

XII - IP- RECORD (2025.26)

PYTHON RECORD PROGRAMS

1. Create a panda's series from a dictionary of values and a ndarray

Program:

```
import pandas as pd
import numpy as np
d={'Jan':31,'Feb':28,'Mar':31,'Apr':30,'May':31}
S1=pd.Series(d)
print("Series from Dictionary")
print(S1)
ar=np.array([10,20.5,30,40,50])
print("\nSeries from ndarray")
S2=pd.Series(ar)
print(S2)
```

Output

```
Series from Dictionary
Jan  31
Feb  28
Mar  31
Apr  30
May  31
dtype: int64
```

```
Series from ndarray
0  10.0
1  20.5
2  30.0
3  40.0
4  50.0
dtype: float64
```

2. Given a Series, print all the elements, whose average is ≥ 75 .

Program:

```
import pandas as pd
snames=[]
smarks=[]
n=int(input("How many students averages you want to store? "))
for i in range(0,n):
    name=input("Enter the name of the student: ")
    snames.append(name)
    mark=int(input("Enter the average of the student: "))
    smarks.append(mark)
S=pd.Series(data=smarks,index=snames)
print("\nDetails of the students whose average is more than 75 : ")
print(S[S>=75])
```

Output

```
How many students averages you want to store? 4
Enter the name of the student: Mohan
Enter the average of the student: 55
Enter the name of the student: Pavan
```

Enter the average of the student: 85
Enter the name of the student: Kumar
Enter the average of the student: 70
Enter the name of the student: Rajesh
Enter the average of the student: 90

Details of the students whose average is more than 75 :

Pavan 85
Rajesh 90
dtype: int64

3. Write a program to perform the following operations on the Series Object 'Veg'.

Given Data:

Beetroot	40
Carrot	60
Drumstick	10
Brinjal	50

- (i) Create and display the Series
- (ii) Modify the Carrot value to 90.
- (iii) Add the row "Tomato" with value 30.
- (iv) Rename index "Brinjal" to "PennadaBrinjal"
- (v) Fetch first 3 rows using head function

Program:

```
import pandas as pd
Veg=["Beetroot","Carrot","Drumstick","Brinjal"]
Rates=[40,60,10,50]
Veg=pd.Series(data=Rates, index=Veg)
print("\nOperations on Series \n")
print("1.Created Series\n",Veg)
Veg["Carrot"]=90
print("\n2.Series after modifying the Carrot value\n", Veg)
Veg["Tomato"]=30
print("\n3.Series after adding Tomato details\n", Veg)
Veg.index=['Beetroot','Carrot','Drunstick','PennadaBrinjal','Tomato']
#Veg = Veg.rename(index={'Brinjal': 'PeddadaBrinjal'})
print("\n4.Series After modifying Brinjal index\n", Veg)
print("\n5.Fetching first 3 rows using Head function\n", Veg.head(3))
```

Output

Operations on Series

1.Created Series

Beetroot 40
Carrot 60
Drumstick 10
Brinjal 50
dtype: int64

2.Series after modifying the Carrot value

Beetroot 40
Carrot 90
Drumstick 10
Brinjal 50
dtype: int64

3.Series after adding Tomato details

```

Beetroot 40
Carrot 90
Drumstick 10
Brinjal 50
Tomato 30
dtype: int64

```

4. Series After modifying Brinjal index

```

Beetroot 40
Carrot 90
Drunstick 10
PennadaBrinjal 50
Tomato 30
dtype: int64

```

5. Fetching first 3 rows using Head function

```

Beetroot 40
Carrot 90
Drunstick 10
dtype: int64

```

4. Write a program to perform the following operations on the 2 Series Objects 'Week1' and 'Week2' (Sunday to Wednesday)

Given Data:

Index	Data
Sun	100
Mon	150
Tue	120
Wed	130

Week1

Index	Data
Sun	70
Mon	80
Tue	90
Wed	95

Week2

1. Create a Series Week1 (Sales of bananas in Week1 – Sunday to Wednesday)
2. Create a Series Week2 (Sales of bananas in Week2 – Sunday to Wednesday)
3. Create a Series "Total" with total sales of two weeks
4. Change the Week 1 - Wednesday Sales Details Value to 30.
5. Show the Week 2 - Monday to Tuesday Sales Details using Slicing

Program:

```

import pandas as pd
Days=["Sun","Mon","Tue","Wed"]
W1sales=[100,150,120,130]
W2sales=[70,80,90,95]
Week1=pd.Series(data=W1sales,index=Days)
Week2=pd.Series(data=W2sales,index=Days)
print("\n1.Series Object - Week1 :\n",Week1)
print("\n2.Series Object - Week2 :\n",Week2)
Total=Week1+Week2

```

```
print("\n3. Series Object - Total :\n",Total)
Week1["Wed"]=250
print("\n4. Week1 Details after modifying Wednesday Sales \n",Week1)
print("\n5. Week2 - Monday to Tuesday Details:\n",Week2[1:3])
```

OUTPUT

1.Series Object - Week1 :

```
Sun 100
Mon 150
Tue 120
Wed 130
dtype: int64
```

2.Series Object - Week2 :

```
Sun 70
Mon 80
Tue 90
Wed 95
dtype: int64
```

3. Series Object - Total :

```
Sun 170
Mon 230
Tue 210
Wed 225
dtype: int64
```

4. Week1 Details after modifying Wednesday Sales

```
Sun 100
Mon 150
Tue 120
Wed 250
dtype: int64
```

5. Week2 - Monday to Tuesday Details:

```
Mon 80
Tue 90
dtype: int64
```

5. Write a program to create the following two Series Objects ‘S1’ and ‘S2’ and perform the following operations:

S1	S2
10	1
20	2
30	3
40	4

- (1) Create the above 2 series objects and display it.
- (2) Perform Arithmetic Addition Operation (S1+S2)
- (3) Perform Arithmetic Subtraction Operation (S1-S2)
- (4) Perform Arithmetic Multiplication Operation (S1*S2)
- (5) Perform Arithmetic Division Operation (S1/S2)

Also write the outputs.

