information and adding the context that business teams require, in a highly visual format. This session looks at how SAS Office Analytics enables a Microsoft Office user to create infographics for all occasions. You will learn the workflow that lets you get the most from your SAS Visual Analytics system without having to code anything. You will leave this session with the perfect blend of creative freedom and data governance that comes from leveraging the power of SAS Visual Analytics and the familiarity of Microsoft Office.

Preview of JMP® 13

JMP 13 features to be shown include a multi-DB query builder, virtual joins, new projects, ERIC-criterion Lasso, MaxDiff, Sparse PCA and Association Analysis, RegEx Text exploration, MDS, and fitting simulation.

Stored Processes and SAS® Visual Analytics: Giving Users the Power to Load

A stored process is a SAS program that can be executed as required by different applications. Stored processes have been making SAS users' lives easier for decades. In SAS Visual Analytics, stored processes can be used to enhance the user experience, create custom functionality and output, and expand the usefulness of reports. This paper discusses a technique for how data can be loaded on demand into memory for SAS Visual Analytics and accessed by reports as needed using stored processes. Loading tables into memory so that they can be used to create explorations or reports is a common task in SAS Visual Analytics. This task is usually done by an administrator, enabling the SAS Visual Analytics user to have a seamless transition from data to report. At times, however, users need for tables to be partially loaded or modified in memory on demand. The step-by-step instructions in this paper make it easy enough for any SAS Visual Analytics report builder to include these stored processes in their work. By using this technique, SAS Visual Analytics users have the freedom to access their data without having to work through an administrator for every little task, helping everyone be more effective and productive.

Taming the Rule

When business rules are deployed and executed, either a rule fired or not. If the rule-fired data is not monitored, unintended business impacts can occur based on changing data profiles and characteristics in the data that is provided as input. Also, comparing what-if scenarios using different rules and visually comparing how they might impact your business can mean the difference between meeting compliance regulation, staying relevant, and providing customer satisfaction - or not. Visual analysis of rules that are firing is a powerful way to validate what is expected and to compare impact. This paper shows how to use SAS® Visual Analytics and other visualizations to perform various types of meaningful and useful rule-fired analyses on rules created in SAS Business Rules Manager. Such analyses give organizations or businesses a straightforward way to validate and monitor rules, and keep them from running wild.

The GEOCODE Procedure and SAS® Visual Analytics

SAS Visual Analytics can display maps with your location information. However, you might need to display locations that do not match the categories found in the SAS Visual Analytics interface, such as street address locations or non-US postal code locations. You might also wish to display custom locations that are specific to your business or industry, such as the locations of power grid substations or railway mile markers. Alternatively, you might want to validate your address data. This presentation shows how PROC GEOCODE can be used to simplify the geocoding by processing your location information before putting your data into SAS Visual Analytics.

The New SAS® Map Data Sets

SAS customers have a growing need for accurate and quality SAS maps. SAS has licensed the map data from a third party to satisfy this need. This presentation explores the new map data by discussing the problems and limitations with the old map data, and the features and examples for using the new data.

Data Management

Data Management: Data Integration/Data Federation

An Insider's Guide to SAS/ACCESS® Interface to Hadoop

In the very near future Hadoop will likely find its way into your SAS® environment. It is rapidly displacing database management systems in the corporate world and rearing its head in the SAS world. If you think now is the time to learn how to use SAS with Hadoop, you are in luck. This workshop is the jump-start you need. This workshop shows you how to access Hadoop using SAS. We devote most of our time to exploring SAS/ACCESS Interface to Hadoop. During the workshop you learn how to configure your SAS environment so that you can access Hadoop, how to use the Hadoop FILENAME statement, how to use the HADOOP procedure, and how to use SAS/ACCESS Interface to Hadoop. A basic understanding of Hadoop is a prerequisite for attending this workshop.

An Insider's Guide to SAS/ACCESS® Interface to Impala

Impala is an open source SQL engine designed to bring real-time, concurrent, ad hoc query capability to Hadoop. SAS/ACCESS® Interface to Impala allows SAS® to take advantage of this exciting technology. This presentation uses examples to show you how to increase your program's performance and troubleshoot problems. We discuss how Impala fits into the Hadoop ecosystem and how it differs from Hive. Learn the differences between the Hadoop and Impala SAS/ACCESS engines.

