Manual for AEC.

/*(Don't print this Note:Students prepare your journal with these experiments. use your own data for presentation and attach output.

Add your index page along with certificate page. Journal is evaluated for 5marks. Conduction is 20 marks. Open Ended Project 10 marks.)*/

Experiment 1: How to Create a Speedometer in Excel

Objective:

Create a speedometer chart to visualize data effectively.

Steps:

1. **Open Excel** and input sample data:
2. Insert the **pointer value** in a separate cell, (adjustable).
3. Highlight data in columns to be selected and go to the **Insert** tab, and select **Doughnut Chart**.
4. Customize the chart:
    - Format each slice with distinct colors (e.g., red, yellow, green for low to high).
    - Remove the chart title and legend if unnecessary.
5. Add the pointer:
    - Insert a **scatter plot** with a single data point (the pointer value).
    - Adjust the angle of the doughnut chart so the pointer aligns correctly.
6. Final touches:
    - Group elements to create a cohesive speedometer.

Output:

A visually appealing chart with a pointer indicating the value within a range of low, medium, and high.

/*(Attach Print)*/

Experiment 2: How to Create Pivot Tables

Objective:

Summarize and analyse data using a Pivot Table.

Steps:

1. **Prepare your dataset:**
    - Open an Excel sheet and organize data into columns (e.g., Date, Product, Sales).
2. **Insert a Pivot Table:**
    - Select your dataset, go to the **Insert** tab, and click **PivotTable**.
    - Choose to place the Pivot Table in a new worksheet or the existing one.
3. **Build the table:**
    - Drag fields to the appropriate sections:
        - **Rows:** E.g., Product or Category.
        - **Columns:** E.g., Region.
        - **Values:** E.g., Sum of Sales.
        - **Filters (optional):** E.g., Date or Year.
4. **Format and analyze:**
    - Use **Value Field Settings** to change summaries (e.g., Sum, Average).
    - Add slicers for easy filtering if needed.

Output:

A dynamic table summarizing data by categories or metrics (e.g., total sales per product).

//(Attach print)

Experiment 3: How to Add Datasets in Power BI

Objective:

Import datasets into Power BI for visualization and analysis.

Steps:

1. **Open Power BI Desktop.**
2. **Load data:**
    - Click **Home > Get Data** and choose a data source:
        - Excel, CSV, SQL Server, or other formats.
    - Browse and select your dataset, then click **Load**.
3. **Transform data (if needed):**
    - Use **Power Query Editor** to clean or filter the data before loading.
4. **Confirm dataset:**
    - After loading, the dataset will appear in the **Fields Pane** on the right.
5. **Save your Power BI file:**
    - Save the project for future use.

Output:

A ready-to-use dataset within Power BI, displayed in the Fields Pane, for creating visuals or reports.

//(Attach print)

Experiment 4: Basics of Tableau

Objective:
To understand and implement the fundamentals of Tableau for creating simple visualizations and performing data analysis.

Steps:

1. Install and Set Up Tableau

- **Download:** Visit the Tableau Public or Tableau Desktop website. Install the free version (Tableau Public) for practice.
- **Create an Account:** Sign up for a Tableau Public account to save and share your visualizations.

2. Understand the Interface

- **Connect Pane:** For importing data sources (e.g., Excel, CSV, or databases).
- **Sheets and Dashboard Tabs:** For creating visualizations and combining them into dashboards.
- **Data Pane:** Displays imported data fields (dimensions and measures).
    - **Dimensions:** Categorical data (e.g., Region, Category).
    - **Measures:** Numerical data (e.g., Sales, Profit).
- **Show Me Pane:** Offers a variety of visualization types like bar charts, pie charts, maps, etc.

3. Import Data

- **Supported Formats:** Excel, CSV, JSON, SQL, or even live database connections.
- Drag and drop your file into the Connect Pane. Tableau will display a preview of the dataset.

