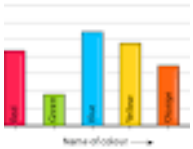
AI generate: “Please generate Python code to render a *** chart using ***”

Bar Charts



Usage: Represents data with rectangular bars. The length of each bar is proportional to the value it represents. They can be vertical or horizontal. For example, comparing sales of different products in a store.

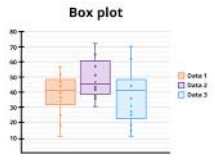
Advantages:

- Easy to understand and widely used
- Effective for comparing individual or multiple data series
- Efficient in displaying data across various categories

Disadvantages:

- Not ideal for showing patterns or trends over time
- Can become cluttered when comparing too many categories

Box Plots



Usage: Box plots summarize a dataset using quartiles. The "box" shows the interquartile range, while "whiskers" indicate variability outside the upper and lower quartiles. For example, comparing sales performance of different teams.

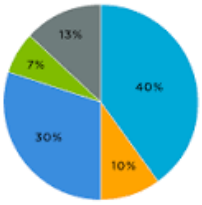
Advantages:

- Quickly visualizes data spread and skewness
- Identifies outliers

Disadvantages:

- Not suitable for detailed distribution analysis
- Does not show frequency of data distribution

Pie Charts



Usage: Represents data as a circle, with individual slices representing parts of the whole. For example, displaying market shares of different companies in an industry.

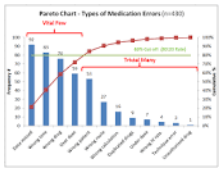
Advantages:

- Simple visualization showing the relationship between parts and the whole
- Clear depiction of proportions
- Effective when there are a limited number of categories

Disadvantages:

- Not effective for comparing individual categories
- Becomes less effective and harder to interpret with too many slices
- Does not show absolute values, only proportions

Pareto Charts



Usage: Pareto charts combine bar and line graphs to represent the cumulative frequency of events. They identify the most significant factors in a dataset. For example, identifying the most frequent product defects.

Advantages:

- Effective in highlighting the most important factors in large datasets
- Aids in prioritizing efforts

Disadvantages:

- Limited to datasets where ranking and prioritization are relevant

Not suitable for showing relationships between data points

Line Graphs

Usage: Line graphs display data points connected by straight lines, mainly used to visualize values over a continuous period or time. For example, tracking a company’s revenue growth over several years.

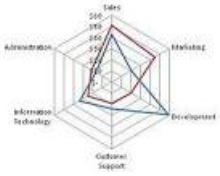
Advantages:

- Effective in showing trends over time
- Can compare multiple data series on one graph
- Clear visualization of data points and intervals

Disadvantages:

- Not suitable for showing the relationship between parts and the whole
- Can become cluttered with too many data series
- Requires meaningful order in data

Radar Charts



Usage: Radar charts represent data in a 2D chart of three or more quantitative variables. Data points are plotted on axes starting from the center. For example, comparing performance metrics of a product.

Advantages:

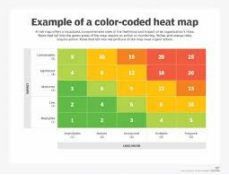
- Can compare multiple quantitative variables
- Provides an overview of data

Disadvantages:

- Can become cluttered when comparing too many datasets

Difficult to interpret with similar values

Heat Maps



Usage: Heat maps represent data in matrix form, where individual values are represented by color. The intensity of the color usually represents the value’s magnitude. For example, visualizing website visitor activity across different sections of a webpage.

Advantages:

- Quickly identifies patterns, correlations, and areas of concentration
- Uses color effectively to convey information about intensity

Disadvantages:

- Not suitable for detailed numerical analysis
- Color choice is critical; poor selection can be misleading

Treemaps

Usage: Treemaps display hierarchical data as nested rectangles. Each branch of the hierarchy is represented by colored rectangles. For example, visualizing storage usage on a computer.

Advantages:

- Efficient use of space
- Can represent multiple dimensions using size and color

Disadvantages:

- Not suitable for large hierarchies
- Can become confusing

Histograms

They estimate the probability distribution of a continuous variable. For example, displaying the age distribution in a population.

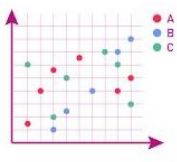
Advantages:

- Provides a visual interpretation of numerical data by showing the number of data points that fall within a specified range
- Helps identify patterns in data distribution

Disadvantages:

- Does not show exact values
- Number and width of bins can affect perception

Scatterplots



Usage: Scatterplots display the relationship between two variables. For example, using scatterplots to examine the relationship between height and weight of a group of people.

Advantages:

- Good for identifying relationships between two variables
- Clearly displays individual data points

Disadvantages:

- Difficult to identify patterns with too many data points

Not suitable for showing data over time or hierarchies

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