How to Leverage the Hadoop Distributed File System as a Storage Format for the SAS® Scalable Performance Data Server and SAS® Scalable Performance Data Engine

The SAS Scalable Performance Data Server and SAS Scalable Performance Data Engine are data formats from SAS that support the creation of analytical base tables with tens of thousands of columns. These analytical base tables are used to support daily predictive analytical routines. Traditionally Storage Area Network (SAN) storage has been and continues to be the primary storage platform for the SAS Scalable Performance Data Server and SAS Scalable Performance Data Engine formats. Due to cost constraints associated with SAN storage, companies have added Hadoop to their environments to help minimize storage costs. In this paper we explore how the SAS Scalable Performance Data Server and SAS Scalable Performance Data Engine leverage the Hadoop Distributed File System.

It's Raining Data! Harnessing the Cloud with Amazon Redshift and SAS/ACCESS® Software

Every day, companies all over the world are moving their data into the cloud. While there are many options available, much of this data will wind up in Amazon Redshift. As a SAS® user, you are probably wondering, "What is the best way to access this data using SAS?" This paper discusses the many ways that you can use SAS/ACCESS software to get to Amazon Redshift. We compare and contrast the various approaches and help you decide which is best for you. Topics include building a connection, moving data into Redshift, and applying performance best practices.

Modernizing Data Management With Event Streams

Specialized access requirements to tap into event streams vary depending on the source of the events. Open source approaches from Spark, Kafka, Storm, and others can connect event streams to big data lakes, like Hadoop and other common data management repositories. But a different approach is needed to ensure latency and throughput are not adversely affected when processing streaming data with different open source frameworks; that is, they need to scale. This talk distinguishes the advantages of adapters and connectors and shows how SAS® can leverage both Hadoop and YARN technologies to scale while still meeting the needs of streaming data analysis and large, distributed data repositories.

New for SAS® 9.4: Integrating Third-Party Metadata for Use With Lineage and Impact Analysis

Customers are under increasing pressure to determine how data, reports, and other assets are interconnected, and to determine the implications of making changes to these objects. Of special interest is performing lineage and impact analysis on data from disparate systems, for example, SAS, IBM InfoSphere DataStage, Informatica PowerCenter, SAP BusinessObjects, and Cognos. SAS provides utilities to identify relationships between assets that exist within the SAS system, and beginning with the third maintenance release of SAS 9.4, these utilities support third-party products. This paper provides step-by-step instructions, tips, and techniques for using these utilities to collect metadata from these disparate systems, and to perform lineage and impact analysis.

10 Tips to Unlock the Power of Hadoop With SAS®

This paper discusses a set of practical recommendations for optimizing the performance and scalability of your Hadoop system using SAS. Topics include recommendations gleaned from actual deployments from a variety of implementations and distributions. Techniques cover tips for improving performance and working with complex Hadoop technologies such as Kerberos, techniques for improving efficiency when working with data, methods to better leverage the SAS in Hadoop components, and other recommendations. With this information, you can unlock the power of SAS in your Hadoop system.

Unleashing High-Performance Risk Data With the Hadoop Custom File Reader

SAS® High-Performance Risk distributes financial risk data and big data portfolios with complex analyses across a networked Hadoop Distributed File System (HDFS) grid to support rapid in-memory queries for hundreds of simultaneous users. This data is extremely complex and must be stored in a proprietary format to guarantee data affinity for rapid access. But customers still desire the ability to view and process this data directly. This paper demonstrates how to use the HPRISK custom file reader to directly access risk data in Map Reduce jobs, HPDS2, and SAS® LASR™. We also demonstrate how users can use the reader in HPDS2 to back up and modify risk analyses and feed them back into the system using event stream processing to create new analyses.

What's New in SAS® Data Management

The latest releases of SAS Data Integration Studio, SAS Data Management Studio, SAS Data Integration Server, SAS Data Governance, and SAS/ACCESS® software provide a comprehensive and integrated set of capabilities for collecting, transforming, and managing your data. The latest features in the product suite include capabilities for working with data from a wide variety of environments and types, including Hadoop, cloud, RDBMS, files, unstructured data, streaming, and others, and the ability to perform ETL and ELT transformations in diverse run-time environments, including SAS, database systems, Hadoop, Spark, SAS Analytics, cloud, and data virtualization environments. There are also new capabilities for lineage, impact analysis, clustering, and other data governance features for enhancements to master data and support metadata management. This paper provides an overview of the latest features of the SAS Data Management product suite and includes use cases and examples for leveraging product capabilities.

