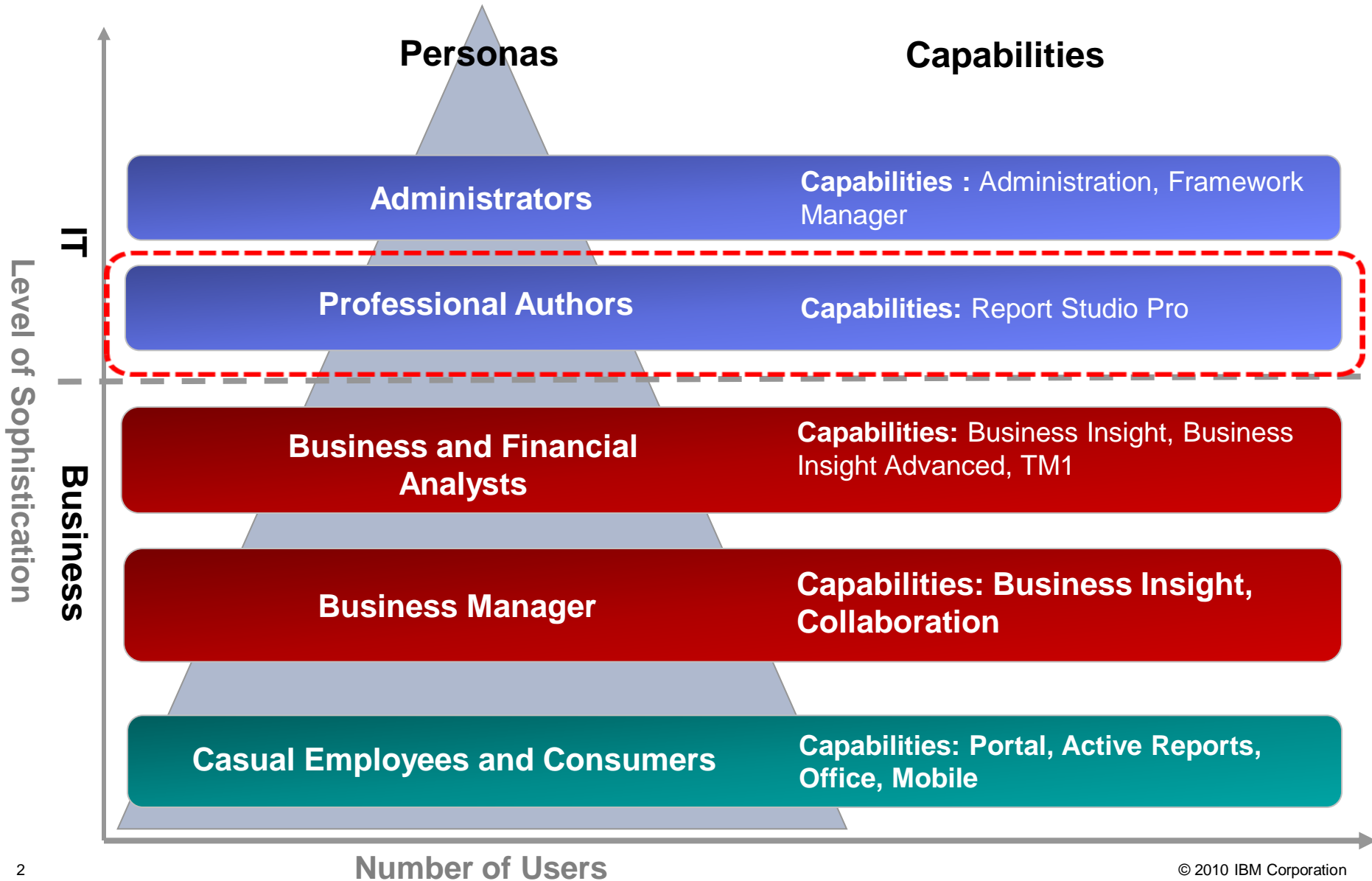


IBM Cognos Statistics



Business Analytics software

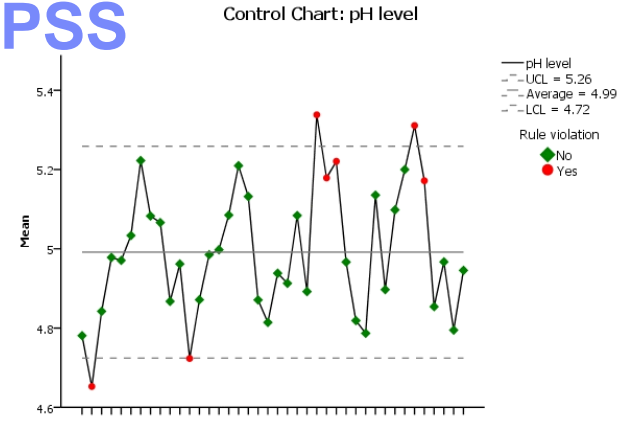
Cognos 10 – Spectrum of Business Analytics Users



