BUSINESS INTELLIGENCE

By Kushal P Wade

kushal.1889@gmail.com

VISUALIZATION ALGORITHMS :

- Power BI is a powerful data visualization tool that allows you to create interactive and insightful visualizations from your data.
- It offers various visualization algorithms and options to help you represent your data effectively.
- Power BI's visualization capabilities are continually evolving, and with each update, new algorithms and features may be introduced.

kushal.1889@gmail.com

VISUALIZATION ALGORITHMS :

- **Clustering:**
  - K-Means Clustering: Power BI supports K-Means clustering, which groups similar data points into clusters based on their attributes.
  - Hierarchical Clustering: Hierarchical clustering organizes data into a tree-like structure, creating nested clusters based on similarities.
- **Trend Lines:**
  - Linear Regression: Power BI can calculate and display linear regression trend lines to show the overall trend in your data.
  - Exponential Smoothing: This algorithm helps to forecast time-series data by applying weighted averages of past observations.

VISUALIZATION ALGORITHMS :

- **Anomaly Detection:**
  - Z-Score: Power BI allows you to calculate and visualize Z-scores to identify data points that deviate significantly from the mean.
  - Seasonal Decomposition: This algorithm helps detect seasonal patterns and trends in time-series data.
- **Decision Trees:**
  - Power BI supports the visualization of decision trees to represent classification or regression models in a hierarchical tree-like structure.
- **Clutter Reduction:**
  - Power BI uses various algorithms to automatically reduce visual clutter in your reports and dashboards, providing a clean and concise view of your data.

VISUALIZATION ALGORITHMS :

- **Geospatial Visualization:**
  - Power BI has built-in support for geospatial data and offers visualization algorithms to create maps, choropleth maps, and heatmaps.
- **Scatter Plots and Bubble Charts:**
  - Power BI allows you to create scatter plots and bubble charts to visualize relationships between two or more numerical variables.
- **Waterfall Charts:**

Waterfall charts in Power BI help visualize cumulative changes in data over a series of categories, such as financial statements.

VISUALIZATION ALGORITHMS :

- **Pareto Charts:**

  Pareto charts are used to identify the most significant factors contributing to a particular outcome, and Power BI supports them for easy analysis.

- **Box Plots:**

Power BI allows you to create box plots, also known as box-and-whisker plots, which display statistical information like quartiles, outliers, and distribution spread.

kushal.1889@gmail.com

VISUAL ENCODING:

- Visual encodings are fundamental components of data visualizations that translate data attributes into visual properties such as position, size, color, shape, and texture.
- They play a crucial role in conveying information effectively in a graphical format. By mapping data attributes to appropriate visual properties, visual encodings help users understand patterns, trends, and relationships in the data quickly.

kushal.1889@gmail.com

VISUAL ENCODING:

- **Position:**

The most accurate and powerful encoding, where data values are mapped to the spatial position on the chart. For example, the height of bars in a bar chart or the x-y coordinates of points in a scatter plot.

- **Size:**

Mapping data values to the size of graphical elements, such as circles or bars. Larger sizes represent higher values, while smaller sizes represent lower values.

- **Color:**

Using different colors or shades to represent data values. Color can be used for categorical data (distinct categories represented by different colors) or for continuous data (gradient color scales).

VISUAL ENCODING:

- **Shape:**

Using different shapes to represent categories or data points. Shapes can help distinguish between different groups in a scatter plot or other chart types.

- **Texture and Patterns:**

Patterns or textures can be used to represent different categories or data points, although they are less commonly used due to potential readability issues.

- **Orientation:**

The angle or direction of graphical elements can encode information, especially useful for representing ordered or sequential data.

kushal.1889@gmail.com

VISUAL ENCODING:

- **Connection:**

Visual encodings that show connections between data points, such as lines connecting related data points in a network diagram.

- **Opacity/Transparency:**

Varying the opacity or transparency of graphical elements to indicate the intensity or concentration of data values.

- **Length/Width:**

Using the length or width of graphical elements to represent data values, common in bar charts or histograms.