What's New in SAS® Federation Server 4.2

SAS Federation Server is a scalable, threaded, multiuser data access server providing seamlessly integrated data from various data sources. When your data becomes too large to move or copy and too sensitive to allow direct access, the powerful set of data virtualization capabilities allows you to effectively and efficiently manage and manipulate data from many sources, without moving or copying the data. This agile data integration framework allows business users the ability to connect to more data, reduce risks, respond faster, and make better business decisions. For technical users, the framework provides central data control and security, reduces complexity, optimizes commodity hardware, promotes rapid prototyping, and increases staff productivity. This paper provides an overview of the latest features of the product and includes use cases and examples for leveraging product capabilities.

Data Management: Data Quality

Enterprise Data Governance Across SAS® and Beyond

As data management professionals, you have to comply with new regulations and controls. One such regulation is Basel Committee on Banking Supervision (BCBS) 239. To respond to these new demands, you have to put processes and methods in place to automate metadata collection and analysis, and to provide rigorous documentation around your data flows. You also have to deal with many aspects of data management, including data access, data manipulation (ETL and other), data quality, data usage, and data consumption, often from a variety of toolsets that are not necessarily from a single vendor. This paper shows you how to use SAS technologies to support data governance requirements, including third-party metadata collection and data monitoring. It highlights best practices such as implementing a business glossary and establishing controls for monitoring data. Attend this session to become familiar with the SAS tools used to meet the new requirements and to implement a more managed environment.

Get Out of DATA Step Code and Into Quality Knowledge Bases

SAS® programmers spend hours developing DATA step code to clean up their data. Save time and money and enhance your data quality results by leveraging the power of the SAS Quality Knowledge Base (QKB). Knowledge engineers at SAS have developed advanced context-specific data quality operations and packaged them in callable objects in the QKB. In this session, a senior software development manager at SAS explains the QKB and shows how to invoke QKB operations in a DATA step and in various SAS Data Management offerings.

How to Find Your Perfect Match Using SAS® Data Management

SAS® Data Management is not a dating application; however, as a data analyst you do strive to find the best matches for your data. Similar to a dating application, when trying to find matches for your data you need to specify the criteria that constitute a suitable match. You want to strike a balance between being too stringent with your criteria and under-matching your data and being too loose with your criteria and over-matching your data. This presentation highlights various SAS Data Management matching techniques you can put to use to strike the right balance and help your data find its perfect match, and as a result, improve your data for reporting and analytics purposes.

Sparking Analytical Insight With SAS® Data Loader for Hadoop

Sixty percent of organizations will have Hadoop in production by 2016, per a recent TDWI survey, and it has become increasingly challenging to access, cleanse, and move these huge volumes of data. How can data scientists and business analysts clean up their data, manage it where it lives, and overcome the big data skills gap? It all comes down to accelerating the data preparation process. SAS Data Loader leverages years of expertise in data quality and data integration, a simplified user interface, and the parallel processing power of Hadoop to overcome the skills gap and compress the time taken to prepare data for analytics or visualization. We cover some of the new capabilities of SAS Data Loader for Hadoop, including in-memory Spark processing of data quality and master data management functions, faster profiling and unstructured data field extraction, and chaining multiple transforms together for improved productivity.

Programming

Programming: Applications Development

A Prompted Application to Easily Create Forest Plots and Inner Margin Tables

Two of the powerful features of ODS Graphics procedures are the ability to create forest plots and add inner margin tables to graphics output. The drawback, however, is that the syntax required by the programmer from PROC TEMPLATE is complex and tedious. A prompted application or even a parameterized stored process that connects PROC TEMPLATE code to a point-and-click application definitely makes life easier for coders in many industries who frequently create these types of graphic output.

Create Web-Based SAS® Reports Without Having to Be a Web Developer

You might already know that SAS Studio tasks provide you with prompts to “fill in the blanks” in SAS code and help you navigate SAS syntax. But did you know that SAS Studio tasks are not only designed to allow you to modify them, but for you to build your own with an entire provided common task model (CTM)? You can build basic utilities or complex reports. You can just run SAS code, or you can have elaborate prompts to dynamically generate code. And since SAS Studio runs in a web browser, your tasks are browser-based and can easily be shared with others. In this paper, you learn how to take a typical SAS program and create a SAS Studio task from it. When the task is run, you see web-based prompts for the dynamic portions of the program and HTML output delivered to your browser.