IBM Cognos Statistics – Powered by SPSS

What is Cognos Statistics?

- Wizard-driven approach for Professional Authors to add a subset of commonly used SPSS statistical functions into Cognos 10 to include in reports and dashboards



Key Capabilities

- **Statistical process Control** - Improve operational quality and cost control using **Control charts** with production shift performance to clarify the differences in product quality
- **Data Analysis and testing** - Focus marketing demand generation programs by identifying global buying patterns by using **regression** and **correlation** analysis of regional performance.
- **Insight into the distribution and shape of data** - Increase Sales and Customer profitability using **histogram**, **boxplot** and **descriptive tables** to identify key customer demographics

Benefits

- Support key organizational decisions with fact based statistical evidence delivered within the BI environment
- Gain insight and confidence with critical statistical evidence readily available to all front-line decision makers
- Drive business decisions by integrating advanced analytical calculations within proven business analytics infrastructure

Business Drivers for Statistics

Use Cases and Examples

- See proof that proper statistical evidence is being used to support decision making using common statistical functions
 - Example: Identify the impact of demand generation marketing programs on quarterly buying patterns

- Visualize statistical results to more easily identify patterns and outliers
 - Example: Histogram charts to understand profiles of where employee performance is deviating outside of means

- Incorporate statistical results with business reporting
 - Example: Distribute and share information around operational quality that correlates operational quality with different shifts and products

Differences between Statistics and Data Mining

Statistical Analysis	Data Mining
<p>To draw conclusions or insights & determine cause-and-effect patterns between events from a sample of data.</p> <ul style="list-style-type: none">▪ Based on sample poll, predict election winner▪ Which advertising medium drives better sales▪ How does the use of cell phones vary by age	<p>Uncovers relationships & patterns within large volumes of data that can be used to predict behaviour and events</p> <ul style="list-style-type: none">▪ What customers are likely to leave?▪ Which files should be investigated for fraud?▪ Which products sell best together?
Smaller data sets (thousands of records)	Large data sets (millions of records)

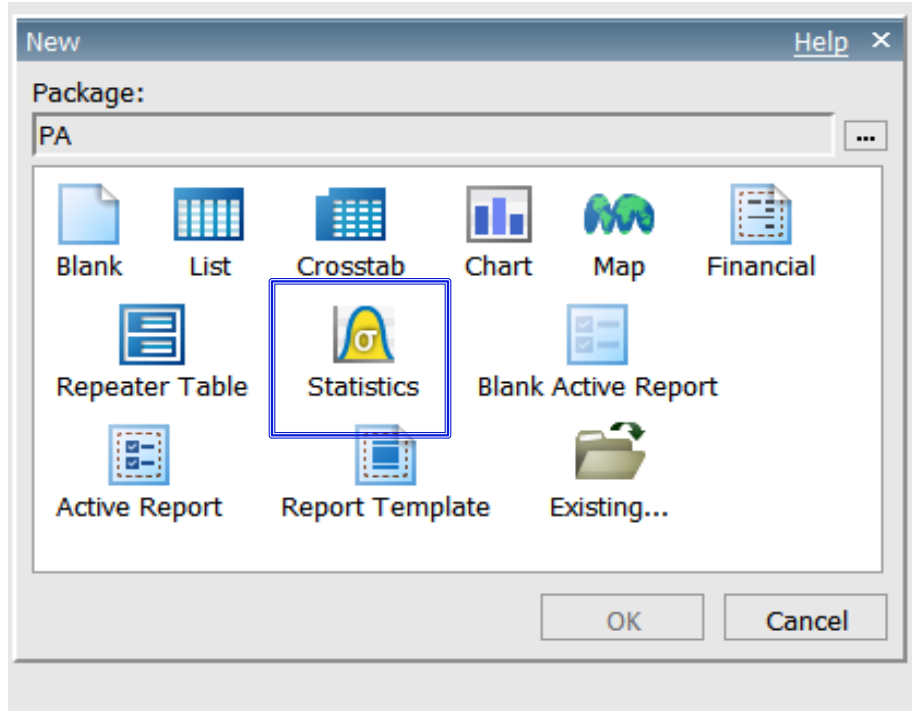
Differences between Cognos Statistics and SPSS Statistics