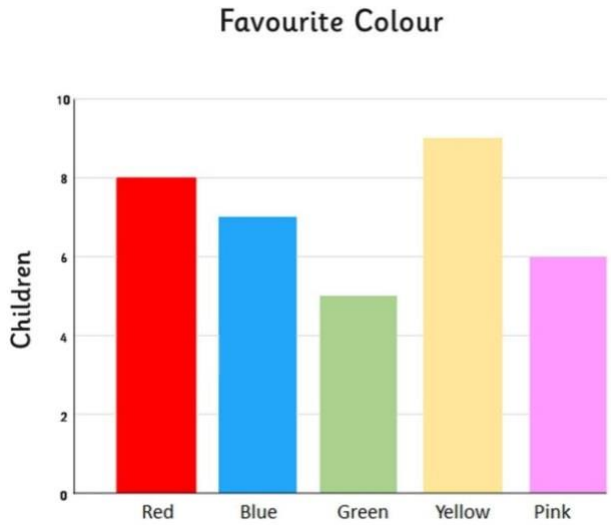
kushal.1889@gmail.com

TAXONOMY IN DATA VISUALIZATION

By Kushal P Wade

kushal.1889@gmail.com

COMPARISON CHARTS
1. BAR CHART



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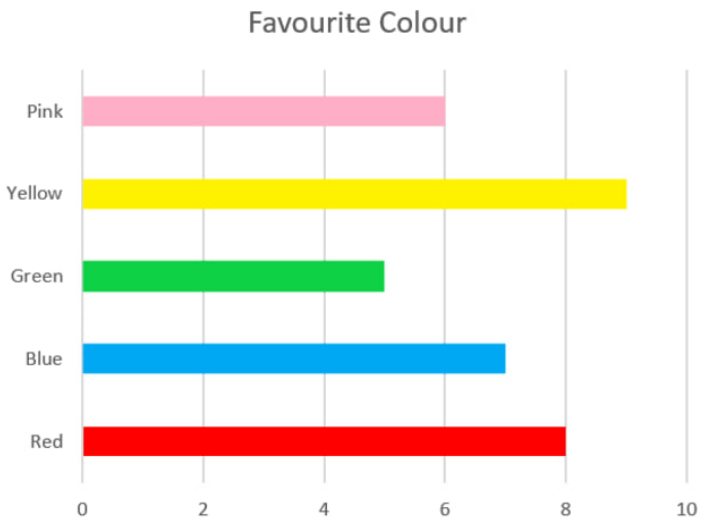
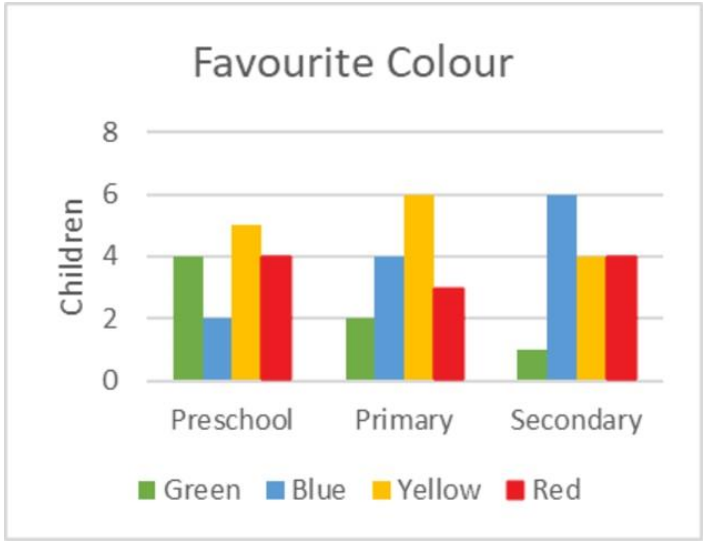
Horizontal Bar



Grouped Bar



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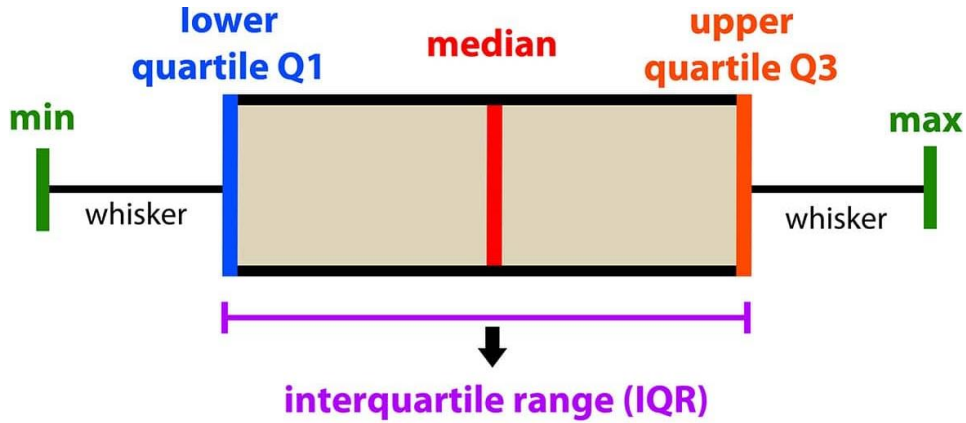
COMPARISON CHARTS
2. BOX PLOTS



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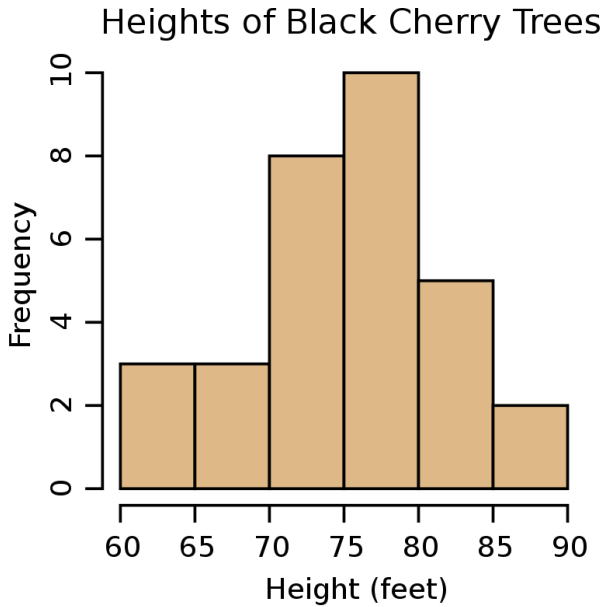
COMPARISON CHARTS
3. HISTOGRAM



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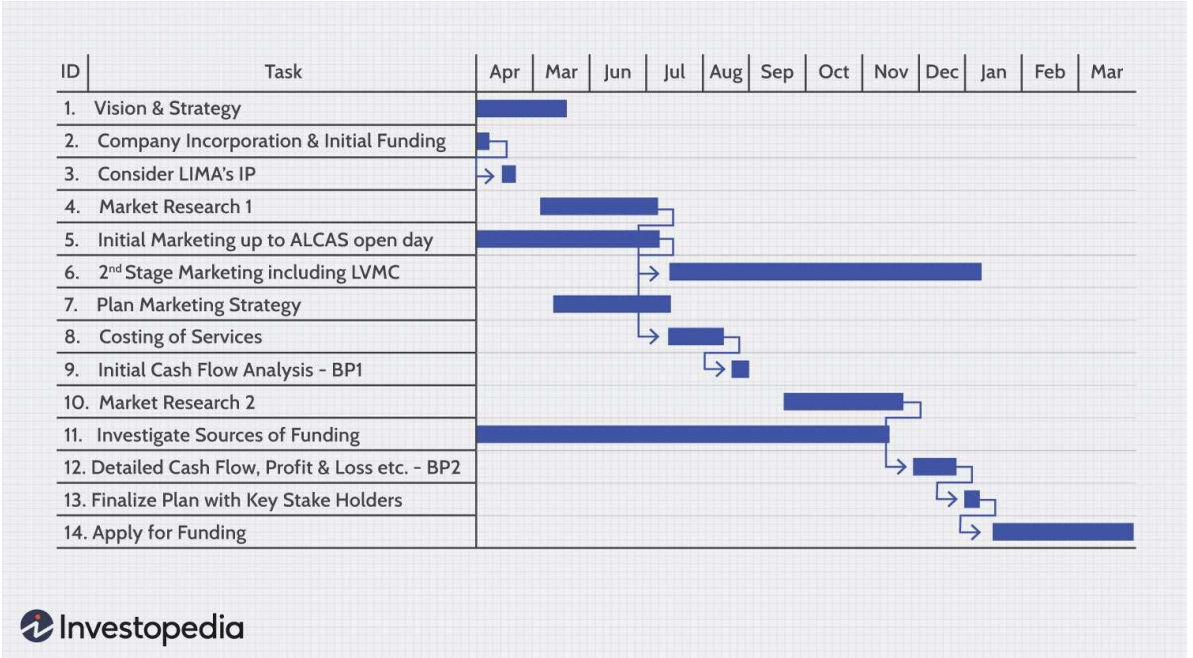
COMPARISON CHARTS
4. GANNT CHART