Programming: Data Presentation

A Ringside Seat: The ODS Excel Destination Versus the ODS ExcelXP Tagset

The new and highly anticipated ODS destination for Microsoft Excel is finally here! Available as a production feature in the third maintenance release of SAS® 9.4 (TS1M3), this new destination generates native Excel (XLSX) files that are compatible with Microsoft Office 2010 or later. This paper is written for anyone, from entry-level programmers to business analysts, who use SAS and Microsoft Excel to create reports.

The discussion covers features and benefits of the new Excel destination, differences between the Excel destination and the older ExcelXP tagset, and functionality that exists in the ExcelXP tagset that is not available in the Excel destination. These topics are all illustrated with meaningful examples.

The paper also explains how you can bridge the gap that exists as a result of differences in the functionality between the destination and the tagset. In addition, the discussion outlines when it is beneficial for you to use the Excel destination versus the ExcelXP tagset, and vice versa. After reading this paper, you should be able to make an informed decision about which tool best meets your needs.

Annotating the ODS Graphics Way!

For some users, having an annotation facility is an integral part of creating polished graphics for their work. To meet that need, we created a new annotation facility for the ODS Graphics procedures in SAS® 9.3. Now, with SAS 9.4, the Graph Template Language (GTL) supports annotation as well! In fact, GTL annotation facility has some unique features not available in the ODS Graphics procedures, such as using multiple sets of annotation in the same graph and the ability to bind annotation to a particular cell in the graph. This presentation covers some basic concepts of annotating that are common to both GTL and the ODS Graphics procedures. I apply those concepts to demonstrate some unique abilities of GTL annotation. Come see annotation in action!

Clinical Graphs Using SAS®

Graphs are essential for many clinical and health care domains, including analysis of clinical trials safety data and analysis of the efficacy of the treatment, such as change in tumor size. Creating such graphs is a breeze with procedures from SAS® 9.4 ODS Graphics. This paper shows how to create many industry-standard graphs – such as Lipid Profile, Swimmer Plot, Survival Plot, Forest Plot with Subgroups, Waterfall Plot, and Patient Profile using Study Data Tabulation Model (SDTM) data – with just a few lines of code.

Graph a Million With the SGPLOT Procedure

In today's world of torrential data, plotting large amounts of data has its own challenges. The SGPLOT procedure in ODS Graphics offers a simple yet powerful tool for your graphing needs. In this paper we present some graphs that work better for large data sets. We create heat maps, box plots, and parallel coordinate plots that visualize large data. You can make your graphs resilient to your growing data with ODS Graphics!

New for SAS® 9.4: A Technique for Including Text and Graphics in Your Microsoft Excel Workbooks, Part 1

A new ODS destination for creating Microsoft Excel workbooks is available starting in the third maintenance release of SAS 9.4. This destination creates native Microsoft Excel XLSX files, supports graphic images, and offers other advantages over the older ExcelXP tagset. In this presentation you learn step-by-step techniques for quickly and easily creating attractive multisheet Excel workbooks that contain your SAS output. The techniques can be used regardless of the platform on which SAS software is installed. You can even use them on a mainframe! Creating and delivering your workbooks on demand and in real time using SAS server technology is discussed. Although the title is similar to previous presentations by this author, this presentation contains new and revised material not previously presented.

That's All Right: More Complex Reports

Are you living in Heartbreak Hotel because your boss wants different statistics in the SAME column on your report? Need a currency symbol in one cell of your pre-summarized data, but a percent sign in another cell? Large blocks of text on your report have you all shook up because they wrap badly on your report? Have you hit the wall with PROC PRINT? Well, rock out of your jailhouse with ODS, DATA step, and PROC REPORT. This paper is a sequel to the popular 2008 paper Creating Complex Reports. The paper presents a nuts-and-bolts look at more complex report examples gleaned from SAS® Community forum questions and questions from students. Examples will include use of DATA step manipulation to produce PROC REPORT and PROC SGPLOT output, as well as examples of ODS LAYOUT and the new report writing interface. And PROC TEMPLATE makes a special guest appearance. Even though the king of rock 'n' roll won't be there for the presentation, perhaps we'll hear his ghost say, "Thank you very much; I always wanted to know how to do that" at the end of this presentation.