Program:

```
import pandas as pd
S1=pd.Series([10,20,30,40])
```

```

S2=pd.Series([1,2,3,4])
print("1.Displaying Series 1.....")
print(S1)
print("\n Displaying Series 2.....")
print(S2)
print("\n2.Displaying Series 1 + Series 2...Arithmetic Addition")
print(S1+S2)
print("\n3.Displaying Series 1 - Series 2...Arithmetic Subtraction")
print(S1-S2)
print("\n4.Displaying Series 1 X Series 2...Arithmetic Multiplication")
print(S1*S2)
print("\n5.Displaying Series 1 / Series 2...Arithmetic Division")
print(S1/S2)

```

Output

1.Displaying Series 1.....

```

0 10
1 20
2 30
3 40
dtype: int64

```

Displaying Series 2.....

```

0 1
1 2
2 3
3 4
dtype: int64

```

2.Displaying Series 1 + Series 2...Arithmetic Addition

```

0 11
1 22
2 33
3 44
dtype: int64

```

3.Displaying Series 1 - Series 2...Arithmetic Subtraction

```

0 9
1 18
2 27
3 36
dtype: int64

```

4.Displaying Series 1 X Series 2...Arithmetic Multiplication

```

0 10
1 40
2 90
3 160
dtype: int64

```

5.Displaying Series 1 / Series 2...Arithmetic Division

```

0 10.0
1 10.0
2 10.0
3 10.0
dtype: float64

```

6. Write a Program to create

(a) A Dataframe DF1 using Dictionary having values as lists and display it

	Pavan	Srinu
Telugu	56	90
English	75	91
Maths	82	98

DF1

(b) Add a new Row with index “Social” with values 79, 89 in DF1

(c) A Dataframe DF2 using a list having list of lists

	BookName	Price
One	C++	550
Two	Python	625
Three	Java	525

DF2

(d) Delete row with index “Three” from DF2.

Program:

```
import pandas as pd
marks={'Pavan':[56,75,82],'Srinu':[90,91,98]}
DF1=pd.DataFrame(marks,index=['Telugu','English','Maths'])
print("Displaying Dataframe DF1\n",DF1)
DF1.loc["Science"]=79,89
print("\nDataframe DF1 after adding Science Details...\n",DF1)
books=[['C++',550],['Python',625],['Java',525]]
DF2=pd.DataFrame(books,columns=['BookName','Price'],index=['One','Two','Three'])
print("\nDisplaying Dataframe DF2\n",DF2)
DF2.drop('Three',inplace=True)
print("\nDataframe DF2 after removing Three Details...\n",DF2)
```

Output

Displaying Dataframe DF1

```
      Pavan Srinu
Telugu   56   90
English   75   91
Maths    82   98
```

Dataframe DF1 after adding Social Details...

```
      Pavan Srinu
Telugu   56   90
English   75   91
Maths    82   98
Science   79   89
```

Displaying Dataframe DF2

```
      BookName Price
One      C++   550
Two     Python   625
Three    Java   525
```

Dataframe DF2 after removing Three Details...

```
      BookName Price
One      C++   550
Two     Python   625
```

7. Create the following dataframe for examination result and display it. (Dataframe Attributes)

Given Data:

	Pavan	Srinu
Telugu	56	90
English	75	91
Maths	82	98

Also perform the following:

- (1) Create the dataframe and display it
- (2) Display row labels
- (3) Display column labels
- (4) Display data types of each column
- (5) Display dimension of dataframe
- (6) Display Shape of the Dataframe

Program:

```
import pandas as pd
marks={'Pavan':[56,75,82],'Srinu':[90,91,98]}
df=pd.DataFrame(marks,index=['Telugu','English','Maths'])
print("\n1.Displaying DataFrame:\n",df)
print("\n2.Displaying Row labels:\n",df.index)
print("\n3.Displaying Column labels:\n",df.columns)
print("\n4.Displaying Datatypes of each column:\n",df.dtypes)
print("\n5.Displaying Dimension of Dataframe:\n",df.ndim)
print ("\n6.Shape of the Dataframe:\n",df.shape)
```

Output

1.Displaying DataFrame:

```
   Pavan  Srinu
Telugu   56   90
English   75   91
Maths    82   98
```

2.Displaying Row labels:

```
Index(['Telugu', 'English', 'Maths'], dtype='object')
```

3.Displaying Column labels:

```
Index(['Pavan', 'Srinu'], dtype='object')
```

4.Displaying Datatypes of each column:

```
Pavan  int64
Srinu  int64
dtype: object
```

5.Displaying Dimension of Dataframe:

```
2
```

6.Shape of the Dataframe:

```
(3, 2)
```

8. Consider the following Dataframe “Veg”.

	RBazar	SMarket
Brinjal	40	70
Onion	30	35
Carrot	60	80
Chilly	50	65

Do the following operations:

- (1) Create the dataframe and display it
- (2) Display first two vegetables details
- (3) Display last 3 vegetable details
- (4) Change RBazar rate of Brinjal to 25
- (5) Change “RBazar” to “RaithuBazar”, “SMarket” to “SundayMarket”.