4. Build Visualizations (Sheets)

- **Drag Fields to Rows and Columns, Use Filters, Sort and Group**

5. Explore Visualization Types

- **Bar Chart, Line Chart**, **Pie Chart, Maps**. **Scatter Plot**

6. Use Calculations and Aggregations

7. Add Filters and Parameters

8. Combine Sheets into Dashboards

- **Create Dashboards, Arrange Elements, Add Interactivity**

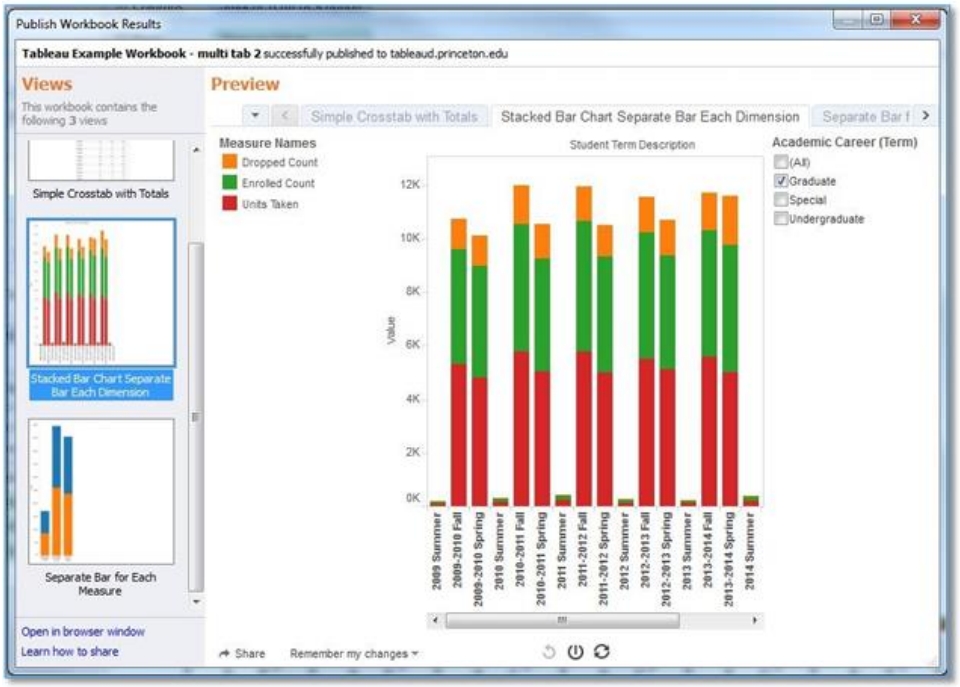
9. Format and Customize

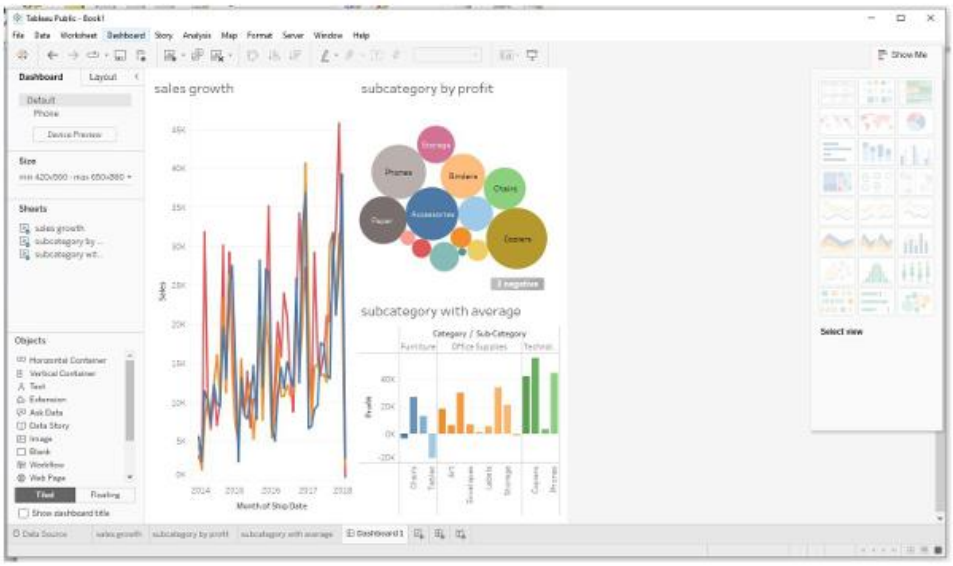
10. Save and Share

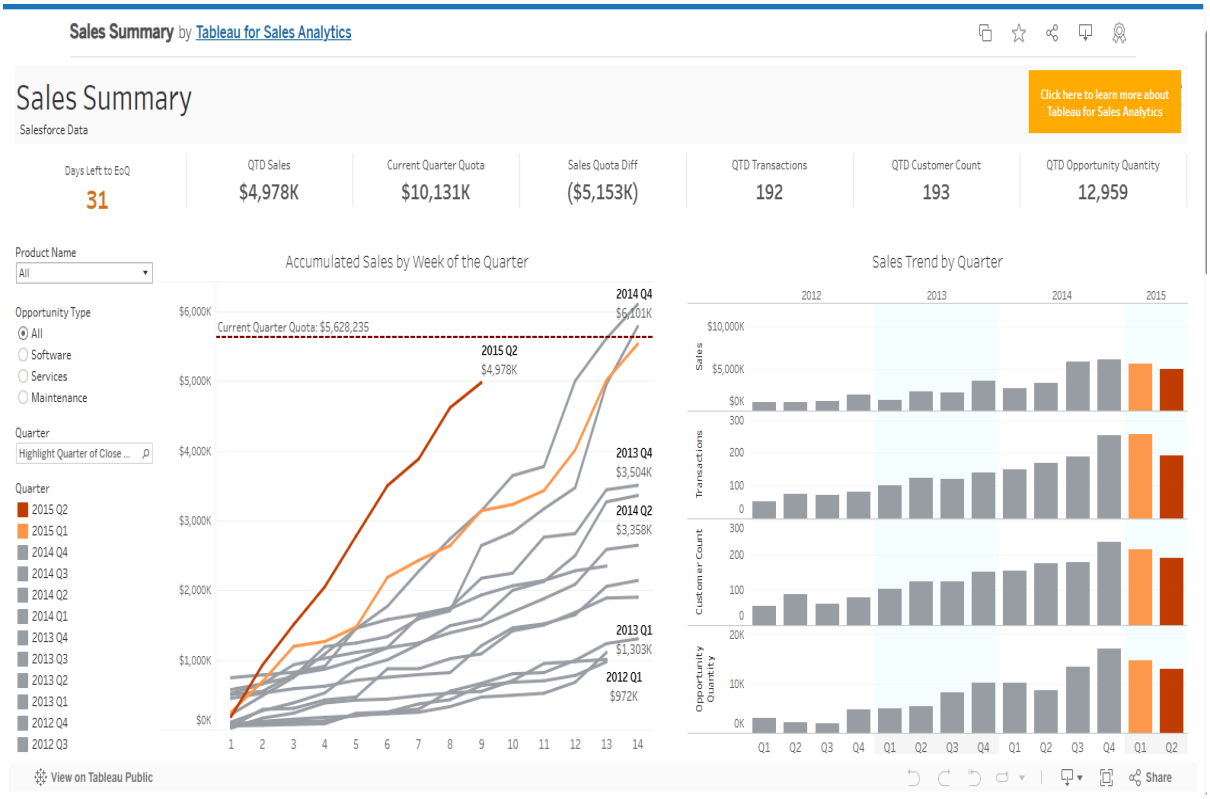
- **Save Locally:** Save Tableau files as `.twbx` (Packaged Workbook).
- **Share Online:** Publish visualizations to Tableau Public or export as an image/PDF.

Output:

Sample screen shots showing various operations in tableau.



