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ENGINEERING COLLEGE

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ROLL NO : 127
BATCH : S23

ASSIGNMENT 6. DATA VISUALIZATION (MATPLOTLIB)

AIM : Write Python code to demonstrate the use of Data Visualization (Matplotlib).

CODE :

```
#Draw a line in a diagram from position (0,0) to position
(9,300):
import
matplotlib.pyplot as
pit import numpy as np

xpoints = np.array([0,
9]) ypoints =
np.array([0, 300])

pit.plot(xpoints,
ypoints) pit.show()


#Draw two points in the
diagram. import
matplotlib.pyplot as pit
import numpy as np
```

```
xpoints =
np.array([1,5])
ypoints =
np.array([13,1])

pit.plot(xpoints,
ypoints, 'o')
pit.show()

#Multiple point
xpoints =
np.array([1,2,5,7])
ypoints =
np.array([3,7,1,15])

pit.plot(xpoints,
ypoints) pit.show()

#Default x points ypoints
=
np.array([3,7,5,12,15,21])

pit.plot(ypoints)
pit.show() #Mark
each point with a
circle: import
matplotlib.pyplot
as plt import numpy
as np ypoints =
np.array([13, 7,
11, 1])
plt.plot(ypoints,
marker = '*')
plt.show()

#Dashed Line
import matplotlib.pyplot
as plt import numpy as
np ypoints =
np.array([13, 4, 11, 3])
```

```
plt.plot(ypoints, 'o-
.r') plt.show()


##Encircled Points import
matplotlib.pyplot as plt import
numpy as np ypoints = np.array([13,
2, 11, 7]) plt.plot(ypoints, marker
= 'o', ms = 20, mec = 'r')
plt.show()

import matplotlib.pyplot
as plt import numpy as
np ypoints =
np.array([2, 5, 11, 10])
plt.plot(ypoints, color
= 'b') plt.show()

#Intersecting Lines
import
matplotlib.pyplot as
plt import numpy as np
y1 = np.array([13, 18,
1, 10]) y2 =
np.array([6, 12, 17,
11])
plt.plot(y1)
plt.plot(y2)
plt.show()

#Names Axis and Title
import numpy as np
import matplotlib.pyplot as plt x =
np.array([80, 85, 90, 95, 100, 105, 110, 115,
120, 125]) y = np.array([240, 250, 260, 270,
280, 290, 300, 310, 320, 330]) plt.plot(x, y)
plt.title("Runner Data")
plt.xlabel("Heart
Rate")
plt.ylabel("Meters(m)"
) plt.show()
```

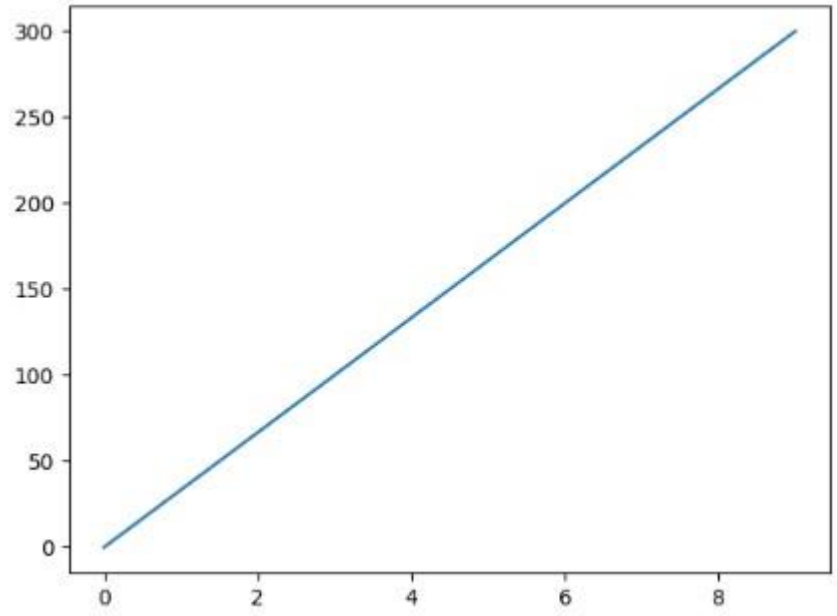
```
#Use of Grids
import numpy as
np
import matplotlib.pyplot as plt x =
np.array([80, 85, 90, 95, 100, 105, 110, 115,
120, 125]) y = np.array([240, 250, 260, 270,
280, 290, 300, 310, 320, 330]) plt.plot(x, y)
plt.title("Runner Data") plt.xlabel("Heart
Rate") plt.ylabel("Meters(m)") plt.grid()
plt.plot(x, y) plt.show()

#Subplot() Function
import
matplotlib.pyplot as
plt import numpy as np
#plot 1:
x = np.array([0,
1, 2, 3]) y =
np.array([3, 8, 1,
10])
plt.subplot(2, 1,
1) plt.plot(x,y)
#plot 2:
x = np.array([10,
11,3, 3]) y =
np.array([10, 20, 30,
40]) plt.subplot(2,
1, 2) plt.plot(x,y)
plt.show()

import
matplotlib.pyplot as
plt import numpy as np
#plot 1:
x = np.array([0,
1, 2, 3]) y =
np.array([3, 8, 1,
10])
plt.subplot(1, 2,
1) plt.plot(x,y)
```