IBM Cognos Statistics	SPSS Statistics Workbench
For LOB Analysts & Prof. Report Authors to incorporate a subset of statistical functions into their reporting environment	For the specialist Statistical Analyst for deep-level statistical analysis
Seamlessly integrated within Report Studio	Stand alone workbench
Subset of commonly used statistical functions	Full range of statistical functions
Supports all IBM Cognos platform data sources	Support for SPSS statistic data sources and platforms

Statistics – Report Studio User Interface and Options

Key Capabilities

- Improve overall operational quality and efficiency using **Control charts**
- Identify global buying patterns by using **regression** and **correlation** analysis
- Provide more accurate forecasts based upon historical results using **regression analysis**
- Gain insight into the distribution and shape of data using **histogram**, **boxplot** and **descriptive tables**
- Easy to use wizards guide users through the process creating statistical outputs
- Statistical items are labeled using common BI terminology



Statistical Reporting for Operation Processes

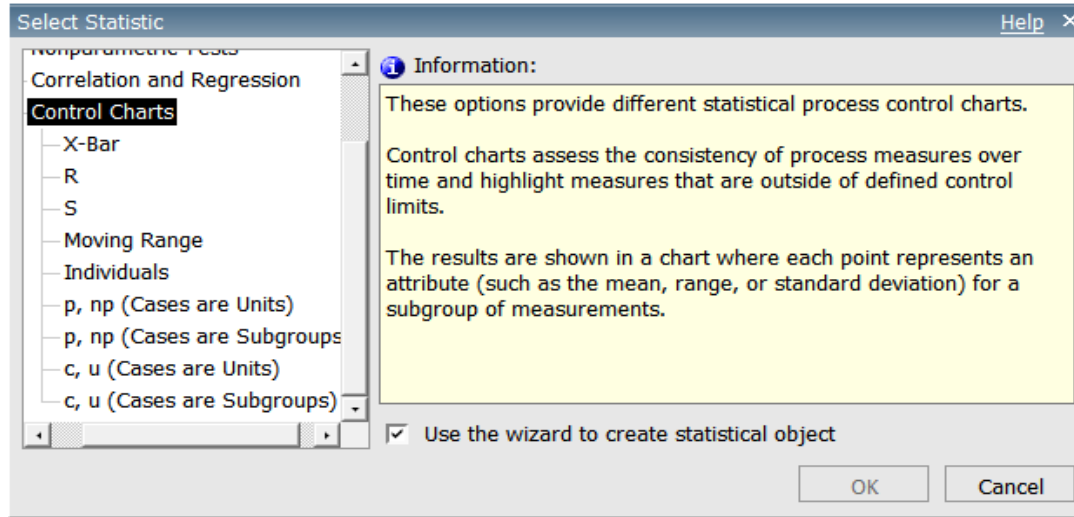
Business Scenario and Background

- Shampoo Manufacturing line
 - Standard Ph is supposed to be 5
 - Some variation is allowed, but within strict limits.
 - We are unhappy with the number of samples out of range but we are unsure how bad the problem is

Question to Answer

- Can basic BI answer our question?
- Can the new statistical options do a better job?