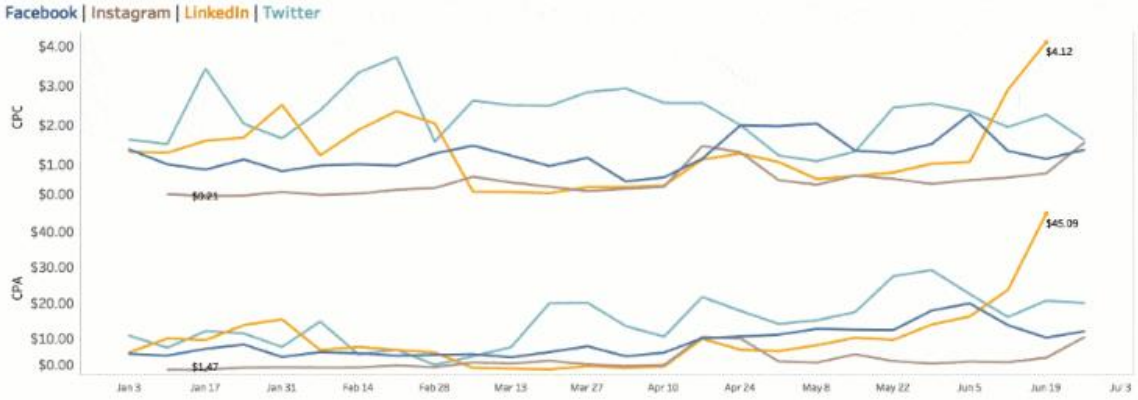




Paid Social Performance Dashboard

Digital Media Performance

Platform	Spend	Impressions	Clicks	CPA	CPC	CTR
Facebook	$52,032	6,076K	41,610	$8.56	$1.25	0.68%
Instagram	$18,533	5,852K	39,181	$3.17	$0.47	0.67%
LinkedIn	$38,841	7,340K	50,253	$5.29	$0.77	0.68%
Twitter	$382,678	32,555K	172,254	$11.75	$2.22	0.53%



Social Media Performance

Platform	Comments	Likes	Shares	Engagements
Facebook	132	2,157	431	2,404
Instagram	182	2,824	1,299	5,408
LinkedIn	107	2,053	1,117	4,412
Twitter	610	10,473	1,792	13,422

Experiment 5: Basics of WEKA

Objective:
To understand and implement the fundamentals of the WEKA tool for data pre-processing and applying basic machine learning algorithms to classify and analyse data.

1. Install WEKA

- **Download:** Visit the WEKA official website and install the latest version.

Interface: Open WEKA, where you'll find tabs like *Preprocess, Classify, Cluster, Associate, and Visualize*.

2. Load a Dataset

- **Supported Formats:** Load datasets in `.arff` (WEKA's native format) or `.csv`.
- Use the *Preprocess* tab to import and explore data.

3. Explore Preprocessing

- **Filters:** Handle missing values, normalize data, or discretize attributes.
  - Example: Use *ReplaceMissingValues* filter to fill missing data.
- **Attribute Selection:** Remove irrelevant or redundant attributes.

4. Apply Machine Learning Algorithms

- Go to the *Classify* tab for supervised learning.
  - **Choose Algorithm:** Example: Use J48 (Decision Tree) or Naive Bayes.
  - **Evaluation:** Split data using options like *Percentage Split* (e.g., 70% training, 30% testing).

5. Analyze Results

- **Confusion Matrix:** Shows correct vs. incorrect predictions.
- **Performance Metrics:** Accuracy, precision, recall, and F1-score.
- **Graph Output:** Visualize results, e.g., Decision Trees or ROC curves.

6. Experiment with Clustering

- Use the *Cluster* tab for unsupervised learning.
  - Example: Apply K-means clustering to group similar data points.

7. Visualize Data

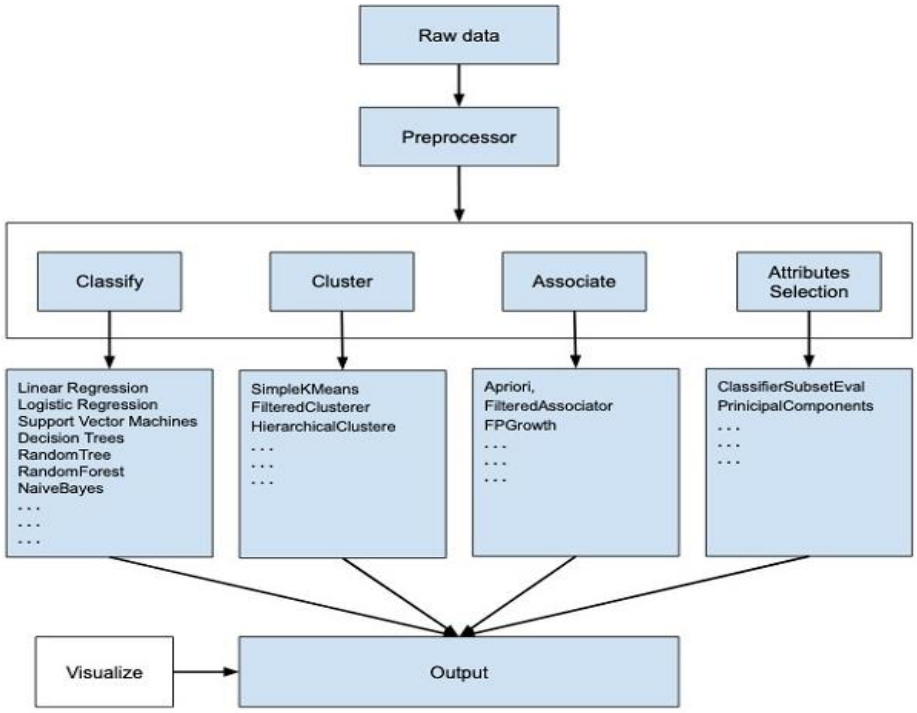
- Open the *Visualize* tab to explore attribute relationships using scatter plots or histograms.