The Dynamic Duo: ODS Layout and the ODS Destination for PowerPoint

Like a good pitcher and catcher in baseball, ODS layout and the ODS destination for PowerPoint are a winning combination in SAS® 9.4. With this dynamic duo, you can go straight from performing data analysis to creating a quality presentation. The ODS destination for PowerPoint produces native PowerPoint files from your output. When you pair it with ODS layout, you are able to dynamically place your output on each slide. Through code examples this paper shows you how to create a custom title slide, as well as place the desired number of graphs and tables on each slide. Don't be relegated to the sidelines - increase your winning percentage by learning how ODS layout works with the ODS destination for PowerPoint.

Programming: General Programming

A Second Look at the ODS Destination for PowerPoint

This paper demonstrates how to use the ODS destination for PowerPoint to create attractive presentations from your SAS® output. Packed with examples, this paper gives you a behind-the-scenes tour of how ODS creates PowerPoint presentations. You get an in-depth look at how to customize the ODS PowerPoint style templates that control the appearance of your presentation. With this information you can quickly turn your SAS output into an engaging and informative presentation.

This paper is a follow-on to the SAS Global Forum 2013 paper A First Look at the ODS Destination for PowerPoint.

Data Analysis With User-Written DS2 Packages

The DATA step and DS2 both offer the user a built-in general purpose hash object that has become the go-to tool for many data analysis problems. However, there are occasions where the best solution would require a custom object specifically tailored to the problem space. The DS2 Package syntax allows the user to create custom objects that can form linked structures in memory. With DS2 Packages it is possible to create lists or tree structures that are tailored to the problem space. For data that can describe a great many more states than actually exist, dynamic structures can provide an extremely compact way to manipulate and analyze the data. The SAS® In-Database Code Accelerator allows these custom packages to be deployed in parallel on massive data grids.

Dealing With Nanoseconds in SAS® Datetime Values in Transaction Processing

This presentation describes a technique for dealing with the precision problems inherent in datetime values containing nanosecond data. Floating-point values cannot store sufficient precision for this, and this limitation can be a problem for transactional data where nanoseconds are pertinent. Methods discussed include separation of variables and using the special GROUPFORMAT feature of the BY statement with MERGE in the DATA step.

Deep Dive With SAS® Studio Into SAS® Grid Manager 9.4

Do you know how many different ways SAS Studio can run your programs with SAS Grid Manager? SAS Studio is the latest and coolest interface to SAS. As such, we want to use it in most situations, including sites that leverage SAS Grid Manager. Are you new to SAS and want to be guided by a modern GUI? SAS Studio is here to help you. Are you a code fanatic who wants total control of how your program runs to harness the full power of SAS Grid Manager? Sure, SAS Studio is for you, too. This paper covers all the different SAS Studio editions. You can learn how to connect each of them to SAS Grid Manager and discover best practices for harnessing a high-performance SAS Analytics environment, while avoiding potential pitfalls.

Developing SAS® Studio Repositories

This paper covers developing SAS Studio repositories. SAS Studio introduced a new way of developing custom tasks using an XML markup specification and the Velocity templating language. SAS Studio repositories build on this framework and provide a flexible way to package custom tasks and snippets. Once tasks and snippets are packaged into a repository, they can be shared by users inside your organization or outside your organization. This paper covers how to develop a repository inside of SAS Studio using the new package specification. In addition we cover several different ways to deploy a repository using standard web hosting services, source management services such as github, or your own web content system.

Exploring SAS® Embedded Process Technologies on Hadoop

SAS Embedded Process offers a flexible, efficient way to leverage increasing amounts of data by injecting the processing power of SAS directly where the data lives. SAS Embedded Process can tap into the massively parallel processing (MPP) architecture of Hadoop for scalable performance. Using SAS In-Database Technologies for Hadoop, you can run scoring models generated by SAS® Enterprise Miner™ or, with SAS In-Database Code Accelerator for Hadoop, user-written DS2 programs in parallel. With SAS Embedded Process on Hadoop you can also perform data quality operations, and extract and transform data using SAS Data Loader. This paper explores key SAS technologies that run inside the Hadoop parallel processing framework and prepares you to get started with them.

Finding the One: Using SAS® Code and SAS® Data Quality Server to Create a Perfect Matched Record

In this era of data analytics, you are often faced with a challenge of joining data from multiple legacy systems. When the data systems share a consistent merge key, such as ID or SSN, the solution is straightforward. However, what do you do when there is no common merge key? If one data system has a character value ID field, another has an alphanumeric field, and the only common fields are the names or addresses or dates of birth, a standard merge query does not work. This paper demonstrates fuzzy matching methods that can overcome this obstacle and build your master record through Base SAS coding. The paper also describes how to leverage the SAS Data Quality Server in SAS code.

