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Program: SAS Overview Seminar
Location: IIT Khagapur
Date: 16th January 2010

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Outline




- What is Data Analytics?
- What is SAS?
- Role of SAS in Various Industries
- Who can benefit from SAS?
- Job Market for SAS Professional
- What does SAS do?
- How does SAS work?
- SAS data Step and Proc Step
- Some SAS procedures
- Various SAS functions

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What is Data Analytics?



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Data Analytics & Research KPO

- Data Analytics and Research processes constitute the **complex end of the Knowledge Process Outsourcing (KPO)** space
- Data Analytics and Research professionals **design financial policies, assess financial consequences of unforeseen events, conduct financial research, and the strategies need to cover the risks**
- In addition to the Core Skills (such as economics, mathematics and statistics), strong **Computer and Communication Skills** are required by the hiring companies

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Data Analytics Best Career Option in 2009



- “Data Analytics is a **great career for people who would enjoy using statistics to unearth patterns in data, using ever more powerful software.** Opportunities are particularly good if you also have **business sense** and the ability to tease out the information that bosses really want to know.”

Source: US News & World Report's Guide to Best Career Option in 2009

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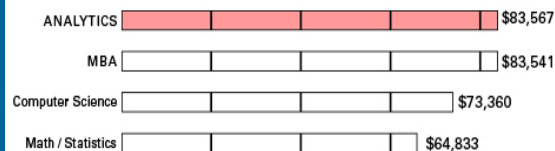
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Data Analytics Better Than Most Career Options



Mean Starting Salary Comparison with other Master Degrees



Sources: Data for 2008 from Graduate Management Admissions Council and National Association of Colleges and Employers


- The Salary for Analytics Freshers in 2008 with:
 - Masters Degree in Stats/Eco/Maths/Engg.
 - Hands-on Knowledge of Analytics Software such as SAS
 - Great Communication Skills
 - Strong Business Sense

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Data Analytics - Required Skills Set




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- Strong **Mathematical Skills**
- Hands-on knowledge of **Statistical Analysis Tool**
- Advance **MS-Excel Modeling & Reporting Skills**
- Excellent **Interpersonal Skills**
- Strong **Oral and Written Communication Skills**
- Strong **Analytical and Problem Solving Skills**
- Ability to work in a **Team and Lead**

Strong Life Skills are Mandatory!!

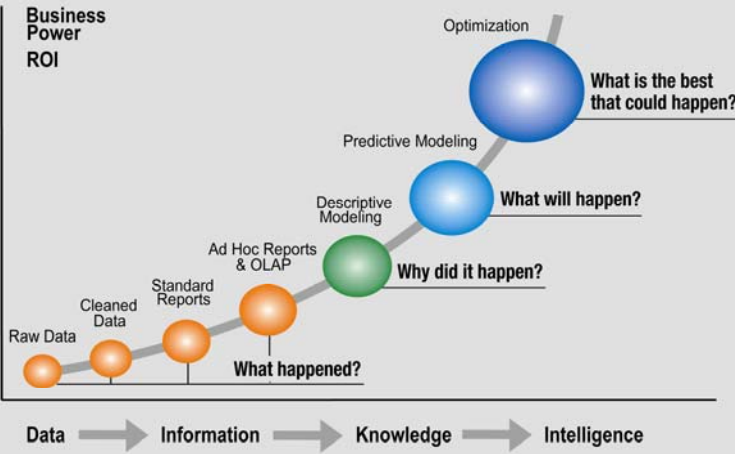
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Data to Information Intelligence Lifecycle



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From Data to Intelligence



Data → Information → Knowledge → Intelligence


ool.com

Source: www.sas.com




What is SAS?

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What is SAS?