Control Charts

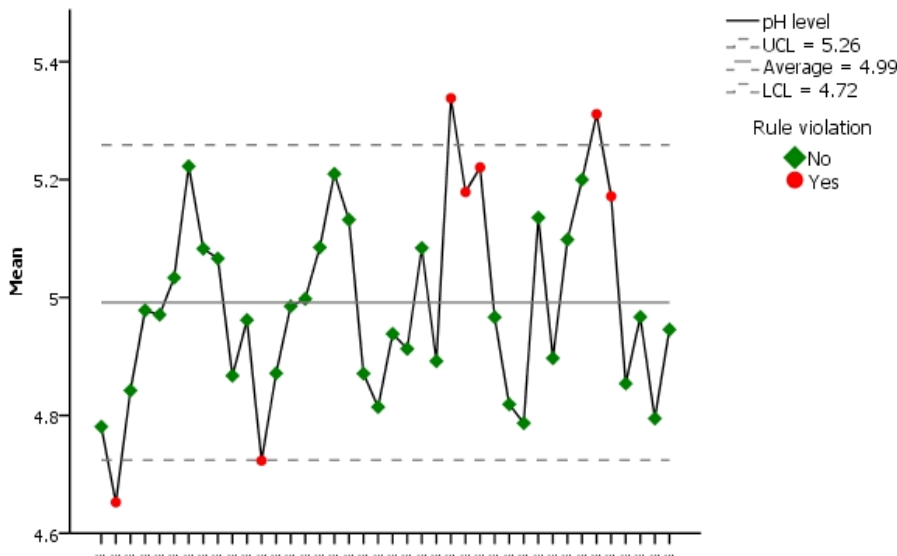


- Determine if a key process is “out of control”
- Valuable any time there is a process with certain standards that should be met
- Primarily used for six sigma and other quality standards
 - Very common in manufacturing
- Eliminate undesirable variations, improving your overall operational efficiency

Basic X-Bar Variable Control Chart

- Very common control chart – shows actual values
- Flags failure to meet specifications

Control Chart: pH level



Rule Violations

7 points violate control rules.

Time of measurement	Violations for Points
2	Less than -3 sigma
2	2 points out of the last 3 below -2 sigma
12	Less than -3 sigma
25	Greater than +3 sigma
26	2 points out of the last 3 above +2 sigma
27	2 points out of the last 3 above +2 sigma
35	Greater than +3 sigma
35	2 points out of the last 3 above +2 sigma
36	2 points out of the last 3 above +2 sigma

Statistical Reporting for Correlation & Regression

Business Scenario and Background

- Is there a strong correlation between sales of jewelry and sales of women's clothing?
- Is there a strong correlation between the number of catalogs mailed and the total sales of women's clothing?
- If we increase the number of catalog mailings, how much of a change of sales might we expect?"

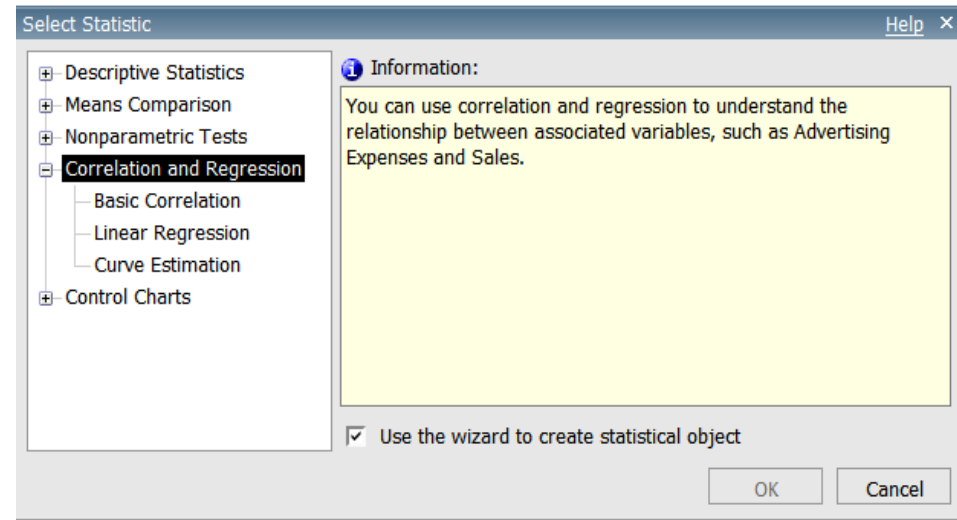
Question to Answer

- Same as before – How can Statistics make answering these types of questions easier?

Correlation and Regression

Correlation:

- A simple measure of association between two variables
- Determines if two variables are related
- Is there a significant correlation between sales revenue and radio advertising?

