EXP – 1   STUDY VARIOUS CHARTS WITH ITS USAGE
AIM :
To study various Charts with its usage and prepare the report for the same

Types of Charts :-
Barchart : Bar charts are one of the most common data visualizations. You can use them to quickly compare data across categories, highlight differences, show trends and outliers, and reveal historical highs and lows at a glance. Bar charts are especially effective when you have data that can be split into multiple categories.

Piechart : Pie charts are powerful for adding detail to other visualizations. Alone, a pie chart doesn't give the viewer a way to quickly and accurately compare information. Since the viewer has to create context on their own, key points from your data are missed. Instead of making a pie chart the focus of your dashboard, try using them to drill down on other visualizations.

Linechart : The line chart, or line graph, connects several distinct data points, presenting them as one continuous evolution. Use line charts to view trends in data, usually over time (like stock price changes over five years or website page views for the month). The result is a simple, straightforward way to visualize changes in one value relative to another.

scatter Plot : Scatter plots are the graphs that present the relationship between two variables in a data-set. It represents data points on a two-dimensional plane or on a Cartesian system. The independent variable or attribute is plotted on the X-axis, while the dependent variable is plotted on the Y-axis.

Exp-2   Plotting the graph : Barchart, Piechart, Histogram

Problem statement:
The data for Sector-wise expenditure under Tamil Nadu Budget 2022-23 (in Rs crore) has been given.

   I)   **Find the total % of expenditure for each year and % change from RE 21-22 to BE 22-23. Plot a pie chart for same.**

   II)   **Show the increase or decrease in percentage in 2D bar plot.**

Aim:
To plot the graph : Barchart, Piechart, Histogram

Find the total % of expenditure for each year and % change from RE 21-22 to BE 22-23. Plot a pie chart for same.

1.Total Expenditure : **=sum(D12/E12)**

Percentage Change from RE 21-22 to BE 22-23 : = **D12/E12 [(2021-22RE/2022-23BE)*100]**

Increase or decrease in percentage : =(E2-D2)/E2 [(2022-23BE-2021-22RE)/2022-23BE*100]

2.Show the increase or decrease in percentage in 2D bar plot.

Pie Chart of 2021 - 2022 RE and Pie Chart of 2022-23

Exp-3   Finding mean, median and mode in Excel.

Problem Statement: Load the sales report (please see the screenshot below) at least 15 data, supposing you want to get the average of values in cells C2:C8. For this, use this simple formula:

Aim: To find the mean, median and mode in Excel.

Procedure: 1.**Arithmetic mean, also referred to as average**

- AVERAGE- returns an average of numbers.
- AVERAGEA - returns an average of cells with any data (numbers, Boolean and text values).
- AVERAGEIF - finds an average of numbers based on a single criterion.
- AVERAGEIFS - finds an average of numbers based on multiple criteria.

  1.Average = Average (C2 : C8)   [Results in average of all columns]
     2. AverageIf = AVERAGEIF(A2:A8, C2:C8)   [Banana]
     3.**AVERAGEIFS =** AVERAGEIFS(C2:C8, A3:A8, A17, B2:B8, A18)   [Banana Delivered]

To calculate the mean based on 2 conditions, say, the average of "Banana" sales with the status "Delivered", we use above formulae.
AVERAGEIFS(C2:C8, A2:A8, "Banana", B2:B8, "Delivered")

	A	B	C	D	E	F
1	Item	Status	Amount			
2	Cherry	Delivered	$100			
3	Banana	Delivered	$70			
4	Apple	Delivered	$130			
5	Banana	Delivered	$250			
6	Apple	Cancelled	$90			
7	Cherry	In transit	$115			
8	Banana	In transit	$90			
9						
10	Average	$121	=AVERAGE(C2:C8)			
11	(all items)					
12						
13	Average	$136.67	=AVERAGEIF(A2:A8,A14,C2:C8)			
14	Banana					
15						
16	Average	$160.00	=AVERAGEIFS(C2:C8,A2:A8,A17,B2:B8,A18)			
17	Banana					
18	Delivered					

Median in Excel: In Microsoft Excel, a median is calculated by using the MEDIAN Function for example, to get the median of all arguments in our sales report, use this formula:

= MEDIAN(C2:C8) {[Answer : median $100 = MEDIAN(C2:C8)]}

Mode in Excel: Mode is the most frequently occurring value in the dataset. While the mean & median require some calculations, a mode value can be found simply by calculating the no. of time each value occurs.