- SAS stands for “Statistical Analytical System”
- Developed in early 70’s at the North Carolina State Un.
- SAS Institute Inc., formed in 1976, owns SAS
- World leader in Business Intelligence & Analytics
- 90% of fortune 500 use SAS












“The industry leader in information delivery – the complete process of converting raw data... into meaningful information that is required to support decision making.” – SAS Publishing 1999

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SAS, a leader in BI Tools Industry




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Statistical Analysis	   Win Cross
Predictive Modeling	   EViews 6
Decision Trees & Segmentation	  Knowledge Seeker CART
Forecasting & Simulation	  Crystal Ball
Optimization	 LINDO Evolver Risk Optimizer
Campaign Management	Unica

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SAS is an End to end Data Mgmt and Analytical Tool



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Applications of SAS	<ul style="list-style-type: none"> Data Entry, Retrieval and Management Report Writing Statistical and Mathematical Analysis Business planning, Forecasting and Decision Support Operations Research Quality Improvement Applications Development
SAS Products	<ul style="list-style-type: none"> Base SAS – Data Management and Basic Procedures SAS/SQL – Structured Query Language SAS/STAT – Statistical Analysis SAS/GRAPH – Presentation Quality Graphics SAS/OR – Operations Research SAS/ETS – Econometrics and Time Series Analysis SAS/IML – Interactive Matrix Language

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Role of SAS In Various Industries

















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Role of SAS in Various Industries

Financial Services

- Areas used in
 - Banking
 - Capital Market
 - Credit Unions
 - Lenders
- SAS used for
 - Reporting
 - Data Mining
 - Forecasting
 - Financial Research
 - Predictive Modeling

Retail

- Areas used in
 - Customer Intelligence
 - Operational Intelligence
 - Performance Management Solutions
- SAS used for
 - Reporting
 - Forecasting
 - Market Analysis
 - Data Mining

Life Science & Pharmaceuticals

- Areas used in
 - Clinical Data Integration
 - Drug Development
 - Patient Safety
 - Sales & Marketing
- SAS used for
 - Statistical Analysis
 - Clinical Research
 - Reporting
 - Forecasting
 - Data Mining

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Who can benefit from SAS?



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SAS Provides Career Opportunities for Everyone!

Statistics/Maths graduates	<ul style="list-style-type: none">• Have background in quantitative field• Use SAS for performing simple to complex statistical analysis on relevant data• Can work in any industry
Business/Finance graduates	<ul style="list-style-type: none">• Have management or finance background• Use SAS for decision making purposes• More opportunities in Finance industry
Engineers/Comp. Sc. Graduates	<ul style="list-style-type: none">• Have programming background• Can work as Data Manager/Developer/Programmer
Doctors/Pharma./ Life Sc. Graduates	<ul style="list-style-type: none">• Can work as subject matter expert in research positions

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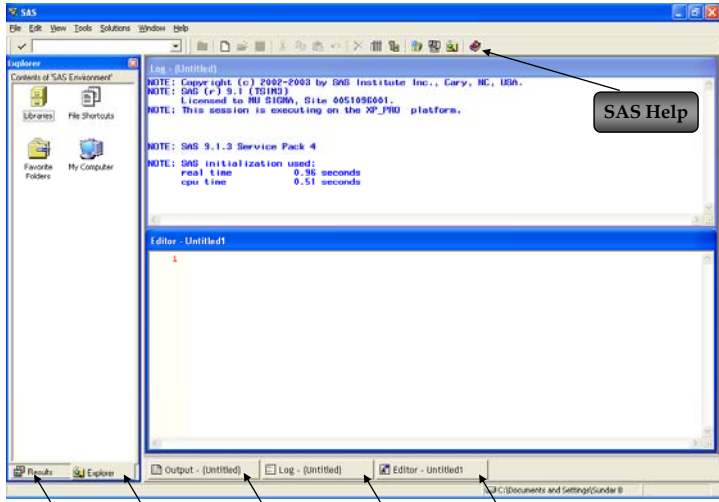
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How does SAS work?