Program:

```
import pandas as pd
dict={'RBazar':[40,30,60,50],'SMarket':[70,35,80,65]}
Veg=pd.DataFrame(dict,index=['Brinjal','Onion','Carrot','Chilly'])
print("\n1.Displaying created dataframe\n",Veg)
print("\n2.First 2 vegetable details using iloc function:\n",Veg.iloc[0:2])
print("\n3.Last 3 vegetable details using tail function:\n",Veg.tail(3))
Veg.at['Brinjal','RBazar']=25
print("\n4.After modifying Brinjal Rate at Raithu Bazar to 25...\n", Veg)
Veg.rename(columns={'RBazar':'RaithuBazar','SMarket':'SundayMarket'},inplace=True)
print("\n5.After modifying Column labels...\n", Veg)
```

Output

1.Displaying created dataframe

	RBazar	SMarket
Brinjal	40	70
Onion	30	35
Carrot	60	80
Chilly	50	65

2.First 2 vegetable details using iloc function:

	RBazar	SMarket
Brinjal	40	70
Onion	30	35

3.Last 3 vegetable details using tail function:

	RBazar	SMarket
Onion	30	35
Carrot	60	80
Chilly	50	65

4.After modifying Brinjal Rate at Raithu Bazar to 25...

	RBazar	SMarket
Brinjal	25	70
Onion	30	35
Carrot	60	80
Chilly	50	65

5.After modifying Column labels...

	RaithuBazar	SundayMarket
Brinjal	25	70
Onion	30	35
Carrot	60	80
Chilly	50	65

9. Consider the following Dataframe “DF”.

	Sno	Name	Marks
First	1	Naidu	100

Second	2	Pradeep	95
Third	3	Sudeep	90

Do the following operations:

- (1) Create the dataframe DF and display it
- (2) Display Name and Marks
- (3) Change all marks to [100,100,98]
- (4) Add a new row with values [4,'Praveen',60] with row index "Fourth"
- (5) Modify row index "Third" to "NewThird"

Program:

```
import pandas as pd
dict={'SNo':[1,2,3],'Name':['Naidu','Pradeep','Sudeep'],'Marks':[100,95,90]}
DF=pd.DataFrame(dict,index=['First','Second','Third'])
print("\n1.Displaying created dataframe\n",DF)
print("\n2.Displaying columns Name and Marks \n",DF.loc[:, 'Name':'Marks'])
DF.loc[:, 'Marks']=[100,100,98]
print("\n3.After changing the Marks values \n",DF)
DF.loc['Fourth']=4,'Praveen',60
print("\n4.After adding Praveen Details\n",DF)
DF.rename(index={'Third':'NewThird'},inplace=True)
print("\n5.After modifying row index\n",DF)
```

Output

1.Displaying created dataframe

```
SNo  Name  Marks
First 1  Naidu  100
Second 2  Pradeep  95
Third 3  Sudeep  90
```

2.Displaying columns Name and Marks

```
Name  Marks
First  Naidu  100
Second Pradeep  95
Third  Sudeep  90
```

3.After changing the Marks values

```
SNo  Name  Marks
First 1  Naidu  100
Second 2  Pradeep  100
Third 3  Sudeep  98
```

4.After adding Praveen Details

```
SNo  Name  Marks
First 1  Naidu  100
Second 2  Pradeep  100
Third 3  Sudeep  98
Fourth 4  Praveen  60
```

5.After modifying row index

```
SNo  Name  Marks
First 1  Naidu  100
Second 2  Pradeep  100
```

NewThird 3 Sudeep 98
Fourth 4 Praveen 60

10. Consider the following Dataframe “DF”.

	Sno	Name	Marks
First	1	Naidu	100
Second	2	Pradeep	95
Third	3	Sudeep	90

Do the following operations:

- (1) Create the dataframe DF and display it
- (2) Display row with index “Third”
- (3) Modify the details with row index “Second” to [20,”Manohar”,80]
- (4) Change Column Index “Name” to “StudentName”
- (5) Delete the row with index “Third”

PROGRAM:

```
import pandas as pd
dict={'SNo':[1,2,3],'Name':['Naidu','Pradeep','Sudeep'],'Marks':[100,95,90]}
DF=pd.DataFrame(dict,index=['First','Second','Third'])
print("\n1.Displaying created dataframe\n",DF)
print("\n2.Displaying row with index Third \n",DF.loc['Third'])
DF.loc['Second']=[20,'Manohar',80]
print("\n3.After Modifying values of row with index Second \n",DF)
DF=DF.rename(columns={'Name':'StudentName'})
print("\n4.After renaming column heading \n",DF)
DF.drop('Third',axis=0,inplace=True)
print("\n5.After deleting a row \n",DF)
```

OUTPUT

1.Displaying created dataframe

```
      SNo  Name Marks
First   1  Naidu  100
Second  2  Pradeep  95
Third   3  Sudeep   90
```

2.Displaying row with index Third

```
      SNo
Name   Sudeep
Marks    90
Name: Third, dtype: object
```

3.After Modifying values of row with index Second

```
      SNo  Name Marks
First   1  Naidu  100
Second 20  Manohar  80
Third   3  Sudeep   90
```

4.After renaming column heading

```
      SNo StudentName Marks
First   1     Naidu  100
Second 20     Manohar   80
Third   3     Sudeep   90
```

5.After deleting a row

SNo StudentName Marks
 First 1 Naidu 100
 Second 20 Manohar 80

11. Consider the following Dataframe “DF”.

	Sno	Name	Marks
First	1	Naidu	100
Second	2	Pradeep	95
Third	3	Sudeep	90

Do the following operations:

- (1) Create the dataframe DF and display it
- (2) Display following output


```
Name Marks
Second Pradeep 95
Third Sudeep 90
```
- (3) Change Sudeep Marks to 98
- (4) Add a column ‘BGroup’ with details [‘B+’,’AB’,’B+’]
- (5) Delete the column marks

