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Basic Data Visualization – Method 1

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Introduction

Data Visualization is representation of data or information by using charts, graphs and maps. It provides easy way to understand outlier, trend and pattern hidden in the data which cannot be understood by simple looking at the data tables.

Evolution of Internet and data storing capabilities enabled us to store and collect data. To access information from this data, Data visualization has become an important part of our everyday life. Various types of charts are available to solve explanatory (i.e. reporting and communicating data to end users) or exploratory (i.e. researching and analysing data to better understand it for yourself). Data visualizations make big and small data easier for the human brain to understand, and visualization also makes it easier to detect patterns, trends, and outliers in groups of data. Good data visualizations should place meaning into complicated datasets so that their message is clear and concise.

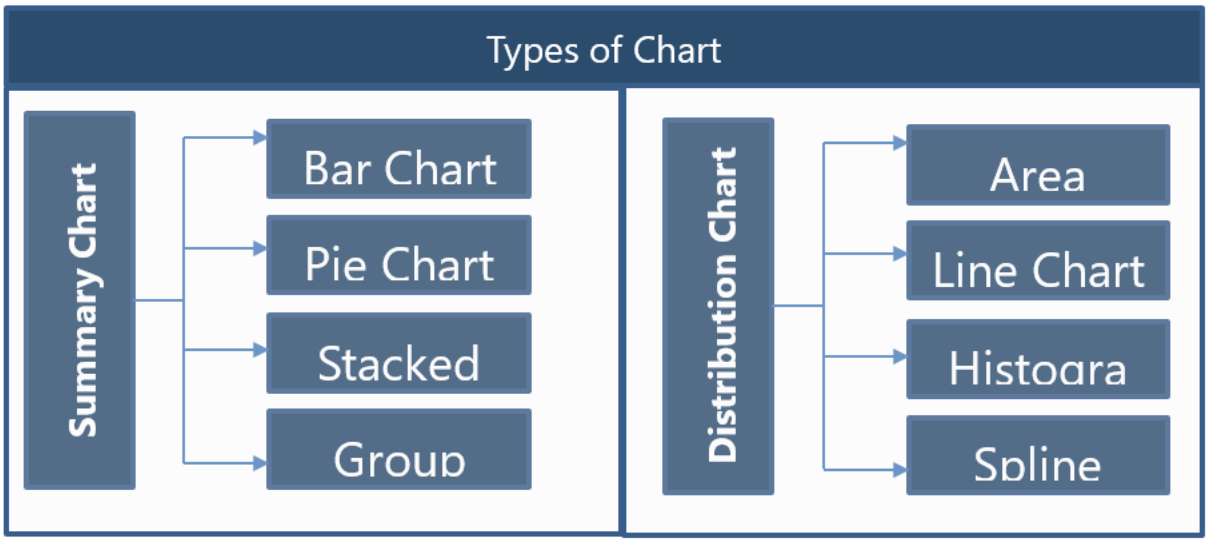
However, variety can also cause confusion, making it difficult to clearly understand the purpose of each form of data visualization. As a result, when an inappropriate type of chart is applied to data, the user not only might be confused by the information, but, more importantly, could make bad decisions based on such a presentation. Hence it is important to understand when to use what type of chart for representing data. In this chapter we are going to learn about different types of charts and their categories as given below.

Categorization of Charts/Graphs

The charts can be divided based on the number of input variables which can be given as:

Univariate	Bivariate	Multivariate
• Bar Chart • Pie Chart • Histogram • Density plot • Spline Chart	• Stacked Bar Chart • Horizantal group chart • Barline Graph	• Multiline Charts

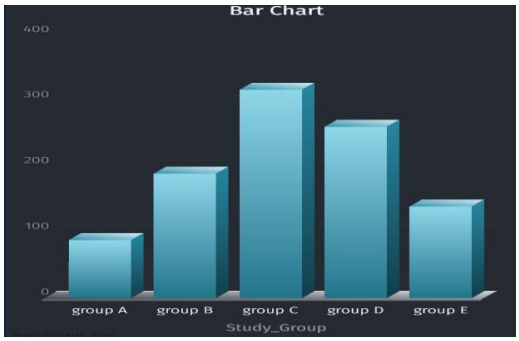
We can also divide these charts based on the representation of the output type.



Details of Charts and their Types

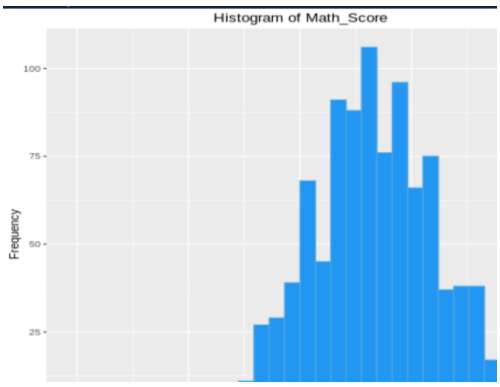
Bar Charts

A Bar Chart is a way of summarizing a set of categorical data. It is better to convert continuous data to bins before plotting. The bar chart displays data using several bars, each representing a particular category. The height of each bar is proportional to a specific aggregation (for example the sum of the values in the category it represents).