- **Note:** In situations where there are two or more modes in your dataset, the Excel Mode function will return the lowest mode.

= MODE (C2:C8) {[Answer: mode $90 =MODE(C2:C8)]}

Exp – 4   Line Graph

Aim: To draw line chart for the selected columns and report the understanding of the data.

Introduction: **Line graphs are a type of data visualization that display the relationship between two variables**. **They are widely used in a variety of fields**, **including business**, **economics**, **and science**, **to present data trends and patterns over time**. **Line graphs are easy to understand and provide a clear visual representation of changes in data over time**.

Construction: **A line graph is made up of a series of points**, **connected by a line**. **The points represent the data values for a particular variable**, **and the line shows the progression of these values over time**. **Line graphs can be used to represent continuous data**, **such as temperature**, **stock prices**, **or sales figures**, **as well as categorical data**, **such as the number of products sold by a company in different regio**n.

1) Enter your data into Excel. First, you need to input your data into Excel. You might have exported the data from elsewhere Or maybe you're inputting it manually. In this experment we are using the below data.

2) Highlight your data and insert your desired graph into the spreadsheet In most situations, it is sufficient to select just one cell for Excel to pick the whole table automatically. If you'd like to plot only part of your data, select that part and be sure to include the column headers in the selection. With the source data selected, go to the Insert tab > Charts group, click the Insert Line or Area Chart icon and choose one of the available graph

Exp-5   BOX PLOT

Aim : To draw Box Plot and and report Q1 ,Q2,Q ranges and identify the outliers.

Procedure:

Box Plot: It is a type of chart that depicts a group of numerical data through their quartiles. It is a simple way to visualize the shape of our data. It makes comparing characteristics of data between categories very easy.

Understanding the components of a box plot : A box plot gives a five-number summary of a set of data which is- • Minimum – It is the minimum value in the dataset excluding the outliers • First Quartile (Q1) – 25% of the data lies below the First (lower) Quartile. • Median (Q2) – It is the mid-point of the dataset. Half of the values lie below it and half above. • Third Quartile (Q3) – 75% of the data lies below the Third (Upper) Quartile. • Maximum – It is the maximum value in the dataset excluding the outliers

Construction : To construct a box plot in power BI we have two methods.
1) Using the Python visual or R script visual. 2) Using inbuild chart of Box Plot (available only for premimum members)
Method – 1 : Using Python visual or R script visual Here we are going to use Python visual to prepare Box Plot for the given data.
Step – 1: Open Power BI < go to "Get data" > load the "tips" dataset.
Step – 2: Ones the data is loaded, you can see different visualizations avaliable on right part of Power BI , select "Python visual" in that.
Step – 3: Enable Python script editor and drag the columns sex, smoker, total_bill into values Box
Step –4: Python script editor will automatically creates a data frame for the above columns and stores it in the variable called "dataset". Then it drops the duplicate values in the dataset.
Step –5: Excetue the following python code , you will get the Box plot.

```
import seaborn as sns
import matplotlib.pyplot as plt
sns.catplot(x='sex', y='total_bill', data=dataset, kind='box', hue='smoker')
plt.show()
```

Method –2 :
Step –1: Load the "tips"dataset into Power BI.
Step –2: Go to visualizations and then to "get more visuals"(it will be in 3 dots)
Step –3: Search "Box and Whisker chart" in search bar and add the Box plot into Power BI interface.

Step –4: Ones the visual is added we are ready to use it.Select the visual and drag the column "day" to Axis , "sex" to Axis Category I, "smoker" to Axis category II and "Total_bill" to value.
Step –5: Ones columns are assigned then Box plot will be generated.To format the resultant Box Plot use "Format your visual"
Step –6: After completing the formating you will get the Final BoxPlot.

Exp – 6
Aim: To plot different charts and format the charts using colors, mentioning legends in power bi.
Procedure:
1) Open Power BI and create a new report.
2) Add data to the report by selecting the appropriate data source and connecting to it.
3) Once the data is added, select the type of chart you want to create. Power BI offers a wide variety of charts, such as bar charts, column charts, line charts, pie charts, etc.
4) Once you have selected the chart type, drag and drop the required fields into the chart.
5) To format the chart, select the chart and go to the "Visualizations" pane on the right-hand side. From there, you can format the chart as per your requirement.
6) You can change the color of the chart by selecting "Data colors" and choosing the desired color palette.
7) You can add a legend to the chart by selecting "Legend" and toggling the "Show" option to "On".
8) You can also customize the legend by selecting "Legend" and changing the position, font size, and color.
9) Repeat steps 3 to 8 to create different types of charts.
10) To add interactivity to the report, you can use filters, slicers, and drill-down features.
11) Once you have created all the charts and added interactivity, save the report.
12) To share the report with others, publish it to Power BI service and share the report link.

