ASSIGNMENT 8

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**AIM:** Write an application to draw plots using matplotlib library

**THEORY:**

**Matplotlib**is easy to use and an amazing visualizing library in Python. It is built on NumPy arrays and designed to work with the broader SciPy stack and consists of several plots like line, bar, scatter, histogram, etc.

[**Pyplot**](https://www.geeksforgeeks.org/pyplot-in-matplotlib/) is a Matplotlib module that provides a MATLAB-like interface. Pyplot provides functions that interact with the figure i.e. creates a figure, decorates the plot with labels, and creates a plotting area in a figure.

**Syntax:**

matplotlib.pyplot.plot(\*args, scalex=True, scaley=True, data=None, \*\*kwargs)

Figure class is the top-level container that contains one or more axes. It is the overall window or page on which everything is drawn.

[**Axes class**](https://www.geeksforgeeks.org/matplotlib-axes-class/) is the most basic and flexible unit for creating sub-plots. A given figure may contain many axes, but a given axes can only be present in one figure. The axes() function creates the axes object.

A legend is an area describing the elements of the graph. In simple terms, it reflects the data displayed in the graph’s Y-axis. It generally appears as the box containing a small sample of each color on the graph and a small description of what this data means.

A Legend can be created using the [legend()](https://www.geeksforgeeks.org/matplotlib-pyplot-legend-in-python/) method. The attribute LOC in the legend() is used to specify the location of the legend. The default value of loc is loc=”best” (upper left). The strings ‘upper left’, ‘upper right’, ‘lower left’, ‘lower right’ place the legend at the corresponding corner of the axes/figure.

The attribute bbox\_to\_anchor=(x, y) of legend() function is used to specify the coordinates of the legend, and the attribute ncol represents the number of columns that the legend has. Its default value is 1.

A **bar plot** or bar chart is a graph that represents the category of data with rectangular bars with lengths and heights that is proportional to the values which they represent. It can be created using the **bar()** method.

A **histogram** is basically used to represent data in the form of some groups. It is a type of bar plot where the X-axis represents the bin ranges while the Y-axis gives information about frequency. The [hist()](https://www.geeksforgeeks.org/matplotlib-pyplot-hist-in-python/) function is used to compute and create histogram of x.

Scatter plots are used to observe the relationship between variables and use dots to represent the relationship between them. The [**scatter()**](https://www.geeksforgeeks.org/matplotlib-pyplot-scatter-in-python/) method in the matplotlib library is used to draw a scatter plot.