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COMPARISON CHARTS
5. GLYPH CHART

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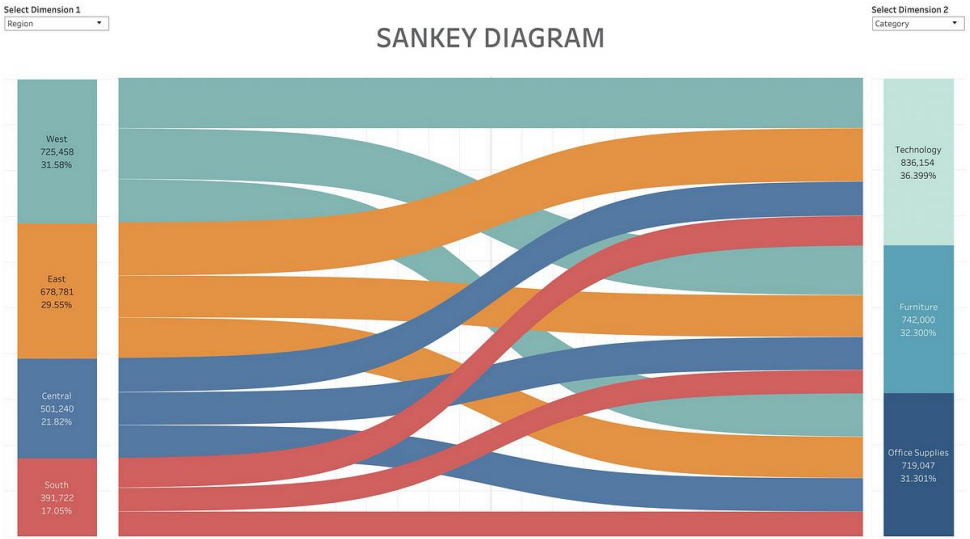
COMPARISON CHARTS
6. SANKEY DIAGRAM

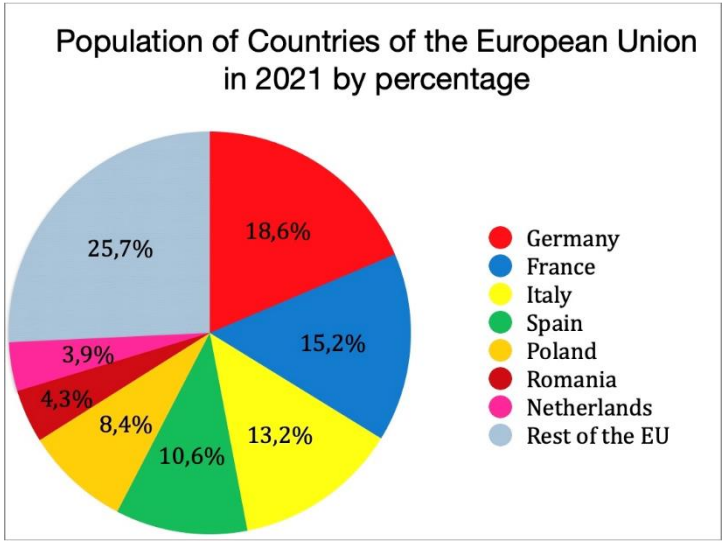


kushal.1889@gmail.com

COMPARISON CHARTS
7. WORD CLOUD

kushal.1889@gmail.com

RELATIONSHIP GRAPHS
1. PIE CHART



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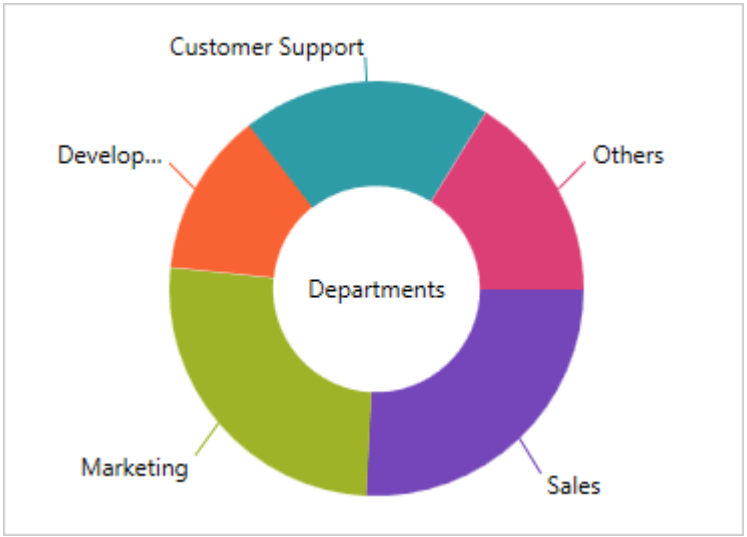
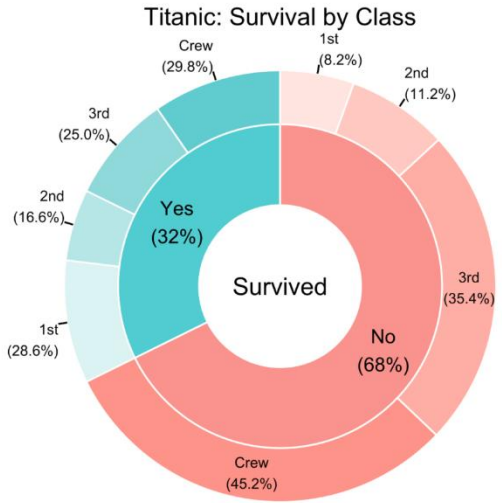
RELATIONSHIP GRAPHS
2. DOUGHNUT CHART