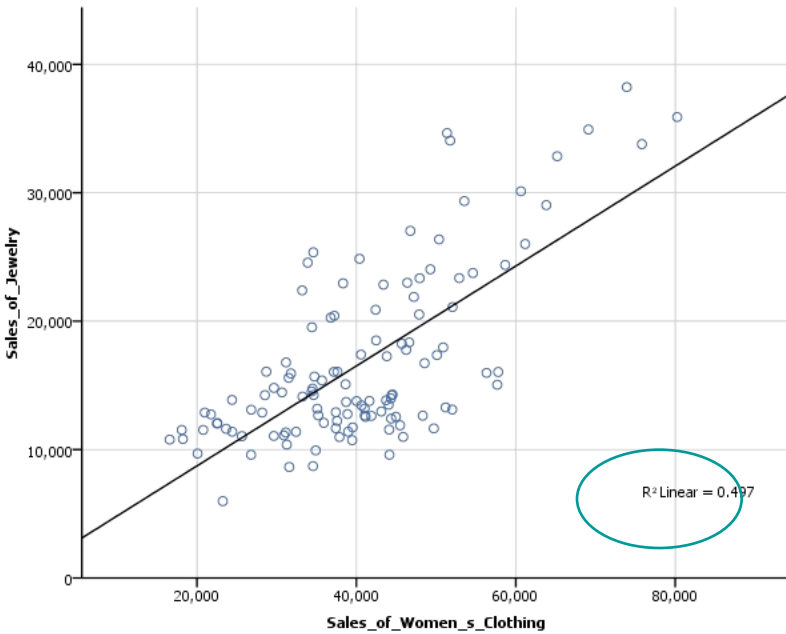


Regression Analysis:

- Examines the relationship between one dependent and one independent variable
- Can predict changes to a dependent variable when an independent variable is changed
- How much additional revenue can I expect if I increase radio advertising by 20%?

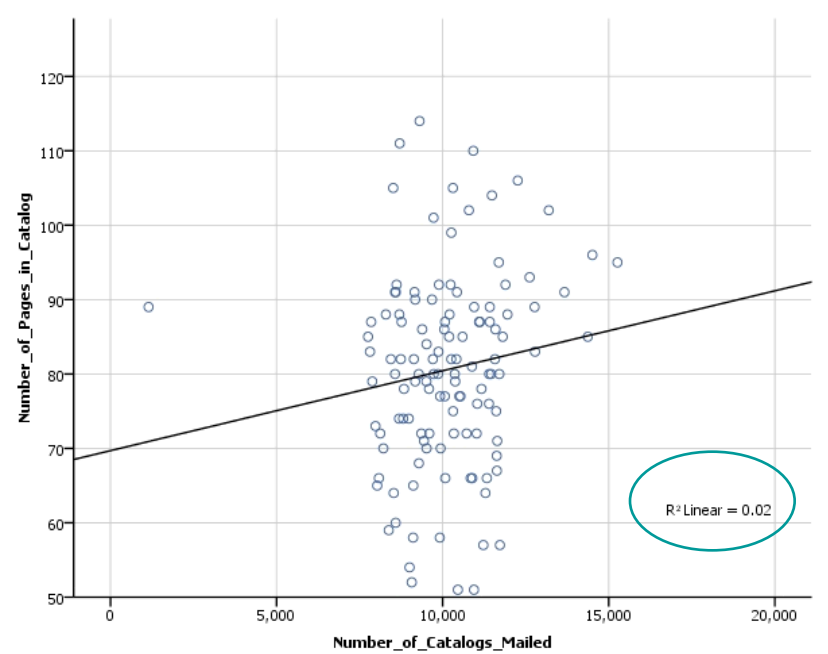
Basic Correlation

- Correlation between -1 and +1 (0 is not correlated)



Correlations

		Sales of Women's Clothing	Sales of Jewelry
Sales of Women's Clothing	Pearson Correlation	1	.705 ^(**)
	Sig. (2-tailed)		.000
	N	120	120
Sales of Jewelry	Pearson Correlation	.705 ^(**)	1
	Sig. (2-tailed)	.000	