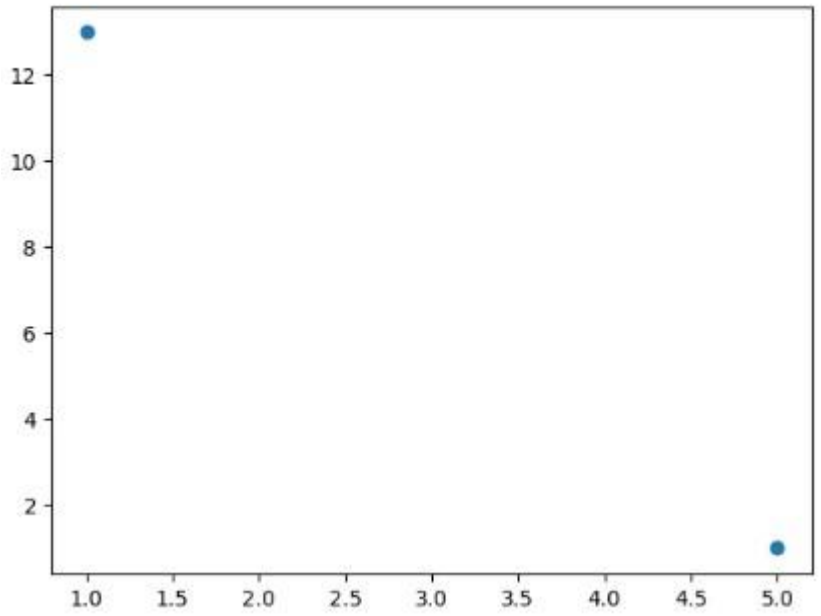
```
plt.title("SALES")
#plot 2:
x = np.array([0, 1,
2, 3]) y =
np.array([10, 20, 30,
40]) plt.subplot(1,
2, 2) plt.plot(x,y)
plt.title("INCOME")
plt.suptitle("MY
SHOP") plt.show()

#Plot of two graphs
import
matplotlib.pyplot as
plt import numpy as np
#day one, the age and speed of 13 cars:
x =
np.array([5,7,8,7,2,17,2,9,4,11,12,9,6]) y
=
np.array([99,86,87,88,111,86,103,87,94,78,7
7,85,86]) plt.scatter(x, y)
#day two, the age and speed of 15 cars:
x = np.array([2,2,8,1,15,8,12,9,7,3,11,4,7,14,12])
y =
np.array([100,105,84,105,90,99,90,95,94,100,79,112
,91,80,85]) plt.scatter(x, y) plt.show()


#Graphs import sys
import matplotlib
matplotlib.use('Agg')
import
matplotlib.pyplot as
plt import numpy as np
x = ["APPLES",
"BANANAS"] y = [250,
350]
plt.bar(x, y)
plt.show()
```

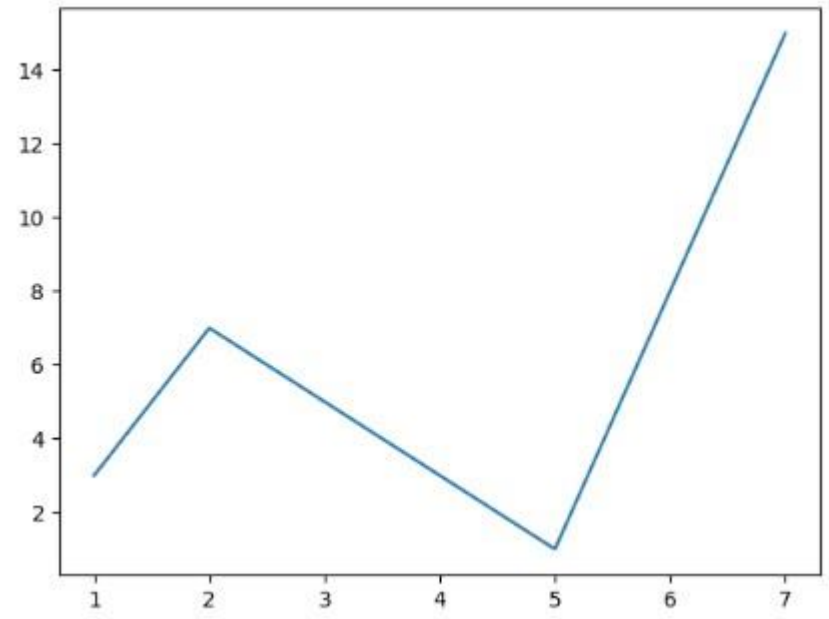
```
import
matplotlib.pyplot as
plt import numpy as np
x = np.array(["A", "B",
"C", "D"]) y =
np.array([8, 18, 9, 19])
plt.barh(x, y, height =
0.2) plt.show()

#Joint Graphs import
matplotlib.pyplot as plt
import numpy as np x =
np.random.normal(190, 90,
250)
plt.hist(x)
plt.show()
#Pie Chart
import
matplotlib.pyp
lot as plt
import numpy
as np y =
np.array([35,
25, 25, 15])
mylabels =
["Apples",
"Bananas",
"Cherries",
"Dates"]
plt.pie(y,
labels =
mylabels,
startangle =
90) plt.show()

#Exploding pie import matplotlib.pyplot as plt
import numpy as np y = np.array([35, 25, 25, 15])
mylabels = ["Apples", "Bananas", "Cherries",
"Dates"] myexplode = [0.2, 0, 0, 0] plt.pie(y,
labels = mylabels, explode = myexplode, shadow =
True) plt.show()
```