PROGRAM:

```
import pandas as pd
dict={'SNo':[1,2,3],'Name':['Naidu','Pradeep','Sudeep'],'Marks':[100,95,90]}
DF=pd.DataFrame(dict,index=['First','Second','Third'])
print("\n1.Displaying created dataframe\n",DF)
print("\n2.Displaying the given output \n",DF.loc['Second':'Third','Name':'Marks'])
DF.loc['Third','Marks']=98
print("\n3.After Modifying Sudeep Marks \n",DF)
DF.loc[:,'BGroup']=['B+','AB','B+']
print("\n4.After adding a new column \n",DF)
DF.drop('Marks',axis=1,inplace=True)
print("\n5.After deleting a column \n",DF)
```

OUTPUT

1.Displaying created dataframe

```
SNo Name Marks
First 1 Naidu 100
Second 2 Pradeep 95
Third 3 Sudeep 90
```

2.Displaying the given output

```
Name Marks
Second Pradeep 95
Third Sudeep 90
```

3.After Modifying Sudeep Marks

```
SNo Name Marks
First 1 Naidu 100
Second 2 Pradeep 95
Third 3 Sudeep 98
```

4.After adding a new column

```
SNo Name Marks BGroup
First 1 Naidu 100 B+
Second 2 Pradeep 95 AB
```

Third 3 Sudeep 98 B+

5. After deleting a column

SNo Name BGroup
First 1 Naidu B+
Second 2 Pradeep AB
Third 3 Sudeep B+

12. Write a program which iterates rows in a dataframe. (iterrows)

Given Data:

	Teachers	Students
Private	30	200
Govt	20	150

Program:

```
import pandas as pd
dict={'Teachers':[30,20],'Students':[200,150]}
DF=pd.DataFrame(dict,index=['Private','Govt'])
print("Original Dataframe \n",DF)
print("\nIterating rows over Dataframe:")
for (row,rowSeries) in DF.iterrows():
    print("\nRow index:",row)
    print(rowSeries)
```

Output

```
Original Dataframe
   Teachers  Students
Private    30      200
Govt       20      150
```

Iterating rows over Dataframe:

```
Row index: Private
Teachers    30
Students   200
Name: Private, dtype: int64
```

```
Row index: Govt
Teachers    20
Students   150
Name: Govt, dtype: int64
```

13. Write a program which iterates columns in a dataframe.

Given Data:

	Teachers	Students
Private	30	200
Govt	20	150

Program:

```
import pandas as pd
dict={'Teachers':[30,20],'Students':[200,150]}
DF=pd.DataFrame(dict,index=['Private','Govt'])
print("Original Dataframe \n",DF)
print("\nIterating columns over Dataframe:")
for (col,colSeries) in DF.iteritems(): #(or) in DF.items() in new version of python
    print("\nColumn index:",col)
    print(colSeries)
```

Output

```
Original Dataframe
```

Teachers Students
 Private 30 200
 Govt 20 150
 Iterating columns over Dataframe:

Column index: Teachers
 Private 30
 Govt 20
 Name: Teachers, dtype: int64

Column index: Students
 Private 200
 Govt 150
 Name: Students, dtype: int64

14. Write a program to export a dataframe to a CSV file, again import the same CSV file to a dataframe.

Given Data:

	RNo	Name	Marks
Sec A	15	Srinidhi	98
Sec B	7	Ratan	99
Sec C	5	Maheswari	97

File Address: D:/toppers.csv

Program:

```
import pandas as pd
dict={'RNo':[15,7,5],'Name':['Srinidhi','Ratan','Maheswari'],'Marks':[98,99,97]}
DF=pd.DataFrame(dict,index=['Sec A','Sec B','Sec C'])
print("Printing Created Dataframe \n",DF)
DF.to_csv("D:/toppers.csv")
ImpDF=pd.read_csv("D:/toppers.csv")
print("\nPrinting Imported Dataframe from a CSV File \n",ImpDF)
```

Output

Printing Created Dataframe

	RNo	Name	Marks
Sec A	15	Srinidhi	98
Sec B	7	Ratan	99
Sec C	5	Maheswari	97

Printing Imported Dataframe from a CSV File

Unnamed: 0	RNo	Name	Marks	
0	Sec A	15	Srinidhi	98
1	Sec B	7	Ratan	99
2	Sec C	5	Maheswari	97

15. Write a program to export a dataframe to a CSV file, then import first 2 records from the same CSV file to a dataframe.

Given Data:

	SMarket	RBazar
Brinjal	50	35
Potato	45	30
Onion	30	25

File Name (should store in python location only) "Vegetables.csv"

Program:

```

import pandas as pd
dict={'SMarket':[50,45,30],'RBazar':[35,30,25]}
DF=pd.DataFrame(dict,index=['Brinjal', 'Potato','Onion'])
print("Printing Created Dataframe \n",DF)
DF.to_csv("Vegetables.csv")
print("Dataframe DF is exported to CSV File \n")
ImpDF=pd.read_csv("Vegetables.csv",nrows=2)
print("\nPrinting Imported Dataframe from a CSV File")
print(ImpDF)

```

Output

Printing Created Dataframe

	SMarket	RBazar
Brinjal	50	35
Potato	45	30
Onion	30	25

Dataframe DF is exported to CSV File

Printing Imported Dataframe from a CSV File

	Unnamed: 0	SMarket	RBazar
0	Brinjal	50	35
1	Potato	45	30

16. Write a program for given the school result data, analyse the performance of the students subject wise, plot using bar chart.