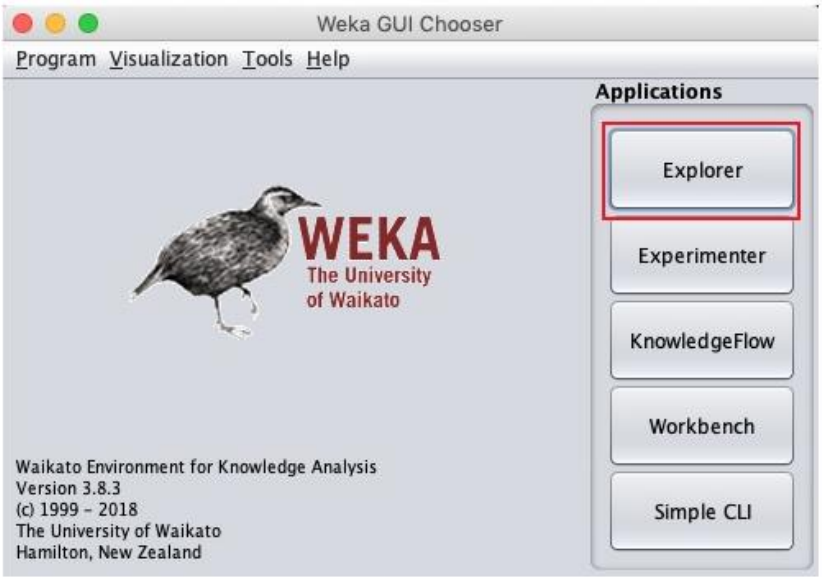
8. Save and Export Results

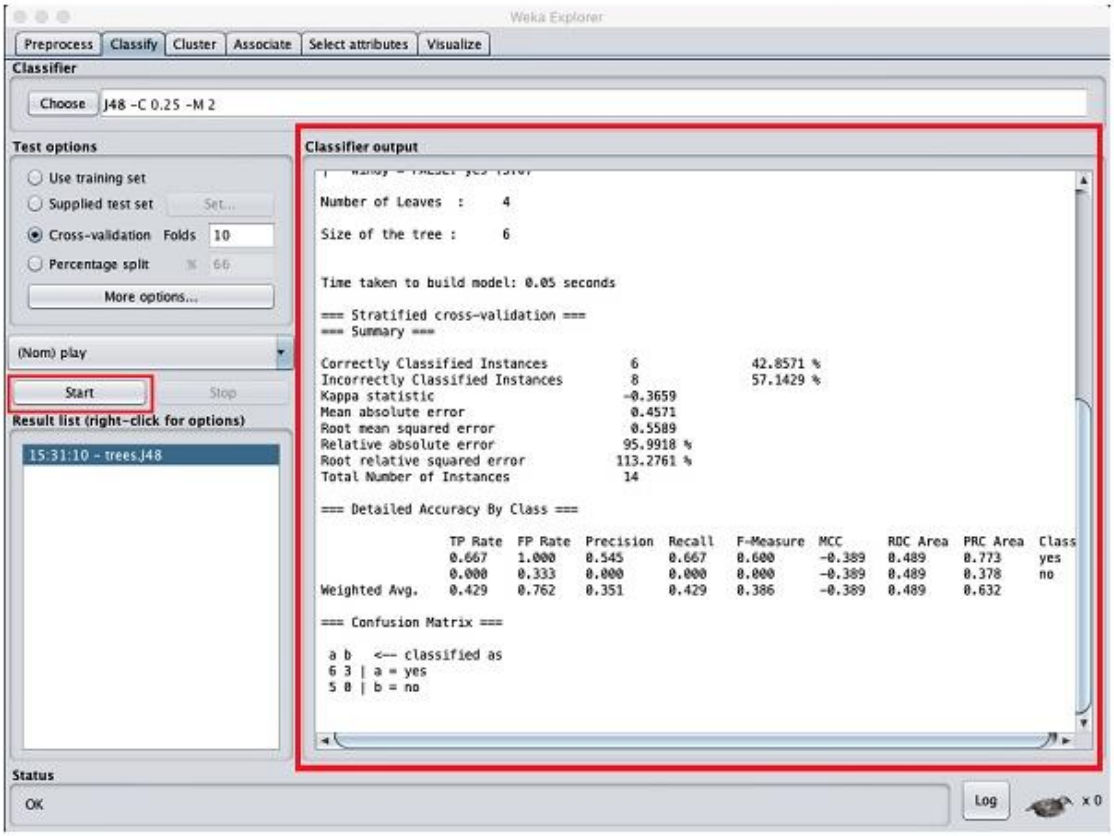
- Save your processed dataset or model as `.model` or `.arff` for reuse.
- Export visualizations as images for reporting.
-