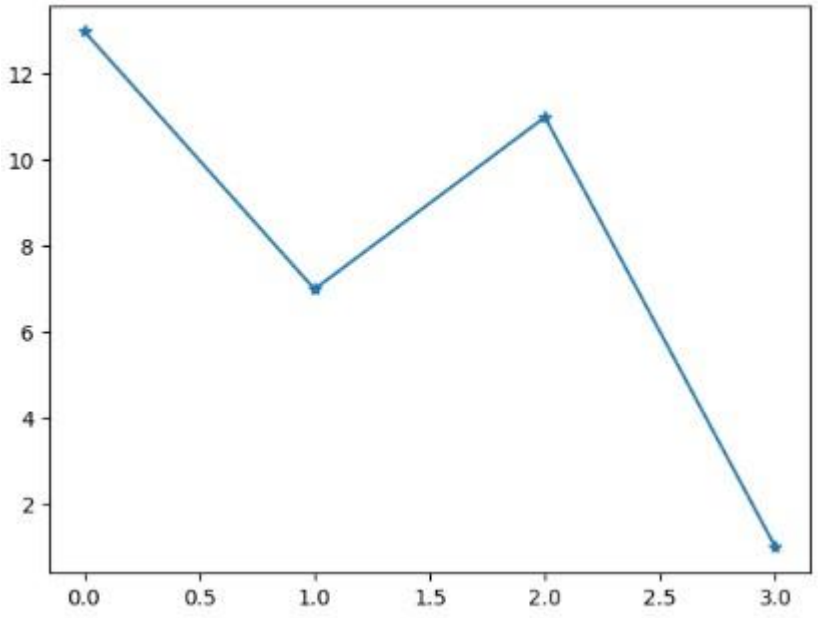
```
#Pie Chart with Tables import
matplotlib.pyplot as plt import numpy as
np y = np.array([35, 25, 25, 15])
mylabels = ["Apples", "Bananas",
"Cherries", "Dates"] plt.pie(y, labels =
mylabels) plt.legend(title = "Four
Fruits:") plt.show()
```

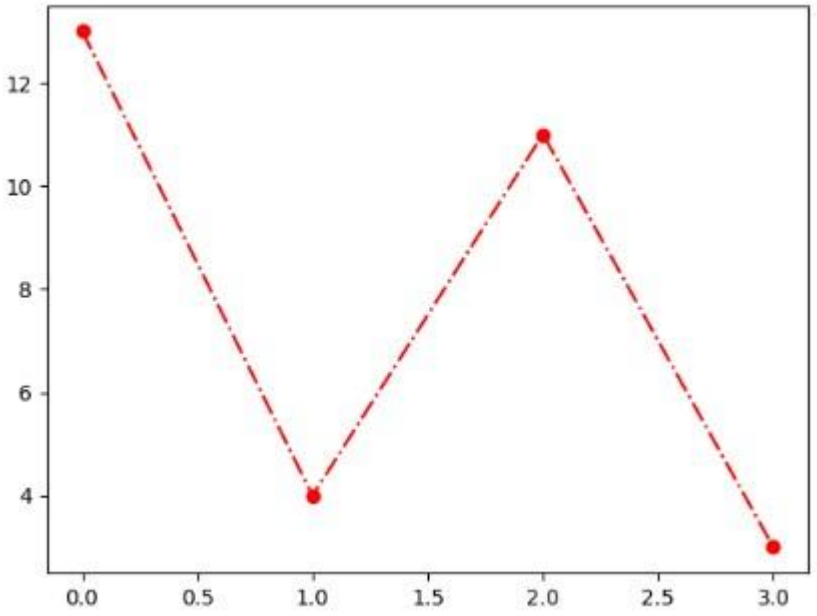
OUTPUT :