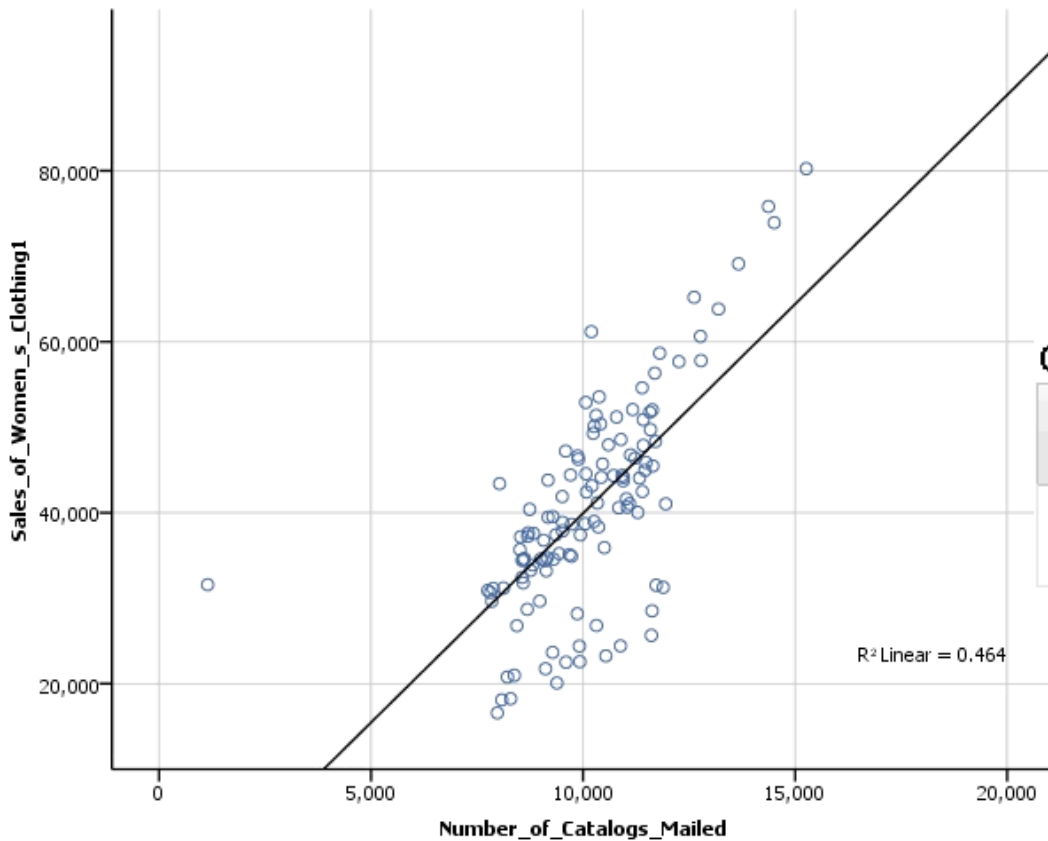


Correlations

		Number of Catalogs Mailed	Number of Pages in Catalog
Number of Catalogs Mailed	Pearson Correlation	1	.140
	Sig. (2-tailed)		.127
	N	120	120
Number of Pages in Catalog	Pearson Correlation	.140	1

Linear Regression

- Used to predict an effect on a dependent variable based on the change in a set of independent variables



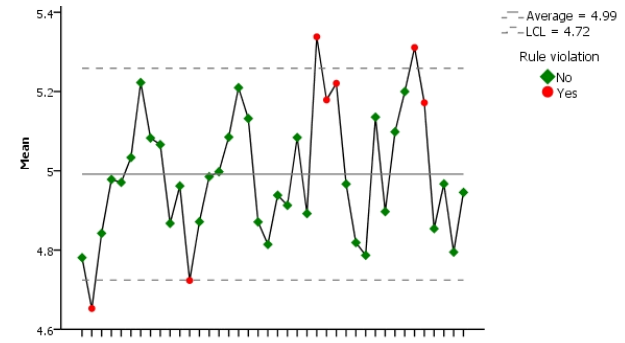
Coefficients⁽¹⁾

Model	Unstandardized Coefficients		t	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
	B	Std. Error				
1 (Constant)	-8999.716	4972.231	-1.810	.073		
Number of Catalogs Mailed	4.894	.484	10.110	.000		

Summary – IBM Cognos Statistics – Powered by SPSS

What is Cognos Statistics?

- Wizard-driven approach for Professional Authors to add a subset of commonly used SPSS statistical functions into Cognos 10 to include in reports and dashboards



Key Capabilities

- **Statistical process Control** - Improve operational quality and cost control using **Control charts** with production shift performance to clarify the differences in product quality
- **Data Analysis and testing** - Focus marketing demand generation programs by identifying global buying patterns by using **regression** and **correlation** analysis of regional performance.
- **Insight into the distribution and shape of data** - Increase Sales and Customer profitability using **histogram**, **boxplot** and **descriptive tables** to identify key customer demographics

Benefits

- Support key organizational decisions with fact based statistical evidence delivered within the BI environment
- Gain insight and confidence with critical statistical evidence readily available to all front-line decision makers
- Drive business decisions by integrating advanced analytical calculations within proven business analytics infrastructure