# PROJECT TWO

Write a short note on 32 statistical analysis chart, their functions and where there can be used.

*Project 2 file, submited by Akoji Daniel.*

# ANSWER

Here are the most common statistical analysis chart.

## 1. Pie Chart

- **What it is: A circular chart divided into slices representing proportions of a whole.

- **Function: Illustrates the relative percentage of different categories within a dataset.

- **Where used: Market share analysis, budget allocations, survey responses.

## 2. Bar Chart

- **What it is: A chart with rectangular bars representing data values, with the height or length of the bar corresponding to the data value.

- **Function: Used to compare different categories or groups of data.

- **Where used: Sales data, population comparisons, product performance.

## 3. Line Chart

- **What it is: A graph that displays information using a continuous line connecting data points.

- **Function: Tracks changes or trends over time.

- **Where used: Stock prices, website traffic trends, weather patterns.

## 4. Scatter Plot

- **What it is:A graph that uses dots to represent the values of two different variables.

- **Function: Shows relationships or correlations between two variables.

- **Where used: Correlation studies (e.g., height vs. weight), regression analysis.

## 5. Histogram

- **What it is: A graphical representation of the distribution of numerical data using bars to show the frequency of data intervals (bins).

- **Function: Displays the frequency distribution of a dataset.

- **Where used: Exam score distributions, population age groups, income distributions.

## 6. Gantt Chart

- **What it is: A type of bar chart that illustrates a project schedule.

- **Function: Visualizes project tasks over time, tracking progress and dependencies.

- **Where used: Project management, task scheduling, timelines for projects.

## 7. Pareto Chart

- What it is: A bar chart with bars in descending order of frequency combined with a line chart representing the cumulative total.

- **Function: Highlights the most important factors in a dataset, following the 80/20 rule.

- **Where used: Quality control, identifying root causes of problems, process improvement.

## 8. Flow Chart

- **What it is: A diagram that shows steps in a process using symbols and arrows.

- **Function:  Maps out sequences of actions or decision points in a process.

- **Where used: Business process modeling, software design, decision-making processes.

## 9. Bubble Chart

- **What it is: A scatter plot with a third dimension represented by the size of the bubbles.

- **Function: Visualizes the relationships between three variables.

- **Where used: Financial data analysis (e.g., profit, market share, and sales), project evaluations.

## 10. Heat Map

- **What it is: A data visualization tool that uses color to represent values in a matrix or grid.

- **Function: Shows data patterns and intensity levels.

- **Where used: Website click tracking, performance analysis, geographical data mapping.

## 11. Waterfall Chart

- **What it is**: A chart that shows the cumulative effect of sequentially introduced positive or negative values.

- **Function**: Breaks down an initial value into increments showing how an outcome is reached.

- **Where used**: Financial analysis (e.g., income statements), cash flow analysis, sales analysis.

## 12. Control Chart

- **What it is**: A graph used to study how a process changes over time, showing upper and lower control limits.

- **Function**: Monitors process stability and identifies variations.

- **Where used**: Quality control, manufacturing, monitoring defect rates.

## 13. Radar Chart  (Spider Chart)

- **What it is: A chart with axes that radiate from a central point, displaying multivariate data in a circular format.

- **Function: Compares multiple variables and shows performance across different categories.

- **Where used**: Skill comparison, product performance analysis, sports analytics.

## 14. Funnel Chart

- What it is: A chart that represents the progressive reduction of data as it moves through stages.

- Function: Visualizes how data narrows down through sequential stages.

- Where used: Sales pipelines, lead conversion processes, customer acquisition funnels.

## 15. Box Plot

- **What it is: A graph that displays the distribution of data based on a five-number summary (minimum, first quartile, median, third quartile, maximum).

- **Function: Highlights the spread, central tendency, and outliers in a dataset.

- **Where use: Statistical analysis, comparing distributions, identifying outliers in datasets.

## 16. Area Chart

- **What it is: A line chart where the area under the line is filled in with color.

- **Function: Visualizes cumulative quantities over time.

- **Where used: Showing trends in data such as sales over time or population growth.

## 17. Stacked Bar Chart

- **What it is: A bar chart where each bar is divided into sub-bars, each representing a part of the total.

- **Function: Displays part-to-whole relationships in data.

- **Where used: Product sales by region, budget allocation by department.

## 18. Stacked Area Chart

- **What it is: An area chart where different data series are stacked on top of each other.

- **Function: Shows the cumulative contribution of different components over time.

- **Where used: Visualizing the total change in sales contributions from different products.

## 19. Tree Map

- **What it is: A diagram that represents hierarchical data as nested rectangles, with size proportional to value.

- **Function: Visualizes large amounts of hierarchical data.

- **Where used: Financial portfolio breakdowns, website traffic sources, project analysis.

## 20. Mosaic Plot

- **What it is: A chart that displays the proportions of categorical data using tiles with sizes proportional to frequency.

- **Function: Visualizes relationships between two or more categorical variables.

- **Where used: Demographic studies, survey data analysis, contingency tables.

## 21. Bullet Chart

- **What it is: A bar chart with a reference line, used to compare performance against a goal.

- **Function: Tracks progress towards a target.

- **Where used: Performance evaluation, financial goal tracking, KPIs.

## 22. Candlestick Chart

- **What it is: A financial chart showing the opening, closing, high, and low prices of an asset.

- **Function: Tracks asset price fluctuations over time.

- **Where used: Stock market analysis, commodity trading, forex.

## 23. Violin Plot

- **What it is: A combination of a box plot and a density plot, showing the distribution of data.

- **Function: Visualizes the distribution and frequency of data.

- **Where used: Data science, statistical analysis, comparing distributions.

## 24. Sunburst Chart

_** What it is: A circular chart that displays hierarchical data using concentric rings.

_**Function: Visualizes hierarchical structures and part-to-whole relationships.

_**Where used: Organizational structures, breakdown of large datasets, file directory structures.

## 25. Sankey Diagram

_**What it is: A flow diagram that shows the movement of quantities between different categories using arrows or lines.

_**Function: Visualizes flow and distribution of resources or data.

_**Where used: Energy usage, financial flow, material flows.

## 26. Cohort Analysis Chart

_**What it is: A chart used to study the behavior of a group of people over time.

_**Function: Analyzes retention, conversion, and behavior over time.

_**Where used: User retention analysis, marketing, subscription-based businesses.

## 27. Venn Diagram

_**What it is: A diagram with overlapping circles showing logical relationships between different datasets.

_**Function: Illustrates the commonalities and differences between datasets.

-**Where used: Set theory, logic, market segmentation.

## 28. Population Pyramid

_**What it is: A bar chart that shows the distribution of a population by age and gender.

_**Function: Visualizes demographic distribution.

_**Where used: Demographic studies, policy planning, social research.

## 29. Dot Plot

_**What it is: A chart that uses dots to display individual data points along a continuous axis.

_**Function: Shows individual data values.

_**Where used: Survey results, test scores, comparing data distributions.

## 30. Bubble Map

_**What it is: A map that uses bubbles of different sizes to represent data values over geographic locations.

_**Function: Visualizes geographical data with size as an additional variable.

_**Where used: Population density, regional sales, geographical data comparisons.

## 31.Chord Diagram:

_** What it is: Circular visualization of relationships between categories.

_**Function: Shows connections between datasets.

_**Where Used: Trade analysis, social network analysis.

## 32. Box-and-Whisker Plot

_** What it is: Summarizes distribution using quartiles.

_**Function: Displays data distribution and outliers.

_** Where Used; Exam scores, salary ranges.