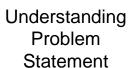
DESCRIPTIVE ANALYTICS, INFERENTIAL ANALYTICS AND DATA VISUALIZATION USING PYTHON

PRESENTED BY - REMYA R S



Analyzing Data for a Business







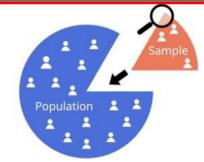
Data Collection



Data Cleaning



Descriptive Analysis



Inferential Analysis



Data Visualization



Predictive Analysis



Descriptive Analysis

10,20,20,30,40,50,50,50,60

Count =9

Mean (Average):

Mean= (10+20+20+30+40+50+50+50+60) / 9= 36.67

Median, middle value of the sorted list = 40

Mode, value that appears most frequently =50

Maximum=60

Minimum=10

Descriptive Analysis

10,20,20,30,40,50,50,50,60

Standard Deviation =
$$\sqrt{\frac{\sum (x_i - \mu)^2}{N}}$$

$$\mu = \frac{10 + 20 + 20 + 30 + 40 + 50 + 50 + 50 + 60}{9} = \frac{330}{9} \approx 36.67$$

$$N = 9$$

$$\sum (x_i - \mu)^2 = (10 - 36.67)^2 + (20 - 36.67)^2 + (20 - 36.67)^2 + (30 - 36.67)^2 + (40 -$$

$$=(-26.67)^2+(-16.67)^2+(-16.67)^2+(-6.67)^2+(3.33)^2+(13.33)^2+(13.33)^2$$



Standard deviation = 16.10

$$=711.11 + 277.78 + 277.78 + 44.45 + 11.09 + 177.69 + 177.69 + 177.69 + 544.45$$