Implementing Hashing Techniques in SAS®

Although hashing methods such as SHA256 and MD5 are already available in SAS, other methods may be needed by SAS users. This presentation shows how hashing and methods can be implemented using SAS DATA steps and macros, with judicious use of the bitwise functions (BAND, BOR, and so on) and by referencing public domain sources.

REST at Ease With SAS®: How to Use SAS to Get Your REST

Representational State Transfer (REST) is being used across the industry for designing networked applications to provide lightweight and powerful alternatives to web services such as SOAP and Web Services Description Language (WSDL). Since REST is based entirely on HTTP, SAS provides everything you need to make REST calls and to process structured and unstructured data alike. This paper takes a look at how some enhancements in the third maintenance release of SAS 9.4 can benefit you in this area. Learn how the HTTP procedure and other SAS language features provide everything you need to simply and securely use REST.

Using SASIOTEST to Measure I/O Throughput

Have you questioned the read and/or write throughput for your Windows system drive? What about the I/O throughput of a nonsystem drive? One solution is use SASIOTEST.EXE to measure the read or write throughput for any drive connected to your system. Since SAS® 9.2, SASIOTEST.EXE has been included with each release of SAS for Windows. This paper explains the options supported by SASIOTEST and the various ways to use SASIOTEST. It also describes how the I/O relates to SAS I/O on Windows.

Programming: System Integration

A Guide to Section 508 Compliance Using SAS® 9.4 Output Delivery System (ODS)

Disability rights groups are using the court system to exact change. As a result, the enforcement of Section 508 and similar laws around the world has become a priority. When you generate SAS output, you need to protect your organization from litigation. This paper describes concrete steps that help you use SAS 9.4 Output Delivery System (ODS) to create SAS output that complies with accessibility standards. It also provides recommendations and code samples that are aligned with the accessibility standards defined by Section 508 and the Web Content Accessibility Guidelines (WCAG 2.0).

SAS® and Hadoop: The 5th Annual State of the Union

The third maintenance release of SAS 9.4 was a huge release with respect to the interoperability between SAS and Hadoop, the industry standard for big data. This talk brings you up-to-date with where we are: more distributions, more data types, more options. Come and learn about the exciting new developments for blending your SAS processing with your shared Hadoop cluster. Grid processing. Check. SAS data sets on HDFS. Check.

Solutions

Alerts Don't Launder Money (and Finance Terrorism) – People Do!

For far too long, anti-money laundering and terrorist financing solutions have forced analysts to wade through oceans of transactions and alerted work items (alerts). Alert-centered analysis is both ineffective and costly. The goal of an anti-money laundering program is to reduce risk for your financial institution, and to do this most effectively, you must start with analysis at the customer level, rather than simply troll through volumes of alerts and transactions. In this session, discover how a customer-centric approach leads to increased analyst efficiency and streamlined investigations. Rather than starting with alerts and transactions, starting with a customer-centric view allows your analysts to rapidly triage suspicious activities, prioritize work, and quickly move into investigating the highest-risk customer activities.

Best Practices for Effective Model Risk Management

Financial institutions rely heavily on quantitative models for risk management, balance-sheet stress testing and various business analyses and decision-support functions. Investment decisions and business strategies are largely driven by estimates from models. Recent financial crises and model failures at high-profile banks have emphasized the need for better modeling practices. Regulators have stepped in to assist banks with enhanced guidance and regulations for effective model risk management. Effective model risk management is more than developing a good model. SAS® Model Risk Management provides a robust framework to capture and track model inventory. In this paper we present best practices in model risk management learned from implementation projects and interactions with industry experts. These best practices help firms that are setting up a model risk management framework or enhancing their existing practices.

Custom Risk Metrics With SAS® High-Performance Risk

There are standard risk metrics financial institutions use to assess the risk of a portfolio. These include well-known measures like value at risk and expected shortfall and related measures like contribution value at risk. While there are industry-standard approaches for calculating these measures, it is often the case that financial institutions have their own methodologies. Further, financial institutions write their own measures, in addition to the common risk measures. SAS High-Performance Risk comes equipped with over 20 risk measures that use standard methodology, but the product also allows customers to define their own risk measures. These user-defined statistics are treated the same way as the built-in measures, but the logic is specified by the customer. This paper leads the user through the creation of custom risk metrics using the HPRisk procedure.