Histograms

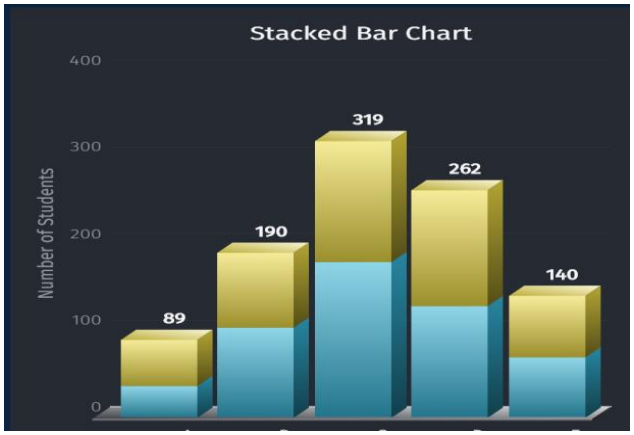
Histogram is the graph which shows the underlying frequency distribution (shape) of a set of continuous data. This chart is helpful in data collection and data analysis and hence it is widely used in analytics industry. By plotting it allows to inspect the overall distribution of the data, outlier, skew present in the data.



Stacked Bar Charts

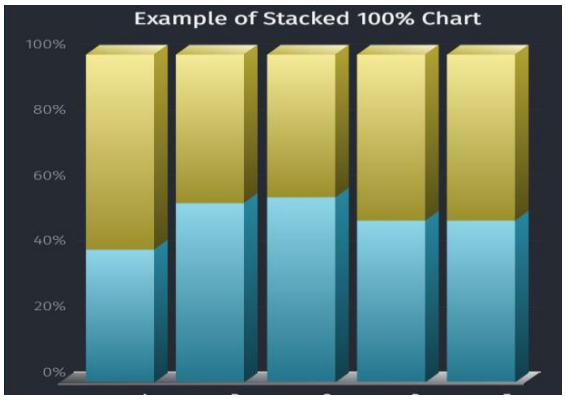
Bar chart compares individual category, however Stacked bar charts are designed to help you simultaneously compare totals and notice sharp changes at the category level that are likely to have the most influence on movements in category totals.

In the simple stacked bar chart one category value is placed against the another. The total value of bar is addition of all segments together.



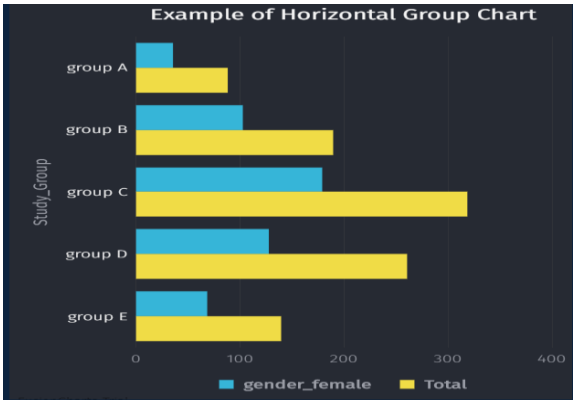
Stacked 100% Charts

Stacked 100 % Chart is another form of stacked charts. The only difference between stacked bar chart and stacked 100% chart is that it shows the percentage-of-the-whole of each group and are plotted by the percentage of each value to the total amount in each group. This makes the relative comparison easy.



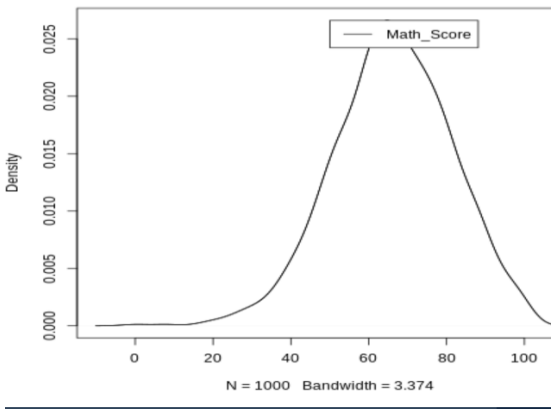
Horizontal Group Charts

If we unstack each bar on the primary and place them besides each other on the base line as sub-bars, we would get the grouped chart. Group chart are also called as clustered chart.



