# Summary and Highlights

In this lesson, you have learned the following information:

Statistics is a branch of mathematics dealing with the collection, analysis, interpretation, and presentation of numerical or quantitative data.

Statistical Analysis involves the use of statistical methods in order to develop an understanding of what the data represents.

Statistical Analysis can be:

* Descriptive; that which provides a summary of what the data represents. Common measures include Central Tendency, Dispersion, and Skewness.
* Inferential; that which involves making inferences, or generalizations, about data. Common measures include Hypothesis Testing, Confidence Intervals, and Regression Analysis.

Data Mining, simply put, is the process of extracting knowledge from data. It involves the use of pattern recognition technologies, statistical analysis, and mathematical techniques, in order to identify correlations, patterns, variations, and trends in data.

There are several techniques that can help mine data, such as, classifying attributes of data, clustering data into groups, establishing relationships between events, variables, and input and output.

A variety of software and tools are available for analyzing and mining data. Some of the popularly used ones include Spreadsheets, R-Language, Python, IBM SPSS Statistics, IBM Watson Studio, and SAS, each with their own set of characteristics, strengths, limitations, and applications.

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In this lesson, you have learned the following information:

Data has value through the stories that it tells. In order to communicate your findings impactfully, you need to:

* Ensure that your audience is able to trust you, understand you, and relate to your findings and insights.
* Establish the credibility of your findings.
* Present the data within a structured narrative.
* Support your communication with strong visualizations so that the message is clear and concise, and drives your audience to take action.

Data visualization is the discipline of communicating information through the use of visual elements such as graphs, charts, and maps. The goal of visualizing data is to make information easy to comprehend, interpret, and retain.

For data visualization to be of value, you need to:

* Think about the key takeaway for your audience.
* Anticipate their information needs and questions, and then plan the visualization that delivers your message clearly and impactfully.

There are several types of graphs and charts available for you to be able to plot any kind of data, such as bar charts, column charts, pie charts, and line charts.

You can also use data visualization to build dashboards. Dashboards organize and display reports and visualizations coming from multiple data sources into a single graphical interface. They are easy to comprehend and allow you to generate reports on the go.

When deciding which tools to use for data visualization, you need to consider the ease-of-use and purpose of the visualization. Some of the popularly used tools include Spreadsheets, Jupyter Notebook, Python libraries, R-Studio and R-Shiny, IBM Cognos Analytics, Tableau, and Power BI.