Evolving Fraud Types: Can Your Application Keep Up?

Does the rapidly changing fraud and compliance landscape make it difficult to adapt your applications to meet your current needs? Fraudsters are constantly evolving, and your applications need to be able to keep up. No two businesses are ever the same. They all have different business drivers, customer needs, market demands, and strategic objectives. Using SAS® Visual Investigator, business units can quickly adapt to their ever-changing needs and deliver what end users and customers need to be effective investigators. Using the administrative tools provided, users can quickly and easily adapt the pages and data structures that underpin applications to fit their needs. This presentation walks through the process of updating an insurance fraud detection system using SAS Visual Investigator, including changing the way alerts are routed to users, pulling in additional information, and building out application pages. It includes an example of how an end user can customize a solution due to changing fraud threats.

From Sensors to Solutions: An Example of Analytics in Motion

Oil and gas wells encounter many types of adverse events, including unexpected shut-ins, scaling, rod pump failures, breakthrough, and fluid influx, to name just a few common ones. This paper presents a real-time event detection system that presents visual reports and alerts petroleum engineers when an event is detected in a well. This system uses advanced time series analysis on both high- and low-frequency surface and downhole measurements. This system gives the petroleum engineer the ability to switch from passive surveillance of events, which then require remediation, to an active surveillance solution, which enables the engineer to optimize well intervention strategies. Events can occur simultaneously or rapidly, or can be masked over long periods of time. We tested the proposed method on data received from both simulated and publicly available data to demonstrate how a multitude of well events can be detected by using multiple models deployed into the data stream. In our demonstration, we show how our real-time system can detect a mud motor pressure failure resulting from a latent fluid overpressure event. Giving the driller advanced warning of the motor state and the potential to fail can save operators millions of dollars a year by reducing nonproductive time caused by these failures. Reducing nonproductive time is critical to reducing the operating costs of constructing a well and to improving cash flow by shortening the time to first oil.

Gathering Customer Information From a Mobile Application

SAS® Customer Intelligence 360 is the new cloud-based customer data gathering application that uses the Amazon Web Services cloud as a hosting platform. Learn how you can instrument your mobile application to gather usage data from your users, as well as provide targeted application content based on either customer behavior or marketing campaigns.

Keeping Hope Afloat: How to Prevent Financial Loss Amongst a Sea of Online Pirates

Gone are the days when the only method of receiving a loan was by visiting your local branch and working with a loan officer. In today's economy, the most powerful weapon in a fraudster's arsenal is an Internet connection. As Internet banking has expanded, so has the threat of automated and organized piracy (fraud). The solution includes components from SAS® Visual Scenario Designer and SAS Event Stream Processing. The process is straightforward: SAS Event Stream Processing processes the streaming transactions and customer operations in real time, correlating customer behavior with the customer profiles that have been built and fine-tuned with SAS Visual Scenario Designer. When a suspicious transaction is detected, the transaction is flagged, and is eventually put on hold. SAS Event Stream Processing triggers an alert to SAS Visual Investigator for manual investigation, or sends an email or SMS text message to investigators and interested parties.

Minimizing Fraud Risk Through Dynamic Entity Resolution and Network Analysis

Every day, businesses have to remain vigilant of fraudulent activity, which threatens customers, partners, employees, and financials. Normally, networks of people or groups perpetrate deviant activity. Finding these connections is now made easier for analysts with SAS® Visual Investigator, an upcoming SAS solution that ultimately minimizes the loss of money and preserves mutual trust among its shareholders. SAS Visual Investigator takes advantage of the capabilities of the new SAS In-Memory Analytics server. Investigators can efficiently investigate suspicious cases across business lines, which has traditionally been difficult. However, the time required to collect, process and identify emerging fraud and compliance issues has been costly. Making proactive analysis accessible to analysts is now more important than ever. SAS Visual Investigator was designed with this goal in mind, and a key component is the visual social network view. This paper discusses how the network analysis view of SAS Visual Investigator, with all its dynamic visual capabilities, can make the investigative process more informative and efficient.