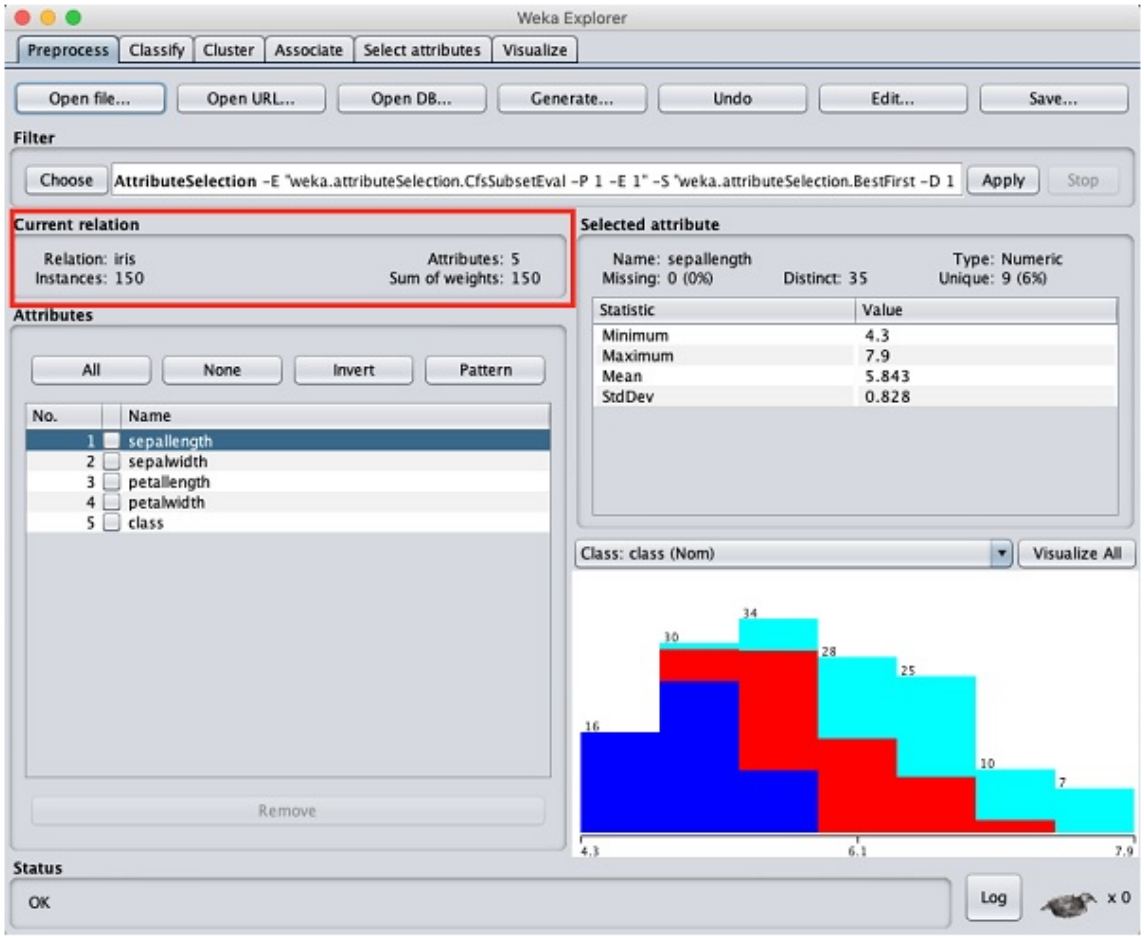
Output:

- Sample screen shots showing various visualization operations in WEKA






Weka Explorer
Preprocess
Classify
Cluster
Associate
Select attributes
Visualize
Classifier
Choose
J48 -C 0.25 -M 2
Test options
Use training set
Supplied test set
Set...
Cross-validation
Folds
10
Percentage split
%
66
More options...
(Nom) play
Start
Stop
Result list (right-click for options)
15:31:10 - trees.J48
Classifier output
Number of Leaves : 4
Size of the tree : 6
Time taken to build model: 0.05 seconds
=== Stratified cross-validation ===
=== Summary ===
Correctly Classified Instances 6 42.8571 %
Incorrectly Classified Instances 8 57.1429 %
Kappa statistic -0.3659
Mean absolute error 0.4571
Root mean squared error 0.5589
Relative absolute error 95.9918 %
Root relative squared error 113.2761 %
Total Number of Instances 14
=== Detailed Accuracy By Class ===
TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class
0.667 1.000 0.545 0.667 0.600 -0.389 0.489 0.773 yes
0.000 0.333 0.000 0.000 0.000 -0.389 0.489 0.378 no
Weighted Avg. 0.429 0.762 0.351 0.429 0.386 -0.389 0.489 0.632
=== Confusion Matrix ===
a b <-- classified as
6 3 | a = yes
5 0 | b = no
Status
OK
Log
x 0


Weka Explorer
Preprocess
Classify
Cluster
Associate
Select attributes
Visualize
Open file...
Open URL...
Open DB...
Generate...
Undo
Edit...
Save...
Filter
Choose
AttributeSelection -E "weka.attributeSelection.CfsSubsetEval -P 1 -E 1" -S "weka.attributeSelection.BestFirst -D 1
Apply
Stop
Current relation
Relation: iris
Instances: 150
Attributes: 5
Sum of weights: 150
Selected attribute
Name: sepallength
Missing: 0 (0%)
Distinct: 35
Type: Numeric
Unique: 9 (6%)
Statistic
Value
Minimum 4.3
Maximum 7.9
Mean 5.843
StdDev 0.828
Attributes
All
None
Invert
Pattern
No.
Name
1 sepallength
2 sepalwidth
3 petallength
4 petalwidth
5 class
Remove
Class: class (Nom)
Visualize All
34
30
28
25
16
10
7
4.3
6.1
7.9
Status
OK
Log
x 0

OPEN ENDED PROJECT

(to be added here)

Rubrics to be added after each experiment Here’s the complete rubric table for all five experiments, each evaluated for 5 marks:Add them one after the other sequencially

Experiment 1:

Criteria	Description	Marks	Evaluation Levels
Experiment 1: Speedometer in Excel	Accuracy and design of the speedometer chart, including pointer placement and segmentation clarity	5	- **Excellent (5):** Accurate chart with a functional pointer and clear segments. - **Good (3-4):** Minor errors in design or alignment. - **Basic (1-2):** Incomplete chart or significant errors.
Conduction	Demonstration of practical skills and adherence to correct procedural steps	15	- **Excellent (13-15):** All steps executed flawlessly with a clear understanding of the process. - **Good (9-12):** Most steps performed correctly with minor errors. - **Basic (1-8):** Significant errors or incomplete execution.
Viva	Clarity and depth of understanding, ability to answer questions confidently	5	- **Excellent (5):** Clear, confident answers with good understanding of concepts. - **Good (3-4):** Moderate understanding with.

Experiment 2 :

Criteria	Description	Marks	Evaluation Levels
Experiment 2: Pivot Tables	Ability to create and format a pivot table, summarize data, and present key insights	5	- **Excellent (5):** Accurate table with meaningful summaries and correct formatting. - **Good (3-4):** Minor issues in field placement or summarization. - **Basic (1-2):** Incomplete or incorrect pivot table.
Conduction	Demonstration of practical skills and adherence to correct procedural steps	15	- **Excellent (13-15):** All steps executed flawlessly with a clear understanding of the process. - **Good (9-12):** Most steps performed correctly with minor errors. - **Basic (1-8):** Significant errors or incomplete execution.
Viva	Clarity and depth of understanding, ability to answer questions confidently	5	- **Excellent (5):** Clear, confident answers with good understanding of concepts. - **Good (3-4):** Moderate understanding with.
Experiment 2: Pivot Tables	Ability to create and format a pivot table, summarize data, and present key insights	5	- Excellent (5): Accurate table with meaningful summaries and correct formatting. - Good (3-4): Minor issues in field placement or summarization. - Basic (1-2): Incomplete or incorrect pivot table.