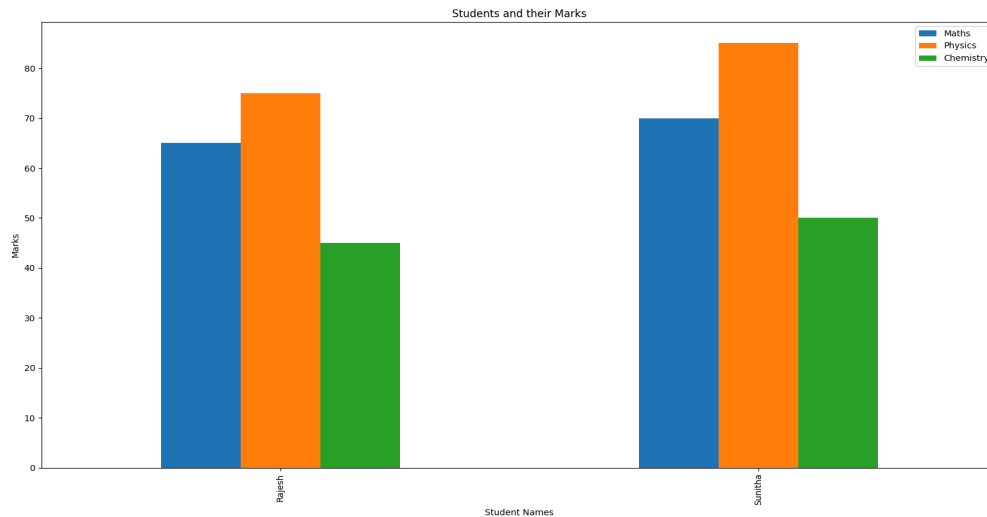
Given Dataframe:

	Maths	Physics	Chemistry
Rajesh	65	75	45
Sunitha	70	85	50

```

import matplotlib.pyplot as plt
import pandas as pd
marks = { "Maths":[65,70],"Physics":[75,85],"Chemistry" :[45,50]}
df = pd.DataFrame(marks, index=['Rajesh','Sunitha'])
print(df)
df.plot(kind='bar')
plt.title("Students and their Marks")
plt.xlabel("Student Names")
plt.ylabel("Marks")
plt.savefig('D:/marks.pdf')
plt.show()

```



17. Write a program to compare rates of vegetables in Raithubazar and Sunday Market using line charts.

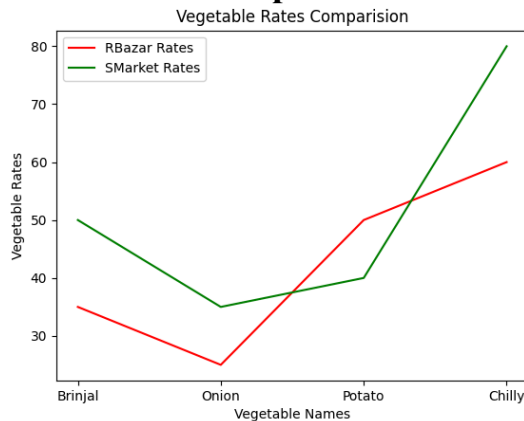
Given Data:

	RBazar	SMarket
Brinjal	35	50
Onion	25	35
Potato	50	40
Chilly	60	80

Program:

```
import matplotlib.pyplot as plt
Veg=["Brinjal","Onion","Potato","Chilly"]
RBazar=[35,25,50,60]
SMarket=[50,35,40,80]
plt.plot(Veg, RBazar, color='r', label='RBazar Rates')
plt.plot(Veg, SMarket, color='g', label='SMarket Rates')
plt.xlabel("Vegetable Names")
plt.ylabel("Vegetable Rates")
plt.title("Vegetable Rates Comparision")
plt.legend()
plt.savefig('D:/rates.jpg')
plt.show()
```

Output



18. Rakesh went to Vegetables shop to purchase vegetables. Write a program to display him vegetable names and its rates per KG using a bar chart (Give different colour to each bar).

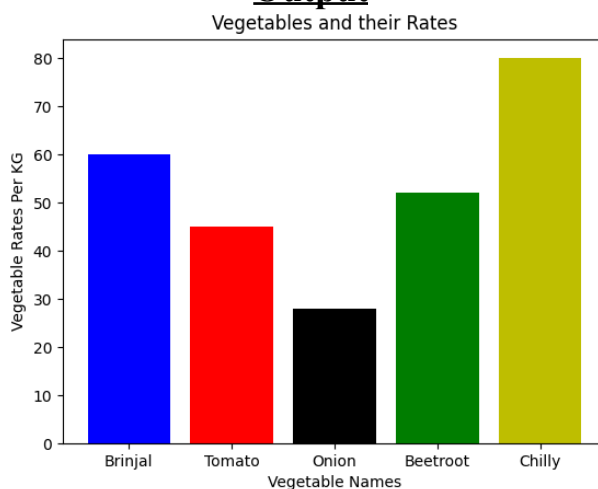
Given Data:

Vegetable names are Brinjal, Tomato, Onion, Beetroot, Chilly
 Their Corresponding Rates are 60,45,28,52,80.