Density Plots

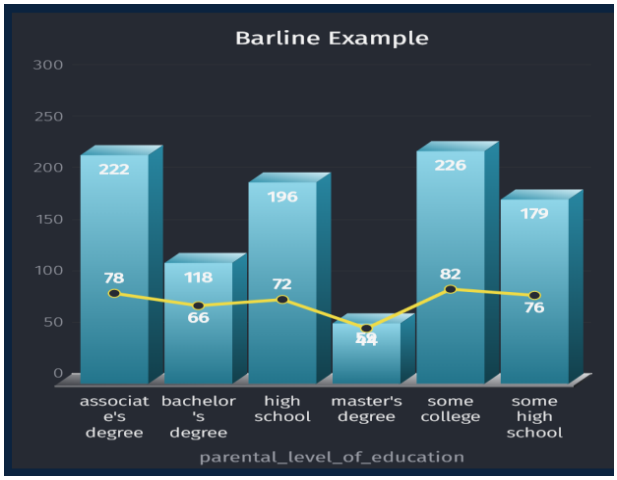
Like Histogram, density plot visualises the distribution of data over a continuous interval or time period. This chart is a variation of a Histogram that uses kernel smoothing to plot values, allowing for smoother distributions by smoothing out the noise.



Barline Charts

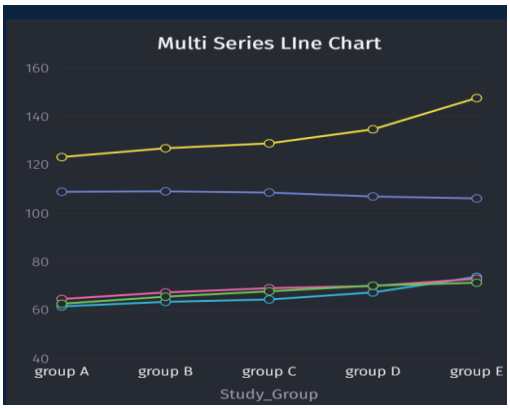
The Barline chart is nothing but combination of two simple charts which are Bar and line chart. Bar charts are great for comparing two or more values that are related categorically and Line charts are ideal for showing data trends

Bar-Line charts show two metric values aggregated across a group dimension. They are useful for showing quantity alongside changes in trends over group value.



Multiseries Line Chart

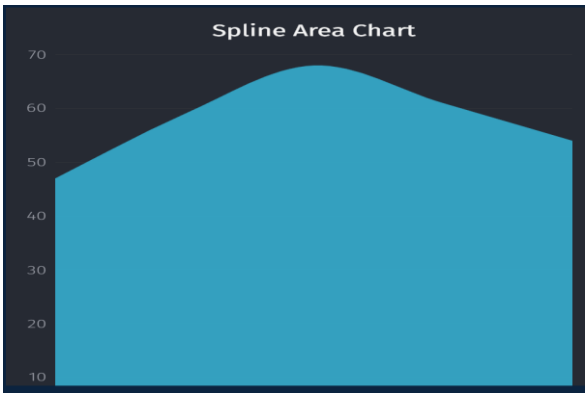
Multiseries line chart is extension of simple line chart. This chart is plotted with multiple line graphs on the same scale to set the comparison trend between the different datasets.



Spline Area Chart

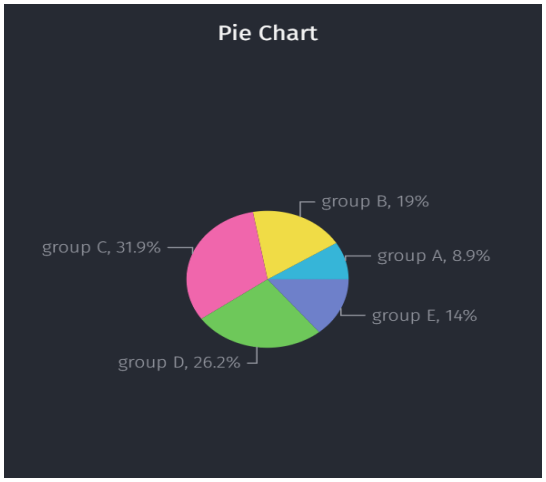
A spline area chart is an area chart in which data points are connected by smooth curves: this modification is aimed to improve the design of a chart.

Like in the regular area chart, the area between the line segments and the X-axis is filled with colour or a pattern to emphasize the magnitude of change over time.



Pie Charts

Pie chart is the best chart to depict the composition of some categorical variable. It's easier to spot percentages in a pie chart than in a stacked bar or column chart.



Data Visualization Summary

Charts	Variable Type	Purpose
Bar Chart	Univariate	Present frequencies or proportions
Pie Chart	Univariate	Present frequencies or proportions
Stacked Bar Chart	Bivariate	Compares composition with actual values
Stacked 100% Chart	Bivariate	Compares composition proportions within groups
Horizontal Grouped Chart	Bivariate	Compares proportion within groups
Histogram	One Scale	Shows distribution of results
Area Chart	Scale by Time	Comparison of relative change over time
Density Plot	One Scale	Shows distribution of results after smoothing of curve
Line Chart	Scale by Time	Displays changes over time and comparison of groups
Barline Chart	Categorical and Scale	Comparing two or more values that are related

	by Time	categorically

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