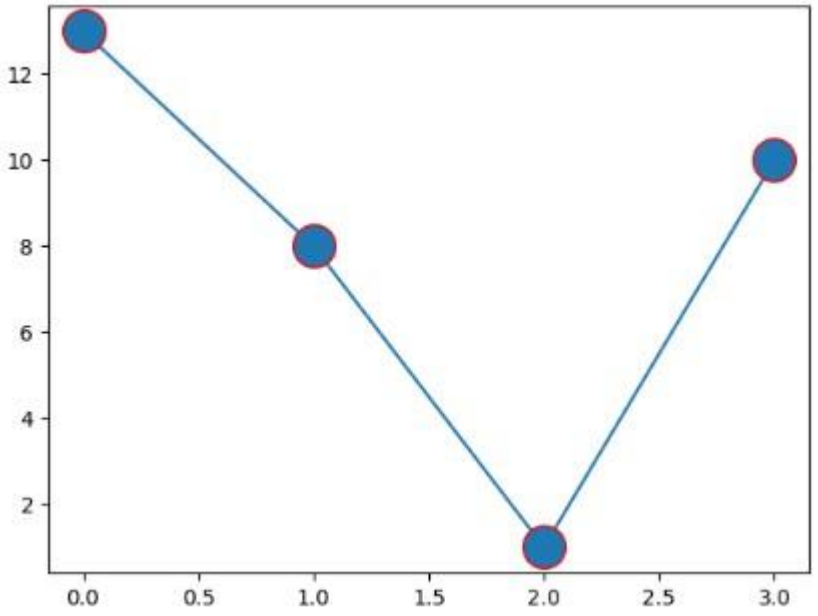


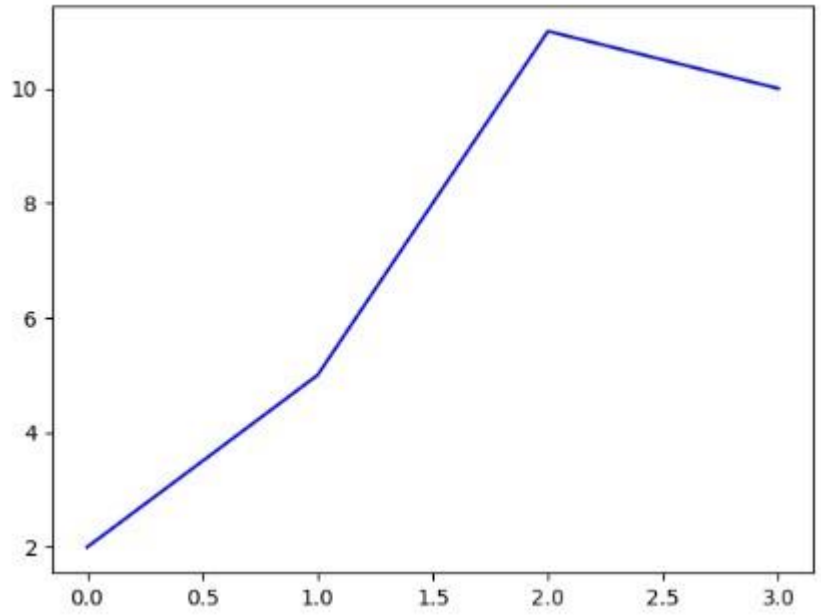

12
10
8
6
4
2
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

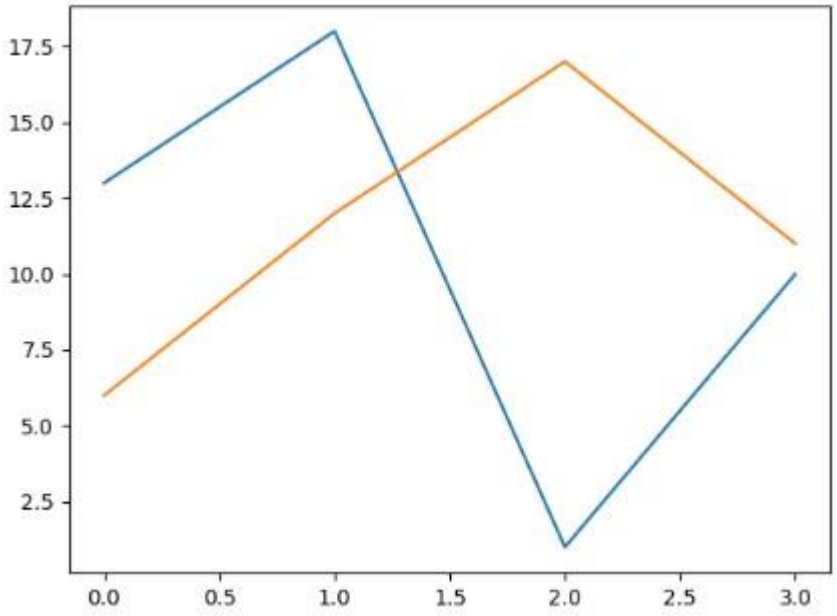

14
12
10
8
6
4
2
1
2
3
4
5
6
7

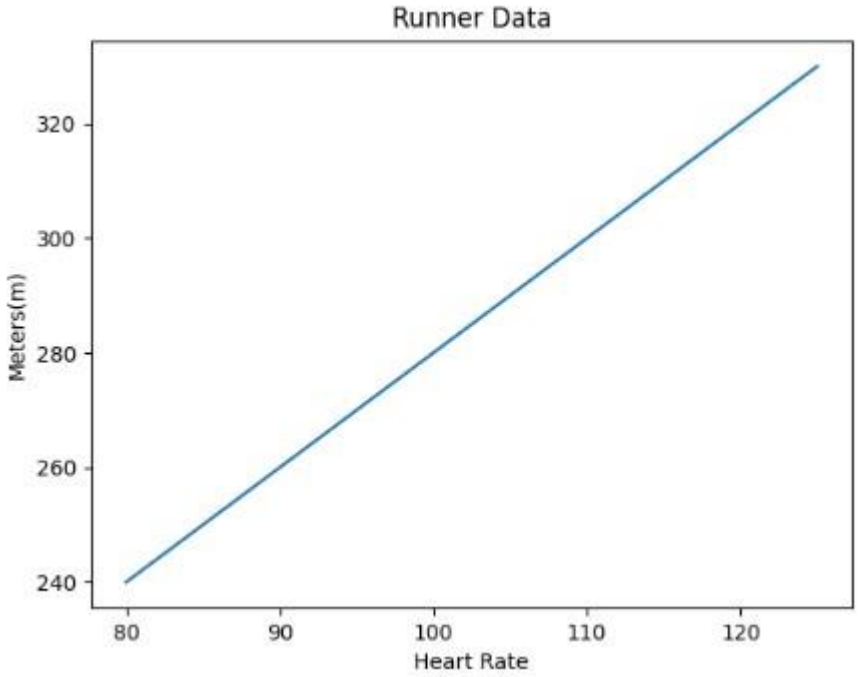

12
10
8
6
4
2
0.0
0.5
1.0
1.5
2.0
2.5