Experiment 3:

Criteria	Description	Marks	Evaluation Levels
Experiment 3: Adding Datasets in Power BI	Successful dataset import, data integrity, and readiness for visualization	5	- Excellent (5): Dataset successfully imported, clean, and ready for use. - Good (3-4): Minor errors or adjustments needed for usability. - Basic (1-2): Incomplete or erroneous data import.
Conduction	Demonstration of practical skills and adherence to correct procedural steps	15	- **Excellent (13-15):** All steps executed flawlessly with a clear understanding of the process. - **Good (9-12):** Most steps performed correctly with minor errors. - **Basic (1-8):** Significant errors or incomplete execution.
Viva	Clarity and depth of understanding, ability to answer questions confidently	5	- **Excellent (5):** Clear, confident answers with good understanding of concepts. - **Good (3-4):** Moderate understanding with.

Experiment 4:

Criteria	Description	Marks	Evaluation Levels
Experiment 4: Tableau Basics	Successfully importing datasets and preparing data (handling missing values, renaming fields, etc.).Understanding different visualization representations.	5	Excellent (5): Fully functional and meaningful filters/dashboards. - Good (3-4): Some interactivity issues or less meaningful filters. - Basic (1-2): Limited or no interactivity added
Conduction	Demonstration of practical skills and adherence to correct procedural steps	15	- **Excellent (13-15):** All steps executed flawlessly with a clear understanding of the process. - **Good (9-12):** Most steps performed correctly with minor errors. - **Basic (1-8):** Significant errors or incomplete execution.
Viva	Clarity and depth of understanding, ability to answer questions confidently	5	- **Excellent (5):** Clear, confident answers with good understanding of concepts. - **Good (3-4):** Moderate understanding with.

Experiment 5:

Criteria	Description	Marks	Evaluation Levels
Experiment 5: WEKA Basics	Successfully importing datasets and preparing data along with clustering, classification etc.	5	Excellent (5): Well-structured, readable, and interactive dashboard. - Good (3-4): Minor layout or readability issues. - Basic (1-2): Poorly structured or incomplete dashboard
Conduction	Demonstration of practical skills and adherence to correct procedural steps	15	- **Excellent (13-15):** All steps executed flawlessly with a clear understanding of the process. - **Good (9-12):** Most steps performed correctly with minor errors. - **Basic (1-8):** Significant errors or incomplete execution.
Viva	Clarity and depth of understanding, ability to answer questions confidently	5	- **Excellent (5):** Clear, confident answers with good understanding of concepts. - **Good (3-4):** Moderate understanding with.

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S.No	Title	Date	Description	Marks		
				Conduction &Viva(20M)	Journal (5M)	Total
1	**Experiment 1: Speedometer in Excel**	6/9/24, 20/9/24	Accuracy and design of the speedometer chart, including pointer placement and segmentation clarity			
2	**Experiment 2: Pivot Tables**	27/9/24, 11/10/24	Ability to create and format a pivot table, summarize data, and present key insights			
3	**Experiment 3: Adding Datasets in Power BI**	18/10/24, 25/10/24	Successful dataset import, data integrity, and readiness for visualization			
4	**Experiment 4: Tableau Basics**	1/11/24, 8/11/24	Successfully importing datasets and preparing data (handling missing values, renaming fields, etc.).Understanding different visualization representations.			
5	**Experiment 5: WEKA Basics**	22/11/24, 11/11/24	Successfully importing datasets and preparing data along with clustering, classification etc.			
Conduction along with Oral Viva		**Continuous**	Demonstration of practical skills and adherence to correct procedural steps and ability to answer questions correctly and confidently	Total:		
				Avg:		
Open Ended Project (10M)		25/10/24	Topic(needs to be mentioned by student)			
Total Marks: 35						
Faculty: Veena V Kangralkar			**Signature:**			