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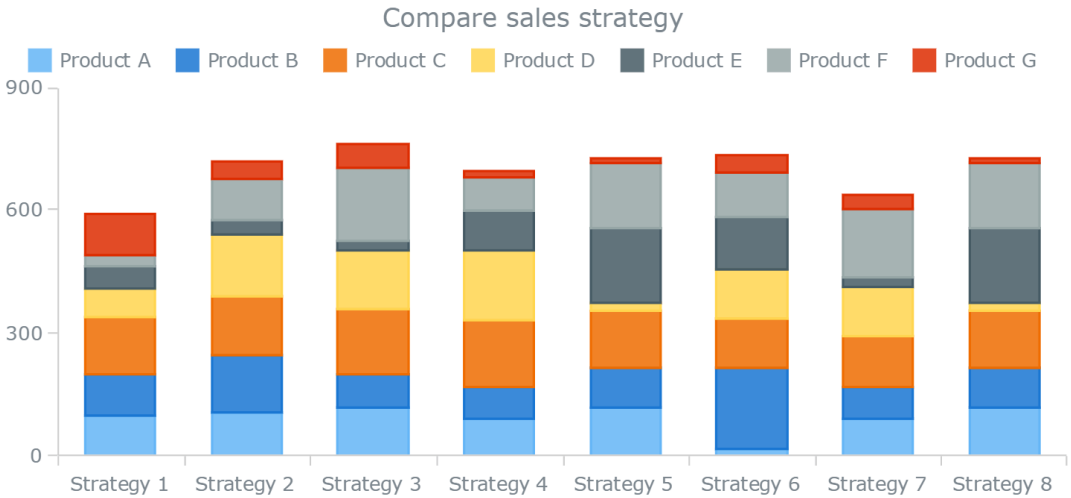
RELATIONSHIP GRAPHS
3. STACKED BAR CHART



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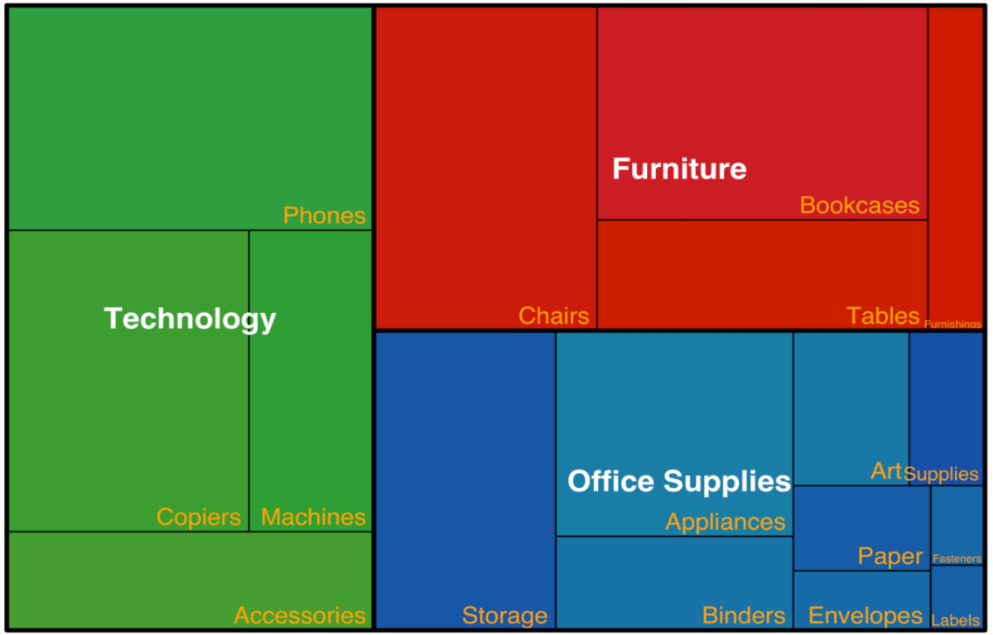
RELATIONSHIP GRAPHS
4. TREE MAP



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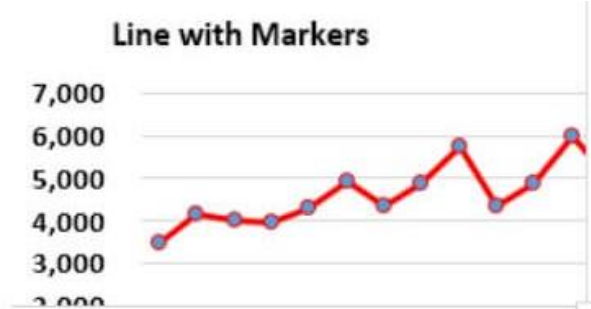
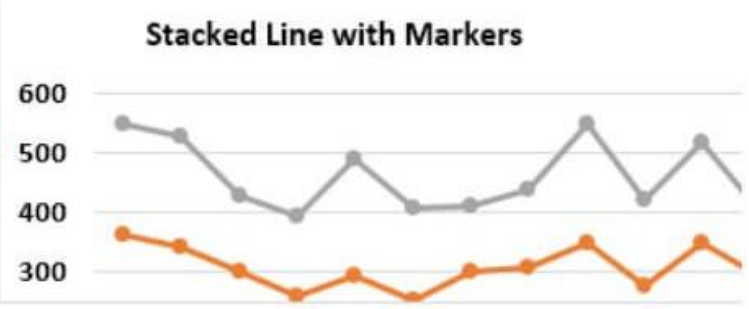
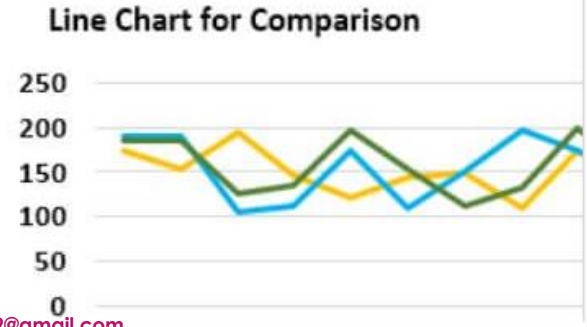
CHANGES WITH TIME
1. LINE CHART