3.0

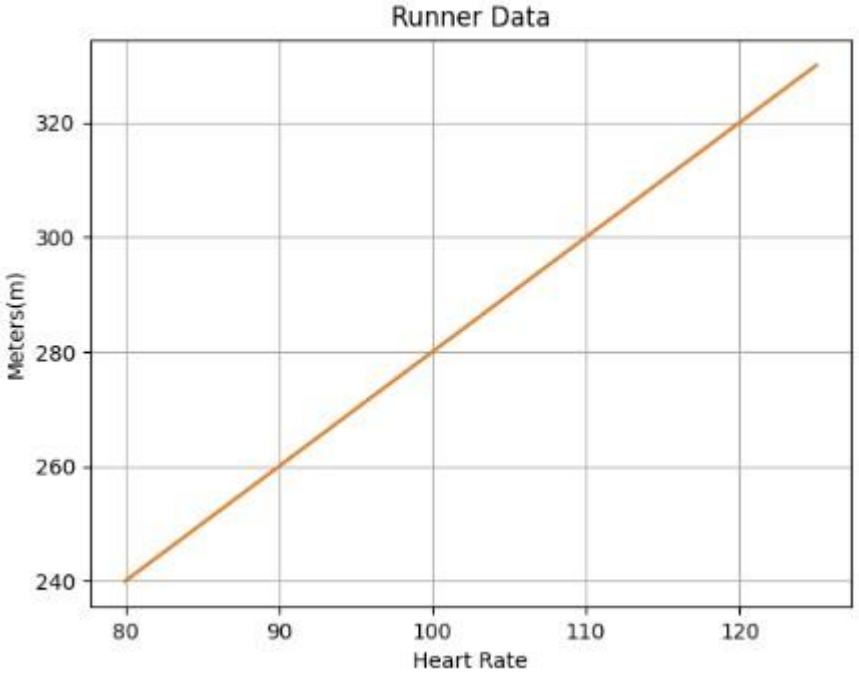

12
10
8
6
4
0.0
0.5
1.0
1.5
2.0
2.5
3.0

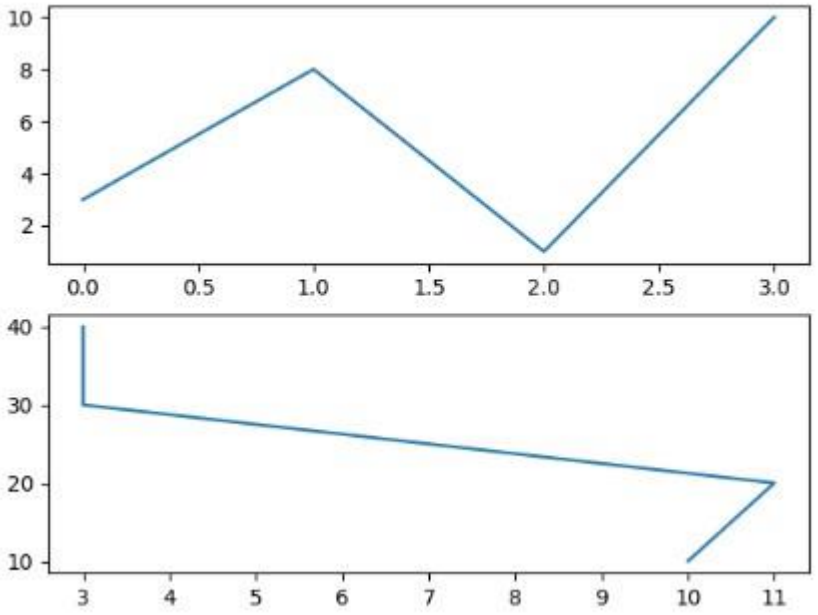

12
10
8
6
4
2
0.0
0.5
1.0
1.5
2.0
2.5
3.0


10
8
6
4
2
0.0
0.5
1.0
1.5
2.0
2.5
3.0

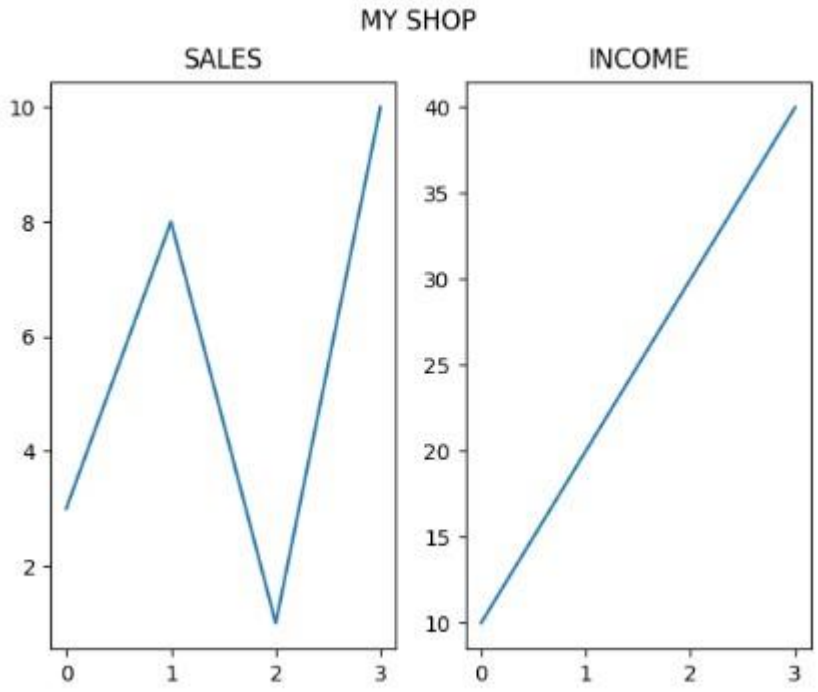

17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