Exp-7
Aim: Applying forecasting techniques using power bi.
Procedure:

1.open power bi create a new report

2.add weather data to the report by selecting the appropriate data source and connecting to it

3.once the data is added ,select the line chart (only line chart can be used for forecasting)

4.once the line chart is selected on the report ,we can drag and drop the required fields

5.make sure that the date and time should be in the date format(power bi is able to classify automatically)

6.drag and drop any column in the data set and set the filters to the quarter and year .

7.click analytical tab and there ON the forecasting

8.in the options set the points to the 15 and choose the confidence interval as 95%

(the higher the percentage the correctness of the prediction)

EXP- 8

Aim : To create dynamic charts in power bi.

Procedure:

1) Open Power BI and connect to your data source.

2) Click on the "Visualizations" panel and select "Line and Clustered Column Chart" from the list of visualizations.

3) Drag and drop the fields you want to use for your chart into the "Values" and "Axis" areas of the "Fields" pane.

4) To make the chart dynamic, you can add a slicer to the report page. To do this, select "Slicer" from the "Visualizations" pane, and then drag and drop the field you want to use for the slicer into the "Fields" area.

5) Click on the line in the chart to select it, and then use the "Format" pane to customize the line's appearance, including its color, width, and style.

6) Similarly, click on the bars in the chart to select them, and use the "Format" pane to customize their appearance, including their color and transparency.

7) To add additional data to the chart, drag and drop additional fields into the "Values" and "Axis" areas of the "Fields" pane. You can also add additional series to the chart by dragging and dropping fields into the "Legend" area of the "Fields" pane.

8) Once you're happy with the chart, save your report and share it with others as needed.

EXP-9

Aim: Implementing filters in power bi

Theory:

There are three types of filters in power bi they are

1.visual level filter: only filter the data on a given visual, whether that's a table, chart, card, slicer, etc. These are the most granular filters you can apply to your data, and they operate within the context of both the page-level and report-level filters, which means visual-level filters cannot override them, nor can they be programmed to filter data on other visuals.

2.page level filter: only filter the data on a given page, which makes them useful for creating pages that focus on particular subsets of your data. For example, you can use page-level filters to make one page focus solely on revenue data, while the next page focuses on expense data. Page-level filters operate within the context of the report-level filters, which means that a page-level filter cannot override a report-level filter. They also cannot be programmed to filter the data on other pages.

3.report level filter: are those that affect all of the data in the report, regardless of what you're looking at. Think of them as universal filters.

Procedure:

1.open power bi and create a new report .

2.add data to the report by selecting the appropriate data source and connecting to it.

3.once the data is added,select the type of chart ,such as bar chart,column charts ,line charts,pie charts.

4.once you had selected the chart type,drag and drop the required field into the chart to format the chart ,select the chart and go to the visualisations pane on the right hand side.From there,you can format the chart as per your requirement.

5.if u click on any visualisation it shows filter as three boxes represent filters are

      1.visual level filter

      2.page level filter

      3.report level filter

6.drag and drop any column in the the filters u can see the differences.

 Simultaneously it will apply the filter to all pages

Exp-10

Aim : To create an interactive dashboard for the given data set.

Procedure:

1) Open Power BI and click on "Get Data" to import your dataset. You can choose from various data sources like Excel, CSV, SQL Server, etc.Here are using cricket data which is in csv format.

2) Once you have imported the data, you can create a data model by selecting the relevant columns and defining relationships between tables.

3) Now, you can start creating visualizations for your dashboard. Click on "Visualizations" on the right-hand side and select the type of visualization you want to create.

4) You can drag and drop fields from your data model onto the visualization canvas and customize the formatting as per your

requirement.

5) You can create multiple visualizations and add them to your dashboard.

6) To make your dashboard interactive, you can add slicers that allow users to filter the data based on their requirements.

7) You can also add drill-through functionality to your dashboard to enable users to explore the data in greater detail.

8) Finally, you can publish your dashboard to the Power BI service, where users can access it and interact with it.