**Experiment 14**

**Aim:** To implement different types of plots using Numpy and Matplotlob

**Theory :**

Matplotlib is a plotting library for Python. It is used along with NumPy to provide an environment that is an effective open source alternative for MatLab.

Instead of the linear graph, the values can be displayed discretely by adding a format string to the plot() function. Following formatting characters can be used.

|  |  |
| --- | --- |
| **Sr.No.** | **Character & Description** |
| 1 | '-'  Solid line style |
| 2 | '--'  Dashed line style |
| 3 | '-.'  Dash-dot line style |
| 4 | ':'  Dotted line style |
| 5 | '.'  Point marker |
| 6 | ','  Pixel marker |
| 7 | 'o'  Circle marker |
| 8 | 'v'  Triangle\_down marker |
| 9 | '^'  Triangle\_up marker |
| 10 | '<'  Triangle\_left marker |
| 11 | '>'  Triangle\_right marker |
| 12 | '1'  Tri\_down marker |
| 13 | '2'  Tri\_up marker |
| 14 | '3'  Tri\_left marker |
| 15 | '4'  Tri\_right marker |
| 16 | 's'  Square marker |
| 17 | 'p'  Pentagon marker |
| 18 | '\*'  Star marker |
| 19 | 'h'  Hexagon1 marker |
| 20 | 'H'  Hexagon2 marker |
| 21 | '+'  Plus marker |
| 22 | 'x'  X marker |
| 23 | 'D'  Diamond marker |
| 24 | 'd'  Thin\_diamond marker |
| 25 | '|'  Vline marker |
| 26 | '\_'  Hline marker |

The following color abbreviations are also defined.

|  |  |
| --- | --- |
| **Character** | **Color** |
| 'b' | Blue |
| 'g' | Green |
| 'r' | Red |
| 'c' | Cyan |
| 'm' | Magenta |
| 'y' | Yellow |
| 'k' | Black |
| 'w' | White |

**Conclusion:** Thus studied different types of plot using numpy and matplot.

**Question:**

1. **Name and explain different types of plot.**

**Ans**

1.line plot

A line plot, also called a dot plot, is a graph that shows the frequency, or the number of times, a value occurs in a data set.This dot plot contains a random dataset.

A dot plot displaying a random dataset.Line plots are constructed with each value recorded along the horizontal axis, also called the x-axis. These values can be measurements, weekdays, months, colors, sports, types of food, or anything else one wants to record with a line plot. The number of times each value occurs is marked above that value on the plot. There are a few ways of doing this. A person might draw an X or dot above the value for each occurrence, or a single dot that corresponds to a number written on the vertical y-axis. All line plots should have a title to indicate what data the plot shows.

2.Scatter plots

A scatter plot is a chart type that is normally used to observe and visually display the relationship between variables. The values of the variables are represented by dots. The positioning of the dots on the vertical and horizontal axis will inform the value of the respective data point; hence, scatter plots make use of Cartesian coordinates to display the values of the variables in a data set. Scatter plots are also known as scattergrams, scatter graphs, or scatter charts.

3.Data Distubtion Plot

Distribution plots visually assess the distribution of sample data by comparing the empirical distribution of the data with the theoretical values expected from a specified distribution. Use distribution plots in addition to more formal hypothesis tests to determine whether the sample data comes from a specified distribution. To learn about hypothesis tests, see Hypothesis Testing.

Statistics and Machine Learning Toolbox™ offers several distribution plot options:

Normal Probability Plots — Use normplot to assess whether sample data comes from a normal distribution. Use probplot to create Probability Plots for distributions other than normal, or to explore the distribution of censored data.

Quantile-Quantile Plots — Use qqplot to assess whether two sets of sample data come from the same distribution family. This plot is robust with respect to differences in location and scale.

Cumulative Distribution Plots — Use cdfplot or ecdf to display the empirical cumulative distribution function (cdf) of the sample data for visual comparison to the theoretical cdf of a specified distribution.