0.5
1.0
1.5
2.0
2.5
3.0

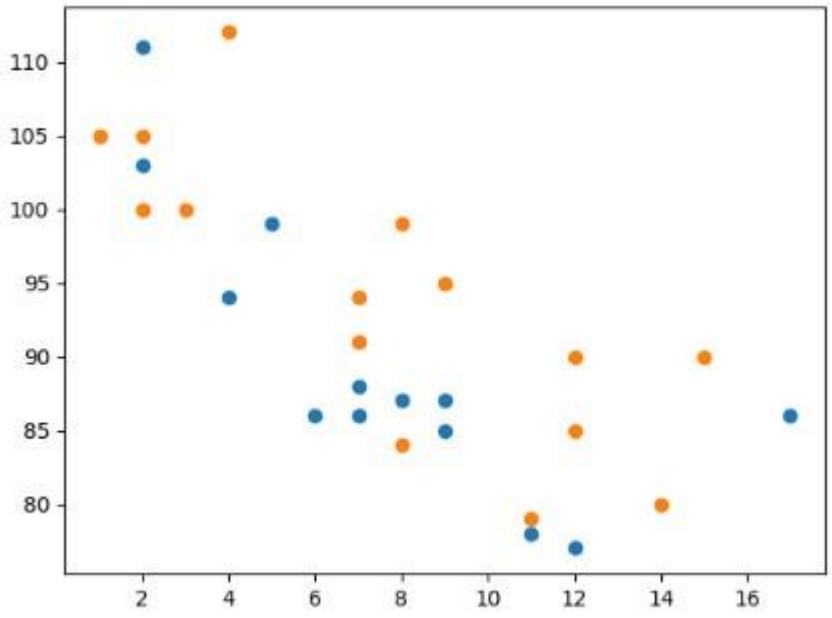

Runner Data
Meters(m)
320
300
280
260
240
80
90
100
110
120
Heart Rate

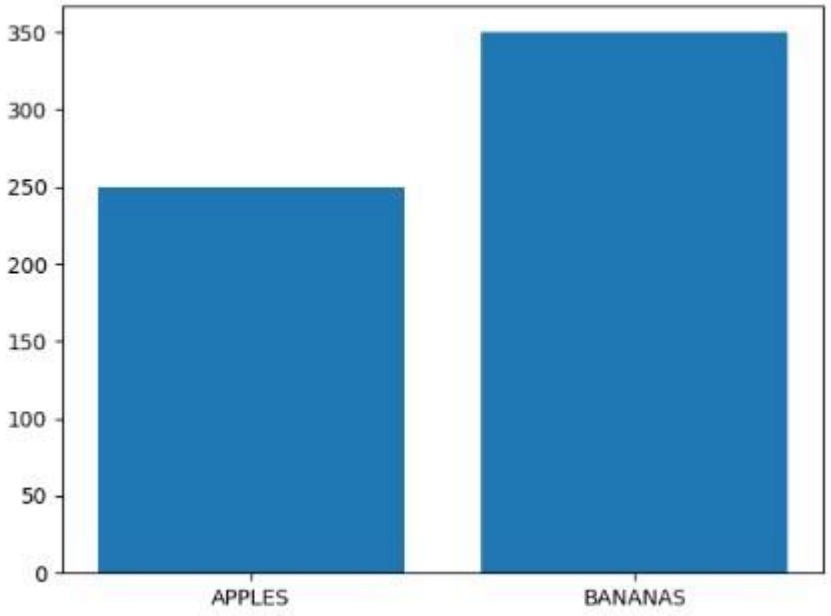

Runner Data
Meters(m)
320
300
280
260
240
80
90
100
110
120
Heart Rate

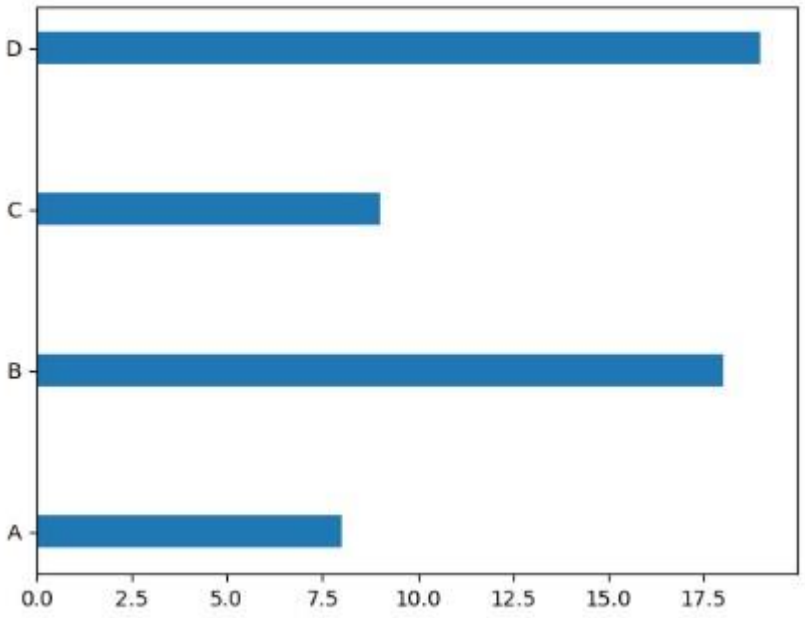

10
8
6
4
2