Descriptive Analysis

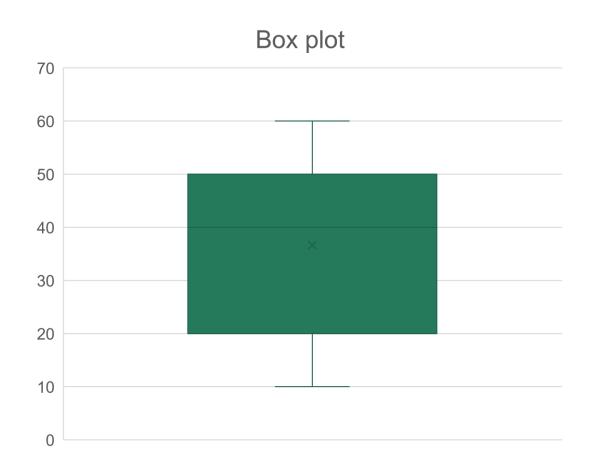
10,20,20,30,40,50,50,50,60

A box plot is a standardized way of displaying the distribution of data

Q2 -> rep. middle value and 50 % of data lies below it

 $Q1 \rightarrow 25 \%$ of data lies below it

 $Q3 \rightarrow 75 \%$ of data lies below it



Importance of Inferential Analysis

Employee Name	Employee UID	Designation	Basic	Allowances	Deductions	Net Salary
Astha Puri	AS2101	Developer	₹15,000	₹3,000	₹1,000	₹17,000
Bijal Pande	AS2102	Graphic Design	₹10,000	₹1,200	₹-	₹11,200
Chirag Sharma	AS2103	Sr. Developer	₹25,000	₹4,000	₹1,500	₹27,500
Divya Soni	AS2104	Graphic Design	₹12,000	₹2,000	₹1,000	₹13,000
Erum Rastogi	AS2105	Office Admin	₹14,500	₹2,000	₹800	₹15,700
Farhan Patel	AS2106	Developer	₹16,000	₹3,000	₹1,000	₹18,000
Geet Sahu	AS2107	Sr. Accourtant	₹35,000	₹8,000	₹3,500	₹39,500
Hari Mehta	AS2108	Project Manager	₹40,000	₹5,000	₹2,000	₹43,000
Isha Sharma	AS2109	HR Manager	₹30,000	₹3,500	₹1,500	₹32,000
Jatin Kumar	AS2110	IT Support	₹18,000	₹2,500	₹1,000	₹19,500
Kavita Reddy	AS2111	Data Analyst	₹22,000	₹3,000	₹1,200	₹23,800
Lakshmi Singh	AS2112	Developer	₹20,000	₹2,500	₹1,000	₹21,500
	Astha Puri Bijal Pande Chirag Sharma Divya Soni Erum Rastogi Farhan Patel Geet Sahu Hari Mehta Isha Sharma Jatin Kumar Kavita Reddy	Astha Puri Bijal Pande AS2102 Chirag Sharma AS2103 Divya Soni AS2104 Erum Rastogi AS2105 Farhan Patel AS2106 Geet Sahu AS2107 Hari Mehta AS2108 Isha Sharma AS2109 Jatin Kumar AS2110 Kavita Reddy AS2111	Astha Puri AS2101 Developer Bijal Pande AS2102 Graphic Design Chirag Sharma AS2103 Sr. Developer Divya Soni AS2104 Graphic Design Erum Rastogi AS2105 Office Admin Farhan Patel AS2106 Developer Geet Sahu AS2107 Sr. Accountant Hari Mehta AS2108 Project Manager Isha Sharma AS2109 HR Manager Jatin Kumar AS2110 IT Support Kavita Reddy AS2111 Data Analyst	Astha Puri AS2101 Developer ₹15,000 Bijal Pande AS2102 Graphic Design ₹10,000 Chirag Sharma AS2103 Sr. Developer ₹25,000 Divya Soni AS2104 Graphic Design ₹12,000 Erum Rastogi AS2105 Office Adm in ₹14,500 Farhan Patel AS2106 Developer ₹16,000 Geet Sahu AS2107 Sr. Accourtant ₹35,000 Hari Mehta AS2108 Project Manager ₹40,000 Isha Sharma AS2109 HR Manager ₹30,000 Jatin Kumar AS2110 IT Support ₹18,000 Kavita Reddy AS2111 Data Analyst ₹22,000	Astha Puri AS2101 Developer ₹15,000 ₹3,000 Bijal Pande AS2102 Graphic Design ₹10,000 ₹1,200 Chirag Sharma AS2103 Sr. Developer ₹25,000 ₹4,000 Divya Soni AS2104 Graphic Design ₹12,000 ₹2,000 Erum Rastogi AS2105 Office Admin ₹14,500 ₹2,000 Farhan Patel AS2106 Developer ₹16,000 ₹3,000 Geet Sahu AS2107 Sr. Accourtant ₹35,000 ₹8,000 Hari Mehta AS2108 Project Manager ₹40,000 ₹5,000 Isha Sharma AS2109 HR Manager ₹30,000 ₹3,500 Jatin Kumar AS2110 IT Support ₹18,000 ₹2,500 Kavita Reddy AS2111 Data Analyst ₹22,000 ₹3,000	Astha Puri AS2101 Developer ₹15,000 ₹3,000 ₹1,000 Bijal Pande AS2102 Graphic Design ₹10,000 ₹1,200 ₹- Chirag Sharma AS2103 Sr. Developer ₹25,000 ₹4,000 ₹1,500 Divya Soni AS2104 Graphic Design ₹12,000 ₹2,000 ₹1,000 E um Rastogi AS2105 Office Adm in ₹14,500 ₹2,000 ₹800 Farhan Patel AS2106 Developer ₹16,000 ₹3,000 ₹1,000 Geet Sahu AS2107 Sr. Accountant ₹35,000 ₹3,500 ₹3,500 Hari Mehta AS2108 Project Manager ₹40,000 ₹5,000 ₹2,000 Isha Sharma AS2109 HR Manager ₹30,000 ₹3,500 ₹1,500 Jatin Kumar AS2110 IT Support ₹18,000 ₹2,500 ₹1,000 Kavita Reddy AS2111 Data Analyst ₹22,000 ₹3,000 ₹1,200



Some Tests Inferential Analysis

Test	To check relation between			
Pearson Correlation	Two numerical columns			
Chi Square Test	Two categorical columns			
T Test	A numerical column and a categorical column with two categories.			
ANOVA	A numerical column and a categorical column multiple categories.			

When p<0.05, there is a statistically significant association between features / columns

Visualization



Chart: graphical representation of data or information

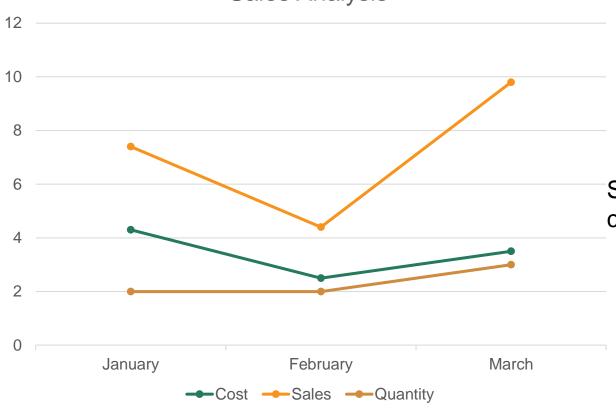
Its designed to visually communicate patterns, trends, and relationships that might be less clear from raw data alone.

