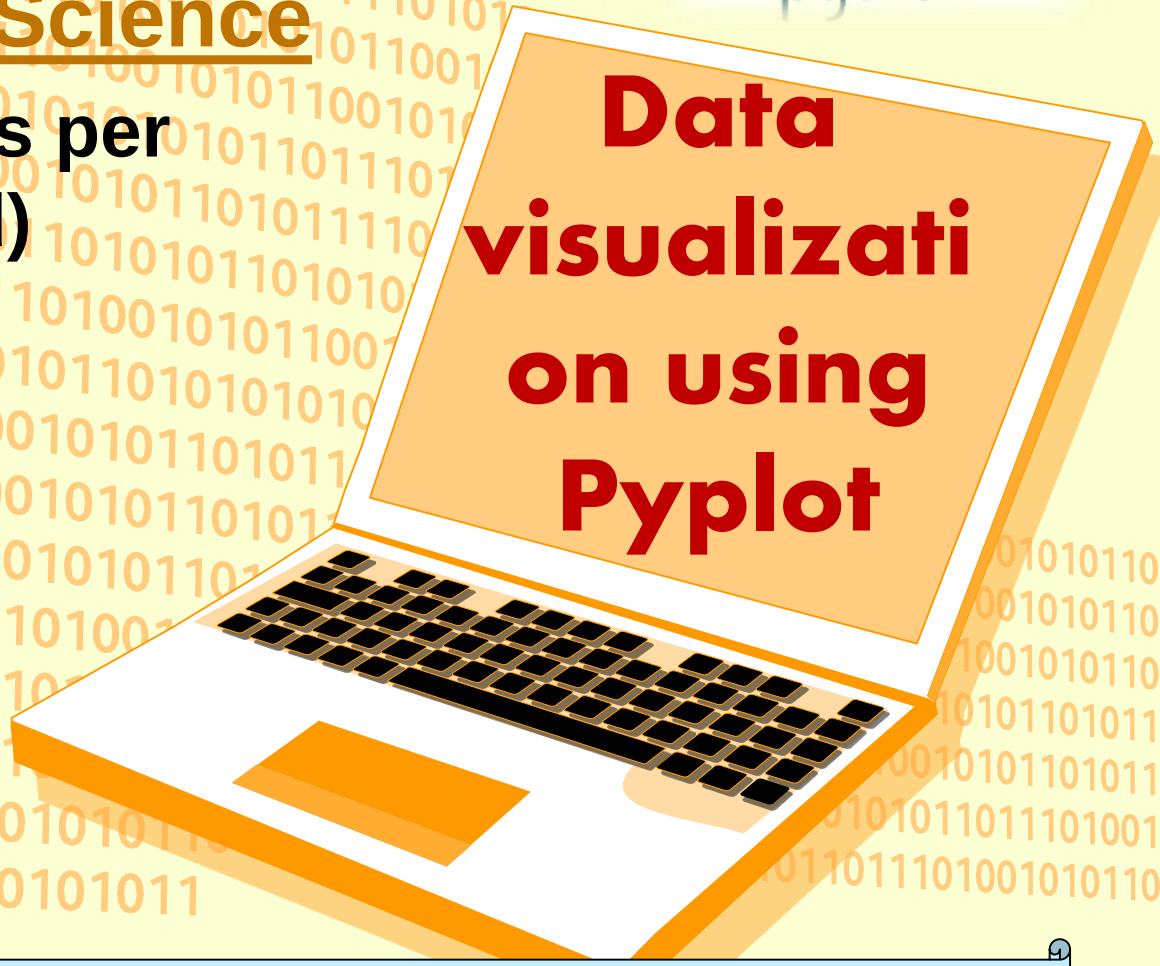
Chapter 7 :

Computer Science

Class XII (As per CBSE Board)



New Syllabus 2019-20

Visit : python.mykvs.in for regular updates

Data visualization using Pyplot

Matplotlib is the whole python package/ library used to create 2D graphs and plots by using python scripts. **pyplot** is a module in matplotlib, which supports a very wide variety of graphs and plots namely - histogram, bar charts, power spectra, error charts etc. It is used along with NumPy to provide an environment for MatLab.