Money Launderers Clean Up Your Act - Catching You Is Now Just a Point-and-Click Away

Wouldn't it be fantastic to develop and tune scenarios in SAS® Visual Scenario Designer and then smoothly incorporate them into your SAS Anti-Money Laundering solution with just a few clicks of your mouse? Well, now there is a way. SAS Visual Scenario Designer is the first data-driven solution for interactive rule and scenario authoring, testing, and validation. It facilitates exploration, visualization, detection, rule writing, auditing, and parameter tuning to reduce false positives; and all of these tasks are performed using point and click. No SAS coding skills required! Using the approach detailed in this white paper, we demonstrate how you can seamlessly port these SAS Visual Scenario Designer scenarios into your SAS Anti-Money Laundering solution. Rewriting the SAS Visual Scenario Designer scenarios in Base SAS is no longer required! Furthermore, the SAS Visual Scenario Designer scenarios are executed on the lightning-fast SAS® LASR™ Analytic Server, reducing the time of the SAS Anti-Money Laundering scenario nightly batch run. The results of both the traditional SAS Anti-Money Laundering alerts and SAS Visual Scenario Designer alerts are combined and available for display on the SAS Enterprise Case Management interface. This white paper describes how the SAS Security Intelligence Practice technical team, along with Yue Chai from SAS Global Professional Services and Delivery, developed this solution. It describes the installation process; gives special considerations for creating SAS Visual Scenario Designer windows, scenarios, and deployments; and explains how to use the SAS Anti-Money Laundering user interface to register SAS Visual Scenario Designer rules into the alert generation process.

Navigating Health Care's Internet of Things

With the advent of digital health, individuals today are monitoring and logging everything from calories burned to medications and supplements taken. With over 100,000 mobile health and wellness apps, and the rise in consumer adoption of wearable technology - smart watches, digital health trackers, and sensor-laden clothing such as smart running shoes - digital health data is today's greatest asset for the health-care industry. The connectivity of all of these devices and things is the Internet of Things phenomenon, or IoT for short. This growing network of everyday objects is game-changing for health care, advancing fields like remote patient monitoring and self-care exponentially. The opportunities for IoT are truly incredible, but it's important to note that the value is not in connecting things, but rather in using all of the connected data to predict and prescribe. This paper explores the opportunities for the Internet of Things and the Analytics of Things in health care, and how to create a health-care Analytics of Things strategy with tools like Hadoop, SAS® Event Stream Processing, predictive analytics, and SAS Visual Analytics.

SAS® Customer Intelligence 360: Creating a Consistent Customer Experience in an Omnichannel Environment

SAS Customer Intelligence 360 enables marketers to create activity maps to delight customers with a consistent experience on digital channels such as web, mobile, and email. Activity maps enable the user to create a customer journey across digital channels and assign conversion measures as individual customers and prospects navigate the customer experience. This session details how those interactions are constructed in terms of what types of interaction tasks are supported and how those interaction tasks can be related to each other in a visual paradigm with built-in goal splits, analytics, wait periods, and A/B testing. Business examples are provided for common omnichannel problems such as cross-selling and customer segmentation. In addition, we cover the integration of SAS Marketing Automation and other marketing products, which enable sites to leverage their current segments and treatments for the digital channels.

Size Optimization Made Simple: Creating Omnichannel and Supply Chain Efficiencies to Increase Consumer Satisfaction and Revenue

Retailers and wholesalers invest heavily in technology, people, processes, and data to create relevant assortments across channels. While technology and vast amounts of data help localize assortments based on consumer preferences, product attributes, and store performance, it's impossible to complete the assortment planning process down to the most granular level of size. The ability to manage millions of size and store combinations is burdensome, not scalable, and not precise. Valuable time and effort is spent creating detailed, insightful assortments only to marginalize those assortments by applying corporate averages of size selling for the purchasing and distribution of sizes to locations. The result is missed opportunity: disappointed customers, lost revenue, and lost profitability due to missing sizes and markdowns on abundant sizes. This paper shows how retailers and wholesalers can transform historical sales data into true size demand and determine the optimal size demand profile to use in the purchasing and allocation of products. You do not need to be a data scientist, statistician, or hold a PhD to augment the business process with approachable analytics and optimization to yield game-changing results!

The Optimization of the Optimal Customer

For marketers who are responsible for identifying the best customer to target in a campaign, it is often daunting to determine which media channel, offer, or campaign program is the one the customer is more apt to respond to, and therefore, is more likely to increase revenue. This presentation examines the components of designing campaigns to identify promotable segments of customers and to target the optimal customers using SAS® Marketing Automation integrated with SAS Marketing Optimization.



To contact your local SAS office, please visit: sas.com/offices