Charts provide a visual summary of data, making it easier to grasp patterns and trends at a glance.

Different types of charts (such as bar charts, line graphs, pie charts, etc.) allow for different types of analysis.

Line Chart

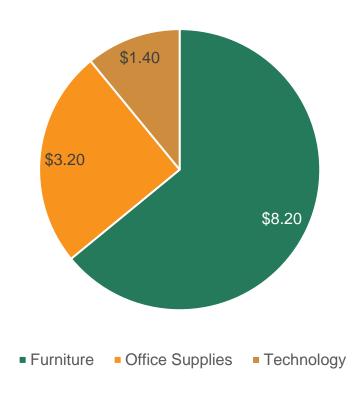




Shows trends over time or progression of data points in chronological order.

Pie Chart

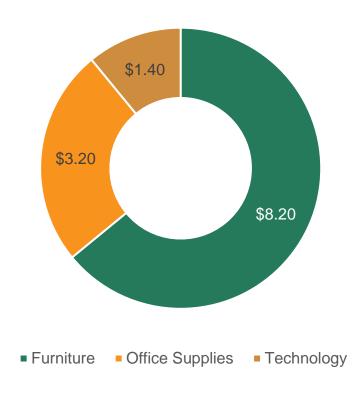




Displays proportions or percentages of a whole.

Donut Chart





Displays proportions or percentages of a whole.

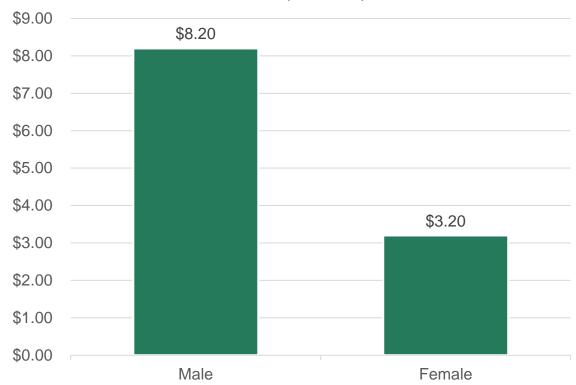
Tree map



Used to visualize data with multiple levels of categories,

Column Chart





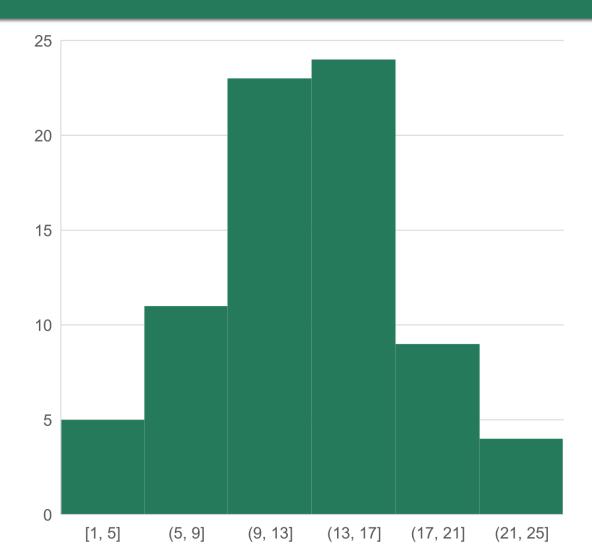
Used to compare quantities of different categories or groups.

Bar Chart



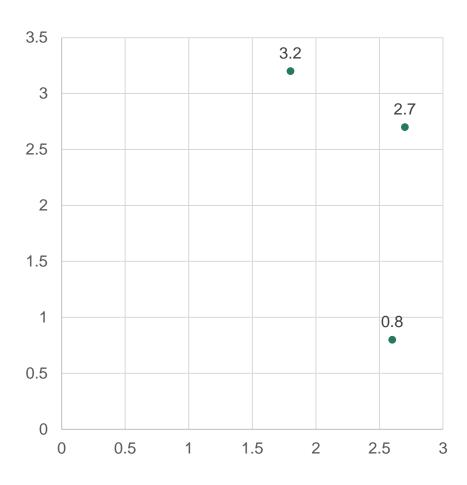
Used to compare quantities of different categories or groups.

Histogram



Illustrates the distribution of data points across a continuous interval or range.

Line Chart



Shows relationships or correlations between two variables.

Mank Mou