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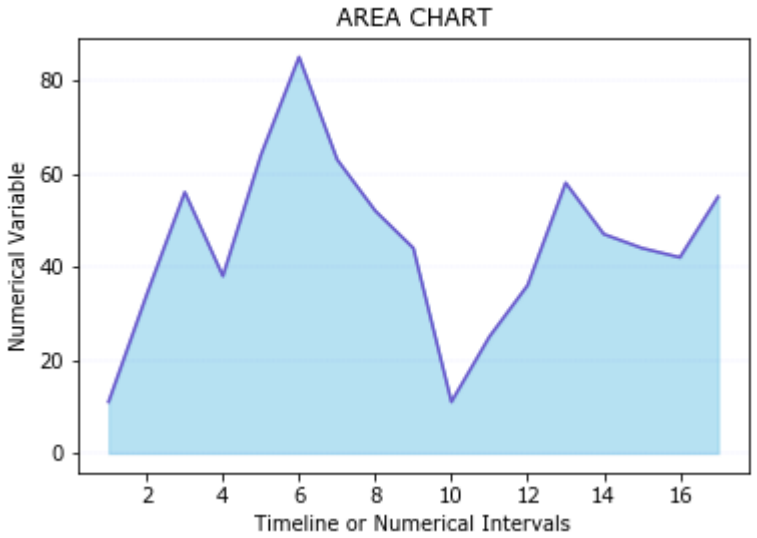
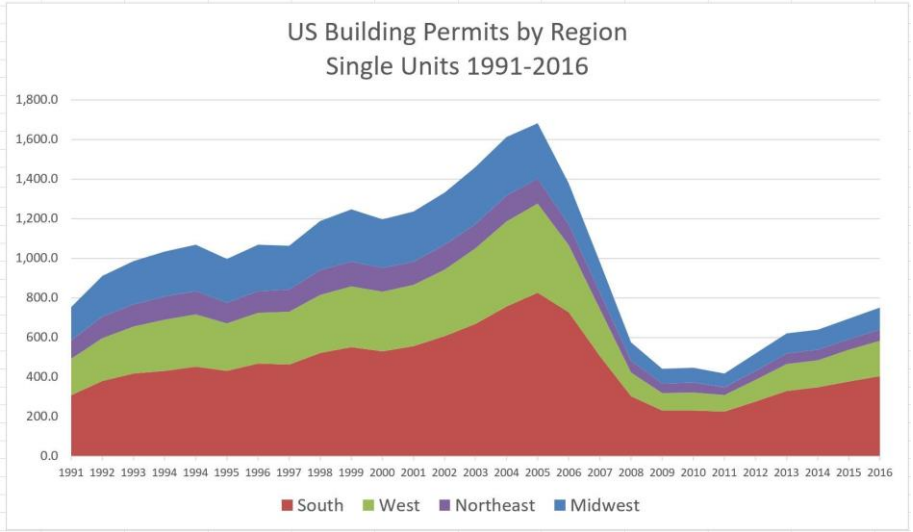
CHANGES WITH TIME
2. AREA GRAPH