0.0
0.5
1.0
1.5
2.0
2.5
3.0

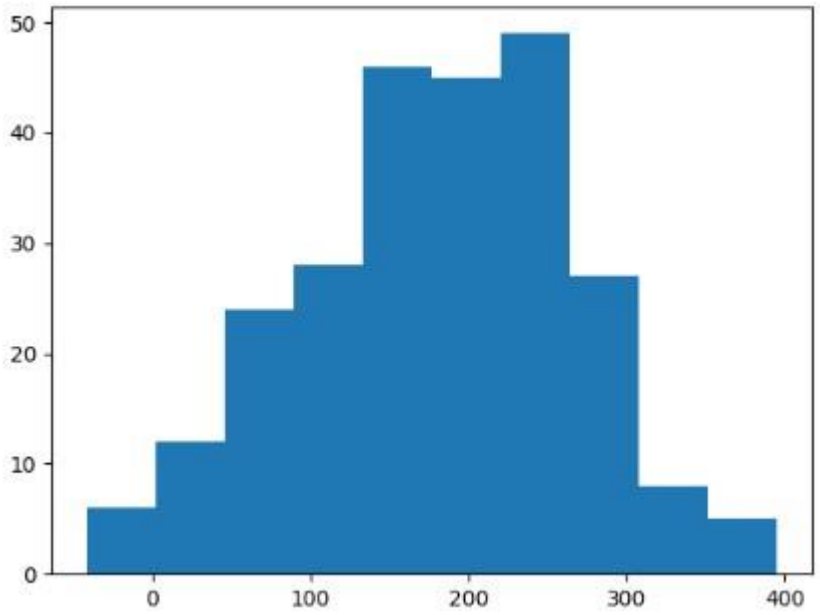
40
30
20
10
3
4
5
6
7
8
9
10
11

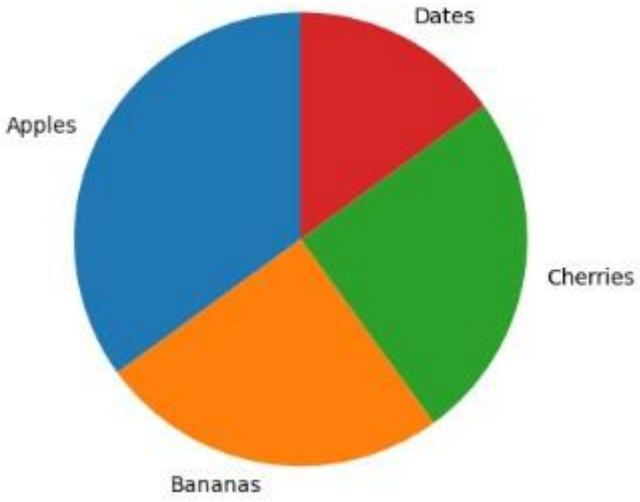

MY SHOP
SALES
INCOME
10
8
6
4
2
0
1
2
3
40
35
30
25
20
15
10
0
1
2
3

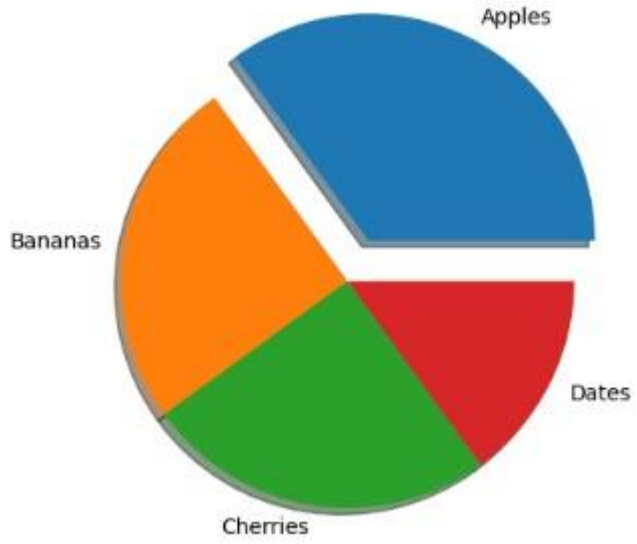

110
105
100
95
90
85
80
2
4
6
8
10
12
14
16

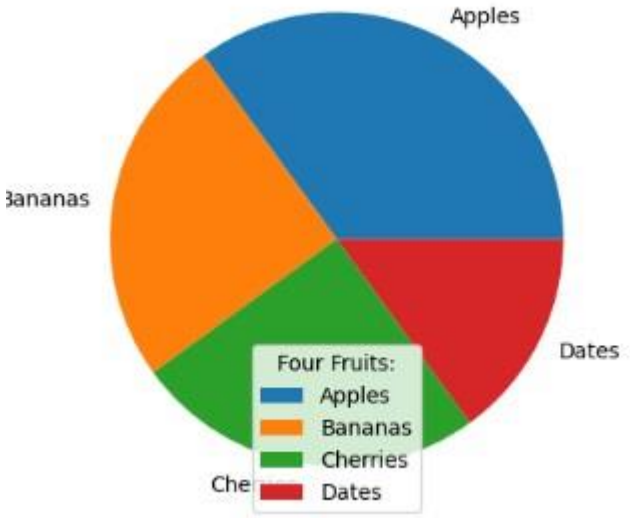

350
300
250
200
150
100
50
0
APPLES
BANANAS


D
C
B
A
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5


50
40
30
20
10
0
0
100
200
300
400


Dates
Apples
Cherries
Bananas


Apples
Bananas
Dates
Cherries


Apples
Bananas
Dates
Four Fruits:
Apples
Bananas
Cherries
Dates