Week 3: Data Visualization with Charts

Academic Dataset

Student Name	Age	Grade	Subject	Marks	Region	Exam Date
Alice Brown	20	B	Mathematics	85	North	2024-01-15
Bob Johnson	21	A	Physics	92	East	2024-02-10
Charlie Black	22	C	Chemistry	78	West	2024-03-05
Eve White	20	A	Mathematics	88	South	2024-04-20
Frank Green	21	B	Biology	83	North	2024-05-30
Grace Blue	22	A	Physics	90	East	2024-06-15
Hank Purple	20	B	Chemistry	82	West	2024-07-01
Ivy Orange	21	A	Biology	95	South	2024-07-20
Jane Smith	22	C	Mathematics	75	North	2024-08-15
John Doe	20	B	Physics	88	East	2024-09-05

Exercises for Creating Charts:

1. Column Chart: Marks Distribution by Subject

Objective: Create a column chart to display the average marks for each subject.

Steps:

1. Prepare Data:
   - Create a summary table with average marks by subject:

Subject	Average Marks
Mathematics	82.67
Physics	90
Chemistry	80
Biology	89

2. Select Data:
   - Highlight the summary table.
3. Insert Column Chart:
   - Go to the "Insert" tab.

- Click on "Insert Column or Bar Chart."
- Choose "Clustered Column."

4. Format Chart:
- Add chart title: "Average Marks by Subject."
- Add axis titles: "Subject" (horizontal axis) and "Average Marks" (vertical axis).

2. Pie Chart: Grade Distribution

Objective: Create a pie chart to display the distribution of grades.

Steps:

1. Prepare Data:
- Create a summary table with the count of each grade:

Grade	Count
A	4
B	4
C	2

2. Select Data:
- Highlight the summary table.

3. Insert Pie Chart:
- Go to the "Insert" tab.
- Click on "Insert Pie or Doughnut Chart."
- Choose "Pie."

4. Format Chart:
- Add chart title: "Grade Distribution."
- Add data labels to show percentages.

3. Line Chart: Marks Over Time

Objective: Create a line chart to display the trend of marks over exam dates.

Steps:

1. Select Data:
- Highlight the columns "Exam Date" and "Marks."

2. Insert Line Chart:
- Go to the "Insert" tab.
- Click on "Insert Line or Area Chart."

- Choose "Line."

3. Format Chart:

- Add chart title: "Marks Over Time."
- Add axis titles: "Exam Date" (horizontal axis) and "Marks" (vertical axis).

4. Pivot Chart: Marks by Subject and Region

Objective: Create an interactive chart to analyze marks by subject and region.

Steps:

1. Create a Pivot Table:

- Select the entire dataset.
- Go to the "Insert" tab.
- Click on "PivotTable."
- Choose where to place the PivotTable (e.g., a new worksheet).

2. Configure Pivot Table:

- In the PivotTable Fields pane, drag "Subject" to the Rows area. - Drag "Region" to the Columns area.
- Drag "Marks" to the Values area.

3. Create Pivot Chart:

- Click anywhere inside the PivotTable.
- Go to the "PivotTable Analyze" tab.
- Click on "PivotChart."
- Choose a chart type (e.g., "Clustered Column").

4. Format Chart:

- Add chart title: "Marks by Subject and Region."

5. Bar Chart: Count of Students by Age

Objective: Create a bar chart to display the count of students by age.

Steps:

1. Prepare Data:

- Create a summary table with the count of students by age:

Age	**Count**

20	4
21	3
22	3

2. Select Data:
   - Highlight the summary table.
3. Insert Bar Chart:
   - Go to the "Insert" tab.
   - Click on "Insert Column or Bar Chart."
   - Choose "Clustered Bar."
4. Format Chart:
   - Add chart title: "Count of Students by Age."
   - Add axis titles: "Count" (horizontal axis) and "Age" (vertical axis).

6. Scatter Plot: Marks vs. Age

Objective: Create a scatter plot to show the relationship between marks and age.

Steps:

1. Select Data:
   - Highlight the columns "Age" and "Marks."
2. Insert Scatter Plot:
   - Go to the "Insert" tab.
   - Click on "Insert Scatter (X, Y) or Bubble Chart."
   - Choose "Scatter."
3. Format Chart:
   - Add chart title: "Marks vs. Age."
   - Add axis titles: "Age" (horizontal axis) and "Marks" (vertical axis).

7. Area Chart: Cumulative Marks Over Time

Objective: Create an area chart to display cumulative marks over exam dates.

Steps:

1. Prepare Data:
   - Create a column with cumulative marks:

Exam Date	Marks	Cumulative Marks
2024-01-15	85	85
2024-02-10	92	177
2024-03-05	78	255
2024-04-20	88	343
2024-05-30	83	426
2024-06-15	90	516
2024-07-01	82	598
2024-07-20	95	693
2024-08-15	75	768
2024-09-05	88	856

2. Select Data:
   - Highlight the columns "Exam Date" and "Cumulative Marks."
3. Insert Area Chart:
   - Go to the "Insert" tab.
   - Click on "Insert Line or Area Chart."
   - Choose "Stacked Area."
4. Format Chart:
   - Add chart title: "Cumulative Marks Over Time."
   - Add axis titles: "Exam Date" (horizontal axis) and "Cumulative Marks" (vertical axis).

8. Histogram: Distribution of Marks

Objective: Create a histogram to display the distribution of marks.

Steps:

1. Select Data:
   - Highlight the column "Marks."
2. Insert Histogram:
   - Go to the "Insert" tab.
   - Click on "Insert Statistic Chart."
   - Choose "Histogram."

3. Format Chart:

- Add chart title: "Distribution of Marks."

9. Bubble Chart: Marks, Age, and Grade

Objective: Create a bubble chart to display marks and age, with bubble size representing grades.

Steps:

1. Prepare Data:

- Assign numerical values to grades:

Grade	Value
A	3
B	2
C	1

2. Select Data:

- Highlight the columns "Age," "Marks," and "Grade (Value)."

3. Insert Bubble Chart:

- Go to the "Insert" tab.
- Click on "Insert Scatter (X, Y) or Bubble Chart."
- Choose "Bubble."

4. Format Chart:

- Add chart title: "Marks, Age, and Grade."
- Add axis titles: "Age" (horizontal axis) and "Marks" (vertical axis).

10. Combo

Objective: Create a combo chart to display marks for each student in different subjects, with a line indicating the average marks.

Steps:

1. Prepare Data:

- Use the existing dataset:

Student Name	Mathematics	Physics	Chemistry	Biology
Alice Brown	85			
Bob Johnson		92		

Charlie Black			78	
Eve White	88			
Frank Green				83
Grace Blue		90		
Hank Purple			82	
Ivy Orange				95
Jane Smith	75			
John Doe		88		

- Add a row for average marks:

Student Name	**Mathematics**	**Physics**	**Chemistry**	**Biology**
Average	82.67	90	80	89

2. Select Data:
   - Highlight the entire table including the average row.
3. Insert Combo Chart:
   - Go to the "Insert" tab on the Ribbon.
   - Click on "Insert Combo Chart."
   - Choose "Clustered Column - Line."
4. Customize Chart Types for Series:
   - Right-click the chart and select "Change Chart Type."
   - For each data series (Mathematics, Physics, Chemistry, Biology), ensure they are set to "Clustered Column."
   - Set the "Average" series to "Line."
5. Format Chart:
   - Add chart title: "Marks by Subject with Average Line."
   - Add axis titles: "Subjects" (horizontal axis) and "Marks" (vertical axis).
   - Ensure the "Average" line stands out (e.g., by changing its color or thickness).