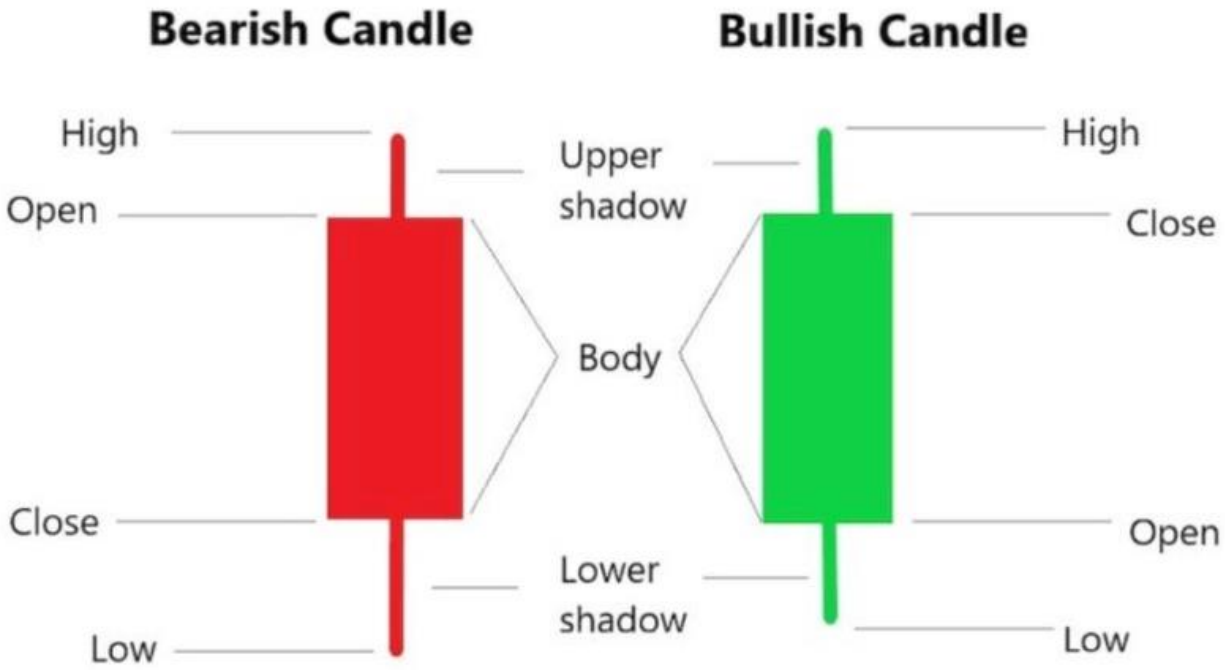


kushal.1889@gmail.com

CHANGES WITH TIME
3. SPARKLINE CHART

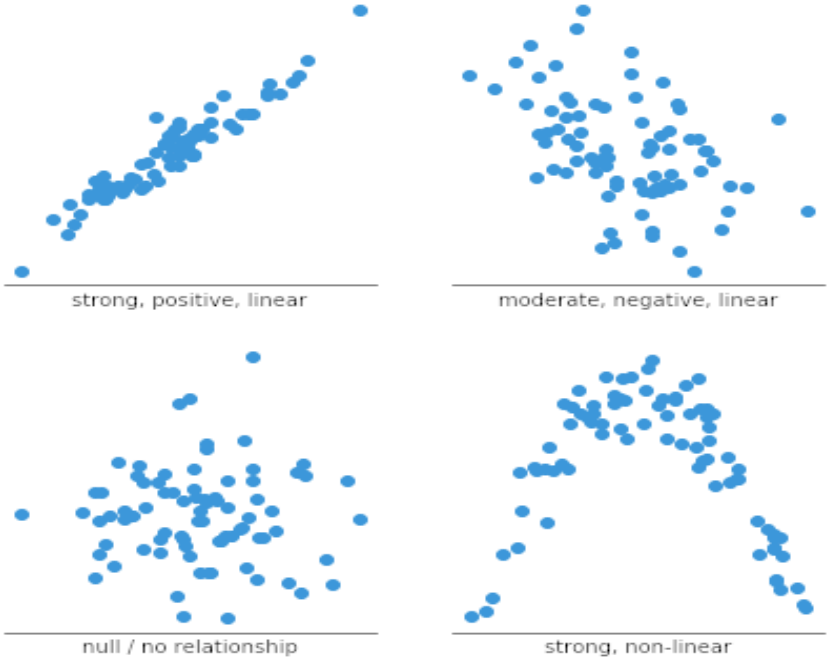
kushal.1889@gmail.com

CHANGES WITH TIME
4. CANDLESTICK CHART - OHLC



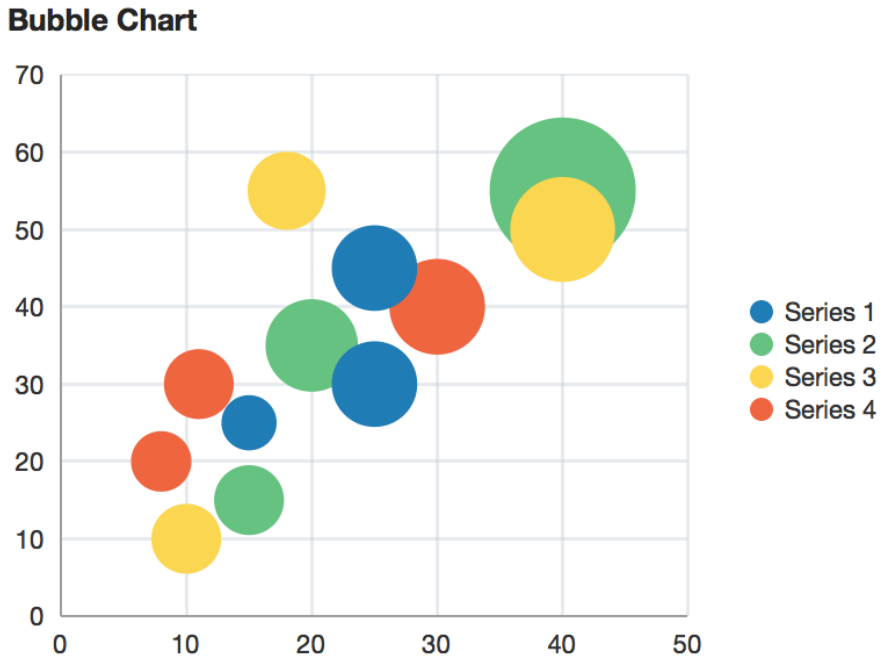
kushal.1889@gmail.com

CONNECTIONS & RELATIONSHIPS
1. SCATTER PLOTS



kushal.1889@gmail.com

CONNECTIONS & RELATIONSHIPS
2. BUBBLE PLOTS



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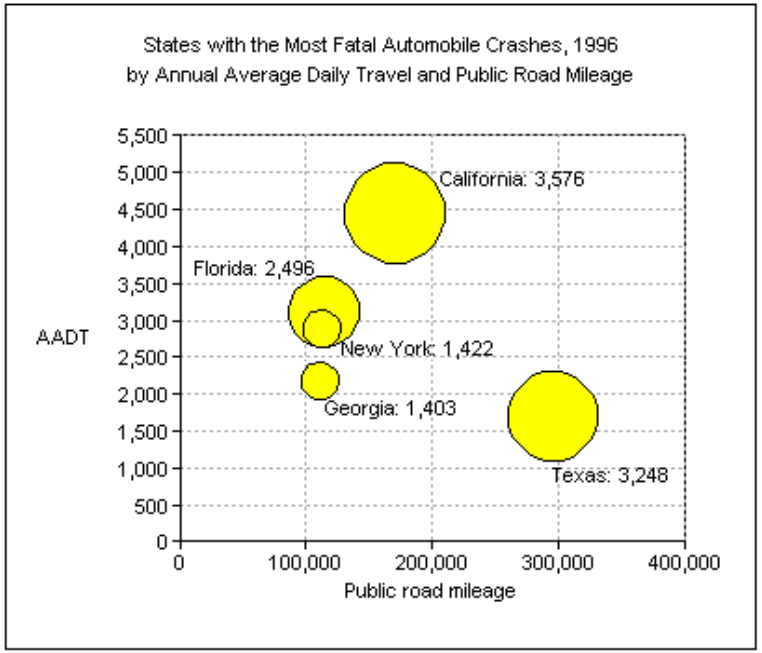
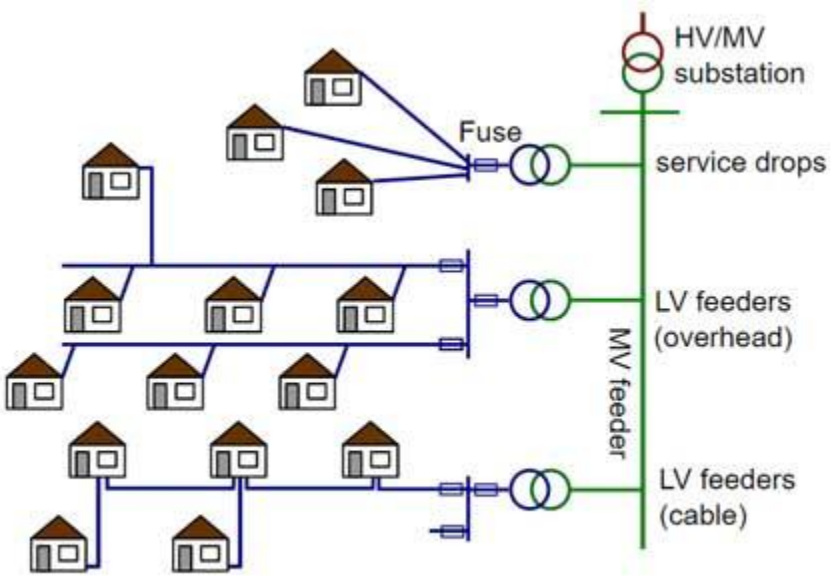
CONNECTIONS & RELATIONSHIPS
2. BUBBLE PLOTS