Program:

```
import matplotlib.pyplot as pp
vegetables=['Brinjal','Tomato','Onion','Beetroot','Chilly']
rates=[60,45,28,52,80]
pp.title ("Vegetables and their Rates")
pp.xlabel("Vegetable Names")
pp.ylabel("Vegetable Rates Per KG")
pp.bar(vegetables,rates,color=['b','red','k','g','y'])
pp.savefig('D:/veg.jpg')
pp.show()
```

Output



19. Plot the following data on line chart and customize chart according to below given instructions.

Month	January	February	March	April	May
Sales	500	350	450	550	600

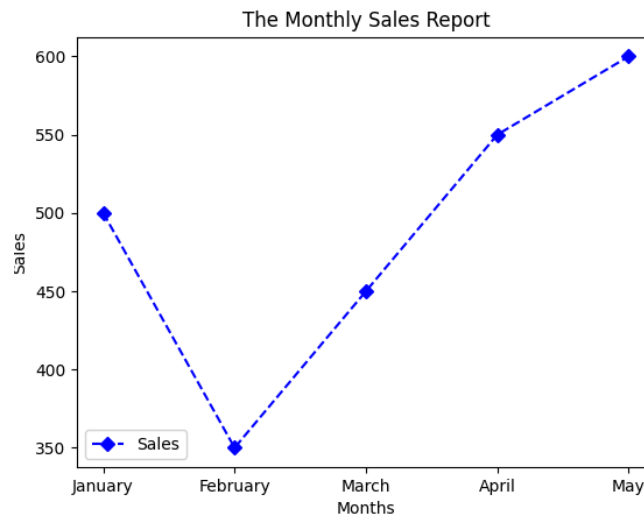
Write a program which includes all the following:

- (a) Write a title for the chart ‘The Monthly Sales Report’
- (b) Write titles “Months” and “Sales” for X-axis and Y-axis
- (c) Write code to display legend at lower left corner
- (d) Display blue colour for the line
- (e) Use line style-dashed
- (f) Display diamond style markers on data points.

Program:

```
import matplotlib.pyplot as pt
months=['January','February','March','April','May']
sales=[500,350,450,550,600]
pt.plot(months,sales,label='Sales',color='b', linestyle='dashed',marker='D')
pt.title("The Monthly Sales Report")
pt.xlabel("Months")
pt.ylabel("Sales")
pt.legend(loc='lower left')
pt.savefig('D:/monthliesales.jpg')
```

pt.show()



20. Plot the following ages details of 20 students using Histogram.

X=[16,15,14,18,17,16,14,16,15,18,15,16,18,14,16,15,14,16,17,14]

Program:

```
import matplotlib.pyplot as pl
```

```
X=[16,15,14,18,17,16,14,16,15,18,15,16,18,14,16,15,14,16,17,14]
```

```
pl.hist(X,ec='red')
```

```
pl.title("Histogram showing Countwise Ages in a Inter College of 20 students")
```

```
pl.xlabel("Ages")
```

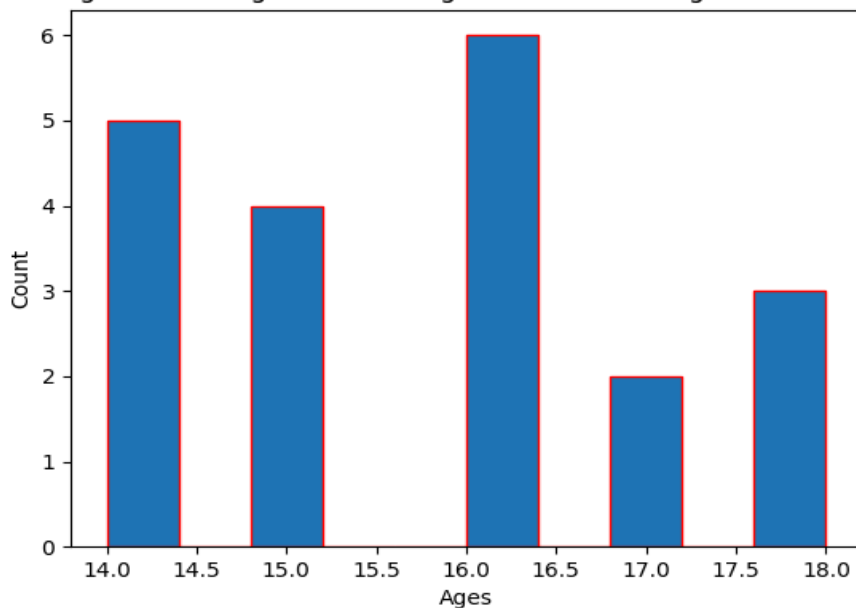
```
pl.ylabel("Count")
```

```
pl.savefig('D:/ageshistogram.pdf')
```

```
pl.show()
```

Output

Histogram showing Countwise Ages in a Inter College of 20 students



SQL RECORD PROGRAMS : 21 to 23

21. Consider the following table “Student”. Write SQL Queries for the following:

- (i) Create a student table with the student id, name, and marks as attributes where the student id is the primary key.
- (ii) Insert the following details in the student table.

STUDENTID	NAME	MARKS
W1001	Rajesh	95
W1002	Naveen	85
W1003	Naresh	50
W1004	Sunitha	100
W1005	Lakshmi	55

- (iii) Use the select command to get the details of the students with **marks more than 80**.
- (iv) To display (student ID, marks) details of the table in **descending order** of the marks.
- (v) To Display Name and Marks of the students whose **name starts with "N"**
- (vi) To modify Lakshmi Marks to 90
- (vii) Delete the details of student with studentid-W1003 in the above table.
- (viii) To insert a new row with details [W1006,Anand,80]

Write Outputs on the original given data:

- (ix) SELECT LCASE(NAME) FROM STUDENT WHERE MARKS>75;
(To display the student names in **lower case letters**, whose **marks are more than 75**)
- (x) SELECT NAME, LENGTH(NAME) FROM STUDENT;
(To display student name, along with its **length** (count of number of characters))
- (xi) SELECT NAME, INSTR(NAME,"a") FROM STUDENT;
(To display student name, along with position of character "a" in name)
- (xii) SELECT STUDENTID,NAME,LEFT(NAME,3) FROM STUDENT;
(To display student id, Name and first three characters of the name)
- (xiii) SELECT MIN(MARKS),MAX(MARKS),SUM(MARKS),AVG(MARKS),COUNT(NAME),COUNT(*) FROM STUDENT;
(To display **min, max, sum, and average** of the marks, count of names, count of rows in student table.)
- (xiv) SELECT NAME, SUBSTR(NAME,2,3) FROM STUDENT;
(To display name, 2nd character onwards 3 characters from Name)