Pyplot provides the state-machine interface to the plotting library in matplotlib.It means that figures and axes are implicitly and automatically created to achieve the desired plot. For example, calling plot from pyplot will automatically create the necessary figure and axes to achieve the desired plot. Setting a title will then automatically set that title to the current axes object.The pyplot interface is generally preferred for non-interactive plotting (i.e., scripting).

Data visualization using Pyplot

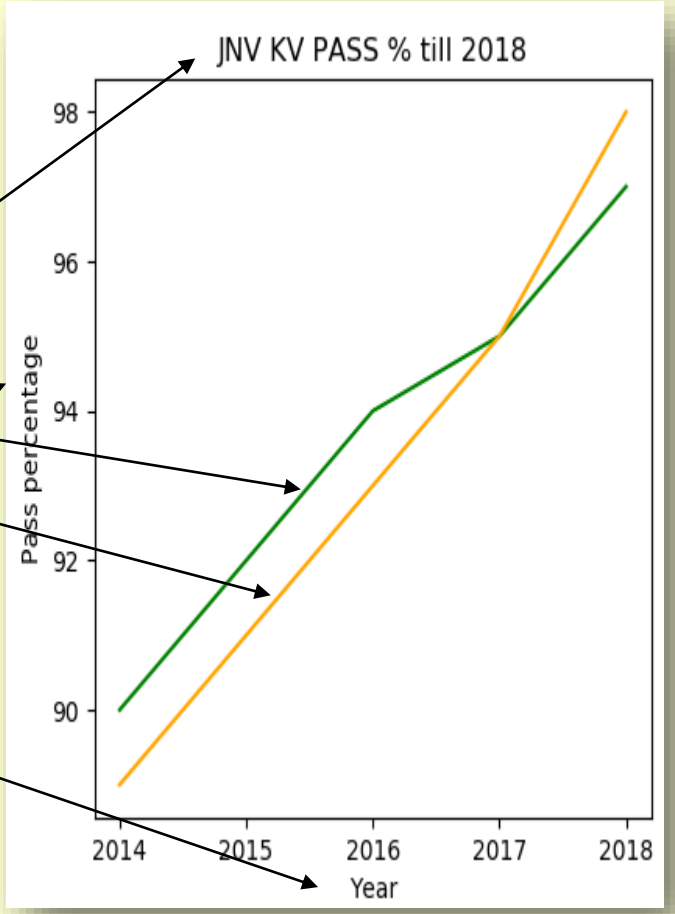
Line Chart

The line chart is represented by a series of datapoints connected with a straight line.Generally line charts are used to display trends over time. A line chart or line graph can be created using the plot() function available in pyplot library.We can not only just plot a line but we can explicitly define the grid, the x and y axis scale and labels, title and display options.

Data visualization using Pyplot

Line Chart
E.G.PROGRAM

```
import numpy as np
import matplotlib.pyplot as plt
year = [2014,2015,2016,2017,2018]
jnvpasspercentage = [90,92,94,95,97]
kvpasspercentage = [89,91,93,95,98]
plt.plot(year, jnvpasspercentage, color='g')
plt.plot(year, kvpasspercentage, color='orange')
plt.xlabel('Year')
plt.ylabel('Pass percentage')
plt.title('JNV KV PASS % till 2018')
plt.show()
```



Note:- As many lines required call plot() function multiple times with suitable arguments.

Data visualization using Pyplot

Pie Chart

A pie graph/pie chart is a specialized graph used in statistics. The independent variable is plotted around a circle.

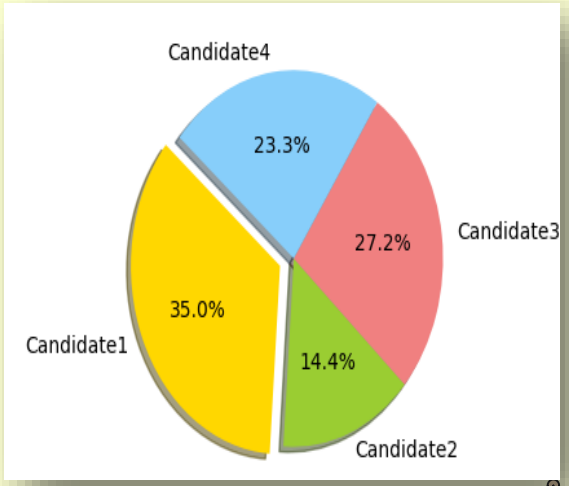
Pie Charts shows proportions and percentages between categories, by dividing a circle into proportional segments/parts. Each arc length represents a proportion of each category, while the full circle represents the total sum of all the data, equal to 100%

Data visualization using Pyplot

Pie Chart

e.g.program

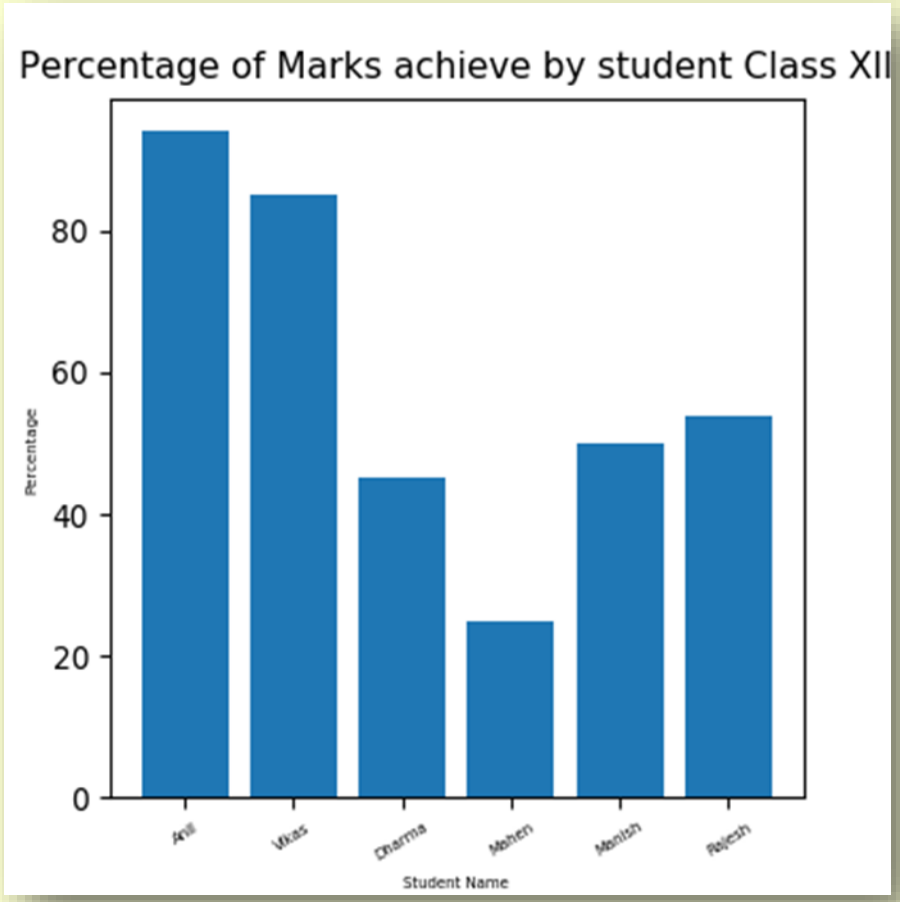
```
import matplotlib.pyplot as plt
# Data to plot
labels = 'Candidate1', 'Candidate2', 'Candidate3', 'Candidate4'
votes = [315, 130, 245, 210]
sizes=votes
colors = ['gold', 'yellowgreen', 'lightcoral', 'lightskyblue']
explode = (0.1, 0, 0, 0)  # explode 1st slice
# Plot
plt.pie(sizes, explode=explode, labels=labels, colors=colors,
        autopct='%1.1f%%', shadow=True, startangle=140)
plt.axis('equal')
plt.show()
```



Data visualization using Pyplot

Bar Chart

A bar chart/bar graph, is a very commo two-dimensional data visualization made up of rectangular bars, each for a specific category and it's length represents the value of that category.



Plotting with Pyplot

Plot bar graphs
e.g program

```
import matplotlib.pyplot as plt
import numpy as np
label = ['Anil', 'Vikas', 'Dharma',
'Mahen', 'Manish', 'Rajesh']
per = [94,85,45,25,50,54]
index = np.arange(len(label))
plt.bar(index, per)
plt.xlabel('Student Name', fontsize=5)
plt.ylabel('Percentage', fontsize=5)
plt.xticks(index, label, fontsize=5,
rotation=30)
plt.title('Percentage of Marks achieve
by student Class XII')
plt.show()
```