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There are five basic windows available in the SAS software – irrespective of whether its Windows SAS or Unix SAS

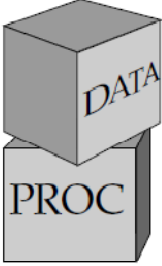




- Editor – Write the SAS program
- Log – Check the log after running the SAS code
- Output – Check the output, if applicable, post SAS processing
- Explorer – Navigate and check libraries and datasets
- Results – Stores past results for review

Results Explorer Output LOG Editor

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Two Basic Parts of a SAS Program




SAS programs are constructed from two basic building blocks:
DATA steps and PROC steps.

A typical program starts with a DATA step to create a SAS data set and then passes the data to a PROC step for processing.

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SAS Data Step



1. Begins with data statements.
2. Perform specific analysis and functions
3. Create new data
4. Modify existing data
5. Merge files

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SAS Proc Step




1. Begins with proc statements.

2. Performs specific analysis or functions

3. Produces outputs, reports and charts.

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Some Basic procedures



- ❑ **Proc Contents** - Displays the structure of the dataset
- ❑ **Proc Print** – Prints entire data or part of the data in the SAS output window
- ❑ **Proc Sort** – Orders the SAS dataset observations by the values of one or more variables
- ❑ **Proc Freq** – Produces one-way to n-way frequency and cross-tabulation (contingency) tables
- ❑ **Proc Means** – Produces summary statistics
- ❑ **Proc Univariate** - Produces summary statistics, basic charts and many other functions
- ❑ **Proc Corr** – Calculates correlation among variables

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Some Advanced procedures



- ❑ **Proc Reg** – Performs multiple linear regression model
- ❑ **Proc Factor** – Performs factor analysis
- ❑ **Proc Fastclus** – Computes K – means cluster
- ❑ **Proc ARIMA** – ARIMA modeling
- ❑ **Proc Logistic** – Binary Logistic modeling
- ❑ **Proc Catmod** – Multinomial Logistic modeling
- ❑ **Proc SQL** – Performs all functions and related with SQL

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Some Character Formats



- ❑ **\$CHARw.** - Writes standard character data
- ❑ **\$QUOTEw.** - Writes data values that are enclosed in double quotation marks
- ❑ **\$REVERJw.** - Writes character data in reverse order and preserves blanks
- ❑ **\$UPCASEw.** - Converts character data to uppercase
- ❑ **\$w.** - Writes standard character data

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Some Date Formats



- ❑ **DDMMYYw.** - Writes date values in the form ddmmyy or ddmmyyyy
- ❑ **MONNAMEw.** - Writes date values as the name of the month
- ❑ **MONTHw.** - Writes date values as the month of the year
- ❑ **WEEKDATEw.** - Writes date values as the day of the week and the date in the form day-of-week, month-name dd, yy (or yyyy)
- ❑ **WEEKDAYw.** - Writes date values as the day of the week
- ❑ **WORDDATEw.** - Writes date values as the name of the month, the day, and the year in the form month-name dd, yyyy

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Some Numeric Formats



- ❑ **BESTw.** - SAS chooses the best notation
- ❑ **COMMAw.d** - Writes numeric values with commas and decimal points
- ❑ **DOLLARw.d** - Writes numeric values with dollar signs, commas, and decimal points
- ❑ **WORDSw.** - Writes numeric values as words

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SAS Functions - Arithmetic



- ❑ **Sum** – gives the sum of a number of variables
- ❑ **Mean** – gives the mean of a number of variables
- ❑ **Log** – finds the natural log of a variable
- ❑ **Log10** - finds the natural log base 10 of a variable
- ❑ **Exp** – finds exponential of a variable
- ❑ **Round** – Rounds a variable to desired place of decimal
- ❑ **Abs** – finds the absolute value of a variable
- ❑ **Int** – gives the integral part of a variable.
- ❑ **Max** – gives the maximum value among a series of variables.
- ❑ **Min** – gives the minimum value among a series of variables.

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SAS Functions - Character



- ❑ **Length** – gives length of a string
- ❑ **Concatenate (||)** – joins more than one string
- ❑ **Substr** - - extracts part of a string
- ❑ **Compress** – removes unwanted blanks from a string
- ❑ **Translate** – converts part of a string to another string
- ❑ **Uppcase** – converts a string to upper case
- ❑

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SAS Functions - Date



- Today() – gives today's date.
- Datetime () – gives today's date and time
- Datepart (Datevar) – gives date-part from a date time variable
- Timepart (Datevar) – gives time-part from a date time variable
- Day (Datevar) – gives day of a date variable
- Month (Datevar) – gives month of a date variable
- Year (Datevar) – gives year of a date variable
- Qtr (Datevar) – gives quarter of a date variable
- Week (Datevar) – gives week number of a date variable
- Weekday (Datevar) – gives day of the week of a date variable
- MDY(month, day, year) – gives a date from month, day & year
- Hour (Timevar) – gives hour from a time variable
- Minutes (Timevar) – gives minutes from a time variable
- Second (Timevar) – gives seconds from a time variable
- Hms (Hr,min,sec) – gives time from hour, minute, second
- Intnx - gives the date after/before certain interval
- Intck - gives diff between 2 dates
-

SAS – Other aspects



- SAS Macro** – is used to have automated programs
- Array** – is used to simultaneously store values of multiple variables
- If-then-else conditions** – used for conditional analysis
- Do-end loops** - used for iterated calculations within loops

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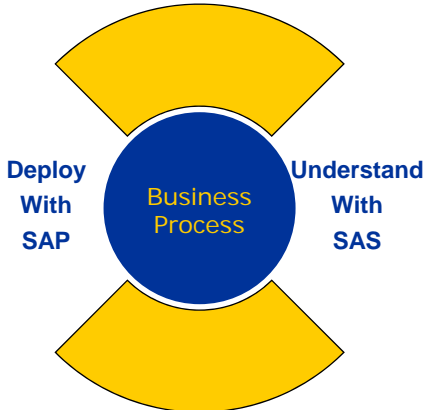


**SAS & SAP (ERP) –
They are not the same!**

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SAS also works with SAP (ERP)

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Deploy With SAP Understand With SAS

Business Process

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SAS + ERP → Enhanced Business Intelligence

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Ivy's Data Analytics Certification Program

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Ivy's Data Analytics Certification KPO Program



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Program	Course Outline	No. of Hours	No. of Assessments
Data Analytics Certification (KPO) <small>(with projects)</small>	Module I – Analytics Essentials <ul style="list-style-type: none"> Statistics Concepts Refresher Course Adv. MS-Excel + VBA Programming Database Handling using SQL Structured Thinking & Problem Solving High Impact Presentation Skills Module II – SAS 9 Analytics <ul style="list-style-type: none"> Statistical Analysis Tool (SAS) Programming Statistical Modeling on SAS 9 Real-time Projects 	102 hrs	7 Written + 15 Case Studies + 2 Projects


- Program Highlights**
 - Personality Excellence & Domain Knowledge
 - 100% Industry Case Based Curriculum & Instruction
 - Experienced Industry Professionals as faculty
 - Industry Simulated Projects (great resume addition!)

Customized batch schedule is also possible!

100% Real-life Case Based Instruction by Industry Professionals

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Ivy's Data Analytics – Know our students



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	Corporate Houses	Colleges
Students from	<ul style="list-style-type: none"> HSBC Frost & Sullivan Neilson Genpact ICICI HDFC Axis Bank Magna Finance Corp TCS Wipro And many more.. 	<ul style="list-style-type: none"> ISI, Kolkata BITS Pilani NIT, Trichy Presidency College Ramakrishna, Narendrapur Calcutta University, Eco / Stats Jadavpur University Lady Brabourne St. Xaviers' College SRCC, Delhi And many more...

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