Answers:

- (i) CREATE TABLE STUDENT(STUDENTID VARCHAR(5) PRIMARY KEY,NAME VARCHAR(30),MARKS FLOAT);

Output:

```
mysql> DESC STUDENT;
```

Field	Type	Null	Key	Default	Extra
STUDENTID	varchar(5)	NO	PRI	NULL	
NAME	varchar(30)	YES		NULL	
MARKS	float	YES		NULL	

- (ii) INSERT INTO STUDENT VALUES('W1001','Rajesh',95),('W1002','Naveen',85), ('W1003','Naresh',50), ('W1004','Sunitha',100),('W1005','Lakshmi',55');

Output:

```
mysql> SELECT * FROM STUDENT;
```

STUDENTID	NAME	MARKS
W1001	Rajesh	95
W1002	Naveen	85
W1003	Naresh	50
W1004	Sunitha	100
W1005	Lakshmi	55

- (iii) SELECT * FROM STUDENT WHERE MARKS>80;

Output:

STUDENTID	NAME	MARKS
W1001	Rajesh	95
W1002	Naveen	85
W1004	Sunitha	100

- (iv) SELECT STUDENTID, MARKS FROM STUDENT ORDER BY MARKS DESC;

Output:

STUDENTID	MARKS
W1004	100
W1001	95
W1002	85
W1005	55
W1003	50

(v) SELECT NAME,MARKS FROM STUDENT WHERE NAME LIKE "N%";

Output:

NAME	MARKS
Naveen	85
Naresh	50

(vii) UPDATE STUDENT SET MARKS=90 WHERE NAME='LAKSHMI';

Output:

```
mysql> SELECT * FROM STUDENT;
```

STUDENTID	NAME	MARKS
W1001	Rajesh	95
W1002	Naveen	85
W1003	Naresh	50
W1004	Sunitha	100
W1005	Lakshmi	90

(vii) DELETE FROM STUDENT WHERE STUDENTID='W1003';

Output:

```
mysql> SELECT * FROM STUDENT;
```

STUDENTID	NAME	MARKS
W1001	Rajesh	95
W1002	Naveen	85
W1004	Sunitha	100
W1005	Lakshmi	90

(viii) INSERT INTO STUDENT VALUES('W1006','Anand',80);

Output:

STUDENTID	NAME	MARKS
W1001	Rajesh	95
W1002	Naveen	85
W1004	Sunitha	100
W1005	Lakshmi	90
W1006	Anand	80

Outputs:

(ix)

LCASE(NAME)
rajesh
naveen
sunitha

(x)

NAME	LENGTH(NAME)
Rajesh	6
Naveen	6
Naresh	6
Sunitha	7
Lakshmi	7

(xi)

NAME	INSTR(NAME, "a")
Rajesh	2
Naveen	2
Naresh	2
Sunitha	7
Lakshmi	2

(xii)

STUDENTID	NAME	LEFT(NAME, 3)
W1001	Rajesh	Raj
W1002	Naveen	Nav
W1003	Naresh	Nar
W1004	Sunitha	Sun
W1005	Lakshmi	Lak

(xiii)

MIN(MARKS)	MAX(MARKS)	SUM(MARKS)	AVG(MARKS)	COUNT(NAME)	COUNT(*)
50	100	385	77	5	5

(xiv)

NAME	SUBSTR(NAME, 2, 3)
Rajesh	aje
Naveen	ave
Naresh	are
Sunitha	uni
Lakshmi	aks

22. Consider the following table “Customers”. Write SQL Queries for the following:

- (i) Create customers table with the customer ID, customer Name, country as attributes where customer id is the primary key.
(ii) Insert the following details in the customers table.

CUSTOMER ID	CUSTOMERNAME	COUNTRY
C1001	Suresh	India
C1002	Mohan	USA
C1003	Lakshmi	India
C1004	Srujana	Srilanka
C1005	Rahul	USA

- (iii) To display CustomerID and CustomerName in ascending order of CustomerName.
(iv) To Display the details of the customers whose country name ends with “IA”
(v) To change the Country of Mohan to Africa.
(vi) Find the total number of customers from each country in the table using group by.
(vii) Delete the entire customers table including structure.

Write Outputs on the original given data:

- (viii) SELECT CUSTOMERNAME, LEFT(CUSTOMERNAME,3),RIGHT(COUNTRY,2) FROM CUSTOMERS;
(To display CustomerName,first 3 characters from CustomerName and last 3 characters from Country.)
(ix) SELECT UCASE(CUSTOMERNAME), LCASE(COUNTRY) FROM CUSTOMERS;
(To display the cutomernames in upper case letters and Country names in lower case letters.)
(x) SELECT CUSTOMERNAME,LEFT(MID(CUSTOMERNAME,2,4),2) FROM CUSTOMERS;
(xi) SELECT COUNTRY, LENGTH(COUNTRY) FROM CUSTOMERS;
(To display Country Name along with count of characters in country name)

ANSWERS:

- (i) CREATE TABLE CUSTOMERS(CUSTOMERID VARCHAR(5) PRIMARY KEY, CUSTOMERNAME VARCHAR(30),COUNTRY VARCHAR(15));

Output:

```
mysql> DESC CUSTOMERS;
```

Field	Type	Null	Key	Default	Extra
CUSTOMERID	varchar(5)	NO	PRI	NULL	
CUSTOMERNAME	varchar(30)	YES		NULL	
COUNTRY	varchar(15)	YES		NULL	