This chart shows the five states in which the highest number of fatal automobile accidents occurred in 1996. Grid lines extend from both value axes in this chart.

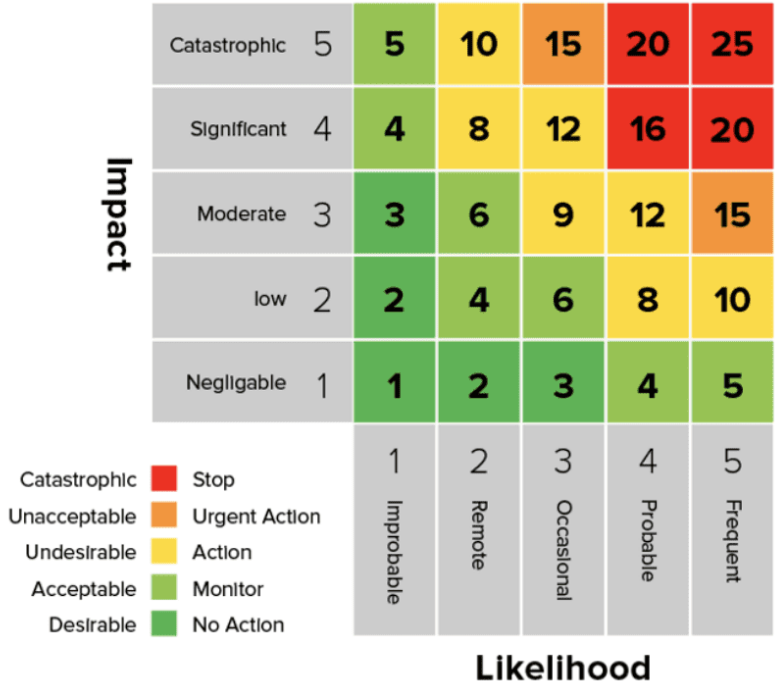
kushal.1889@gmail.com

CONNECTIONS & RELATIONSHIPS
3. RADIAL NETWORK



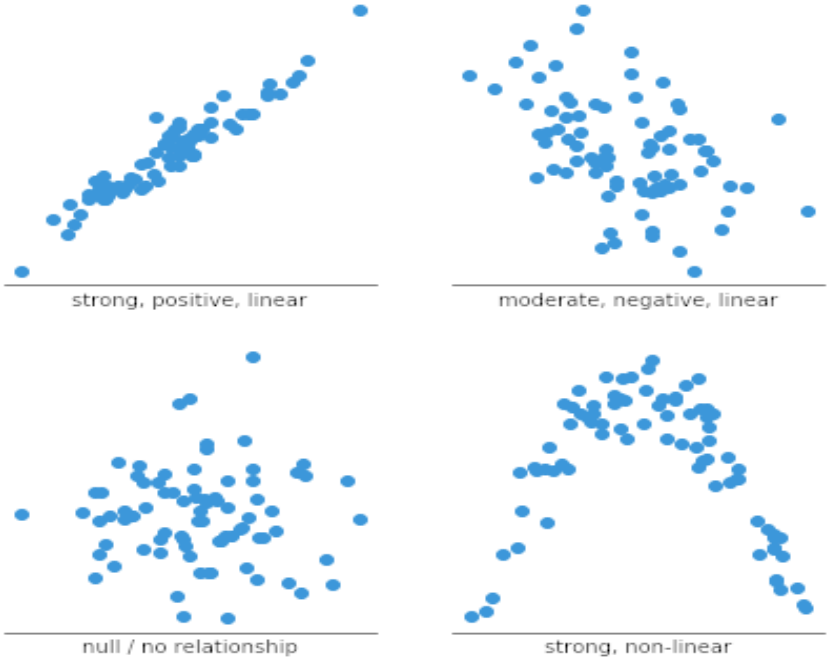
kushal.1889@gmail.com

CONNECTIONS & RELATIONSHIPS
4. HEAT MAP



kushal.1889@gmail.com

CONNECTIONS & RELATIONSHIPS
1. SCATTER PLOTS

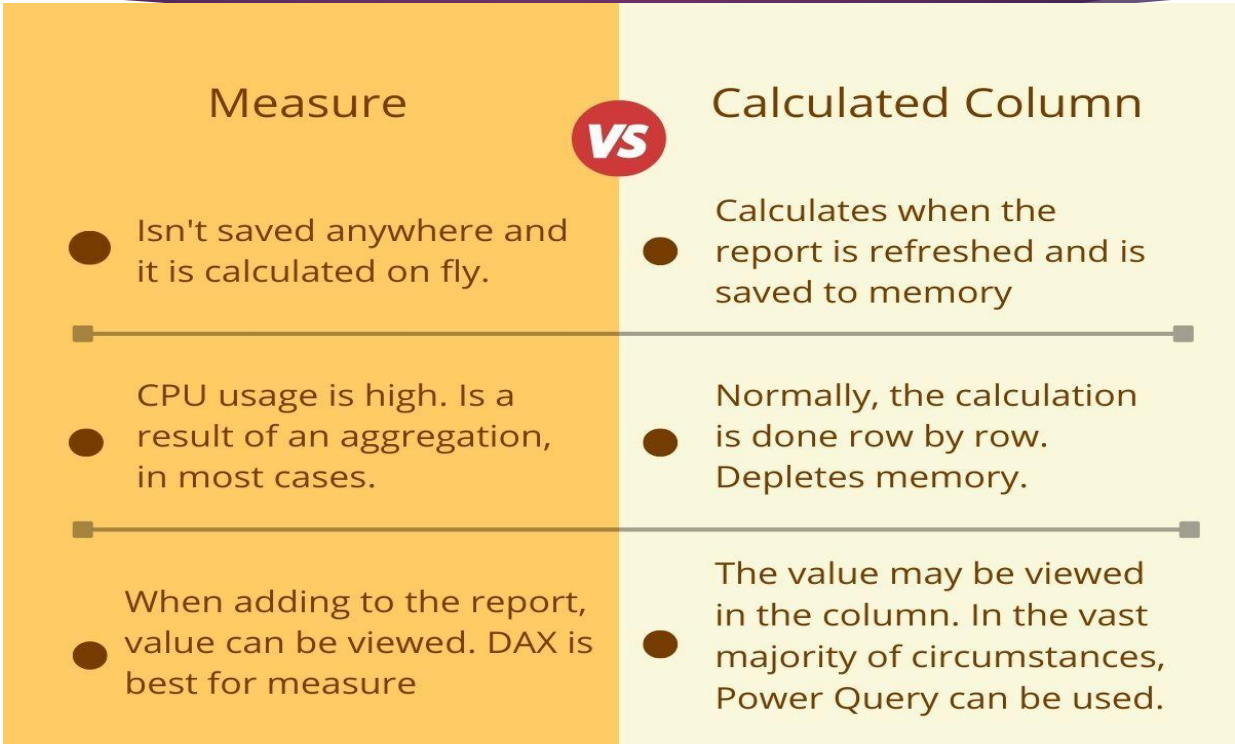


kushal.1889@gmail.com

DAX
(Data Analysis Expressions)

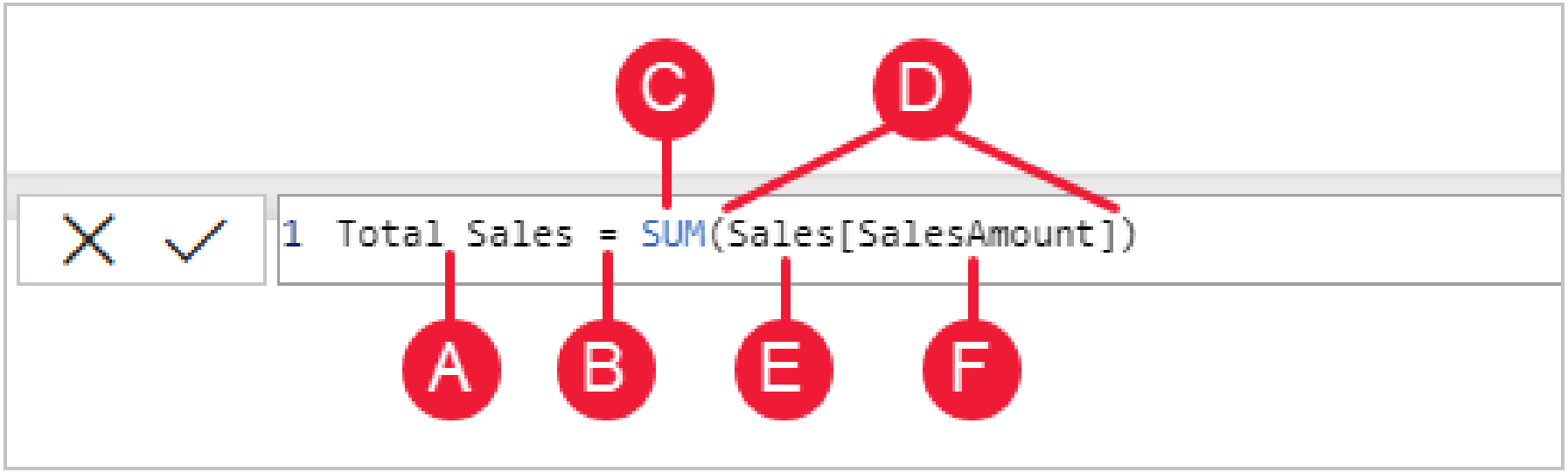
kushal.1889@gmail.com

Measure vs Calculated Column



kushal.1889@gmail.com

Syntax of DAX Function



kushal.1889@gmail.com

SOME IMPORTANT SYNTAXEX

1. SUM: SUM(table[column])

2. AVERAGE: AVERAGE(table[column])

3. COUNT: COUNT(table[column])

4. MAX: MAX(table[column])

5. MIN: MIN(table[column])

kushal.1889@gmail.com

SOME IMPORTANT SYNTAXEX

6. IF: IF(logical_test, value_if_true, value_if_false)

7.SWITCH: SWITCH(expression, value1, result1, value2, result2, . .. [default_result])

8.CALCULATE: CALCULATE(expression, filter1, filter2, ...)

9.FILTER: FILTER(table, condition1, condition2, ...)

10.ALL: ALL(table)

kushal.1889@gmail.com

SOME IMPORTANT SYNTAXEX

11.RELATED: RELATED(related_table[column])

12.RELATEDTABLE: RELATEDTABLE(related_table)

13.COUNTROWS: COUNTROWS(table)

14.EARLIER: EARLIER(expression)

15.RANKX: RANKX(table, expression, [value], [order], [\ties])

kushal.1889@gmail.com