(ii) INSERT INTO CUSTOMERS VALUES('C1001','Suresh','India'),('C1002','Mohan','USA'),
('C1003','Lakshmi','India'),('C1004','Srujana','Srilanka'),('C1005','Rahul','USA');

Output:

```
mysql> SELECT * FROM CUSTOMERS;
```

CUSTOMERID	CUSTOMERNAME	COUNTRY
C1001	Suresh	India
C1002	Mohan	USA
C1003	Lakshmi	India
C1004	Srujana	Srilanka
C1005	Rahul	USA

(iii) SELECT CUSTOMERID,CUSTOMERNAME FROM CUSTOMERS ORDER BY CUSTOMERNAME ASC;

Output:

CUSTOMERID	CUSTOMERNAME
C1003	Lakshmi
C1002	Mohan
C1005	Rahul
C1004	Srujana
C1001	Suresh

(iv) SELECT * FROM CUSTOMERS WHERE COUNTRY LIKE "%ia";

Output:

CUSTOMERID	CUSTOMERNAME	COUNTRY
C1001	Suresh	India
C1003	Lakshmi	India

(v) UPDATE CUSTOMERS SET COUNTRY="AFRICA" WHERE CUSTOMERNAME="MOHAN";

Output:

```
mysql> SELECT * FROM CUSTOMERS;
```

CUSTOMERID	CUSTOMERNAME	COUNTRY
C1001	Suresh	India
C1002	Mohan	AFRICA
C1003	Lakshmi	India
C1004	Srujana	Srilanka
C1005	Rahul	USA

(vi) SELECT COUNTRY, COUNT(*) FROM CUSTOMERS GROUP BY COUNTRY;

Output:

COUNTRY	COUNT(*)
India	2
Srilanka	1
USA	2

(vii) DROP TABLE CUSTOMERS;

Output:

```
mysql> SELECT * FROM CUSTOMERS;
ERROR 1146 (42S02): Table 'mrkxii.customers' doesn't exist
```

(viii)

CUSTOMERNAME	LEFT(CUSTOMERNAME,3)	RIGHT(COUNTRY,2)
Suresh	Sur	ia
Mohan	Moh	SA
Lakshmi	Lak	ia
Srujana	Sru	ka
Rahul	Rah	SA

(ix)

UCASE(CUSTOMERNAME)	LCASE(COUNTRY)
SURESH	india
MOHAN	usa
LAKSHMI	india
SRUJANA	srilanka
RAHUL	usa

(x)

CUSTOMERNAME	LEFT(MID(CUSTOMERNAME,2,4),2)
Suresh	ur
Mohan	oh
Lakshmi	ak
Srujana	ru
Rahul	ah

(xi)

COUNTRY	LENGTH(COUNTRY)
India	5
USA	3
India	5
Srilanka	8
USA	3

23. Consider the following table “Faculty”.

SNo	Name	Subject	DOJ	Salary
1	Naveen Babu	IP	2019-12-25	65759
2	Suman Suresh	ICT	2015-10-18	53460
3	Swathi Latha	AI	2020-05-10	62724
4	Gayathri Kumari	IP	2020-03-15	45690

Write SQL Queries for the following:

- (i) To create the above table.
- (ii) To make SNo as Primary Key
- (iii) To insert the above values in to the table.
- (iv) To get the number of count to each character in every name;
- (v) To display the name of the person who have joined recently;
- (vi) To display the name of the month joined by Naveen Babu
- (vii) To count the number of persons who are teaching subject IP
- (viii) To display the total salary of all the employees;
- (ix) To display the name of the person who is teaching subject IP and getting more salary.
- (x) To display names of the faculty along with their year of joining.
- (xi) To display Name,DOJ and their joining month name.

Write outputs for the following SQL Queries:

- (xii) SELECT NAME,POWER(SNO,3) FROM FACULTY;
- (xiii) SELECT NAME,SALARY,ROUND(SALARY,-2) FROM FACULTY;
- (xiv) SELECT MOD(SALARY,SNO) FROM FACULTY;

(xv) SELECT MID(RIGHT(NAME,4),2) FROM FACULTY;

(xvi) SELECT INSTR(NAME,'A') FROM FACULTY;

ANSWERS:

(i) CREATE TABLE FACULTY(SNO INT,NAME VARCHAR(20),SUBJECT VARCHAR(10),DOJ DATE,SALARY INT);

Output:

```
mysql> DESC FACULTY;
```

Field	Type	Null	Key	Default	Extra
SNO	int(11)	YES		NULL	
NAME	varchar(20)	YES		NULL	
SUBJECT	varchar(10)	YES		NULL	
DOJ	date	YES		NULL	
SALARY	int(11)	YES		NULL	

(ii) ALTER TABLE FACULTY ADD PRIMARY KEY(SNO);

Output:

```
mysql> DESC FACULTY;
```

Field	Type	Null	Key	Default	Extra
SNO	int(11)	NO	PRI	0	
NAME	varchar(20)	YES		NULL	
SUBJECT	varchar(10)	YES		NULL	
DOJ	date	YES		NULL	
SALARY	int(11)	YES		NULL	

(iii) INSERT INTO FACULTY VALUES(1,'Naveen Babu','IP','2019-12-25',65759),(2,'Suman Suresh','ICT','2015-10-18',53460),(3,'Swathi Latha','AI','2020-05-10',62724),(4,'Gayathri Kumari','IP','2020-03-15',45690);

Output:

```
mysql> SELECT * FROM FACULTY;
```

SNO	NAME	SUBJECT	DOJ	SALARY
1	Naveen Babu	IP	2019-12-25	65759
2	Suman Suresh	ICT	2015-10-18	53460
3	Swathi Latha	AI	2020-05-10	62724
4	Gayathri Kumari	IP	2020-03-15	45690

(iv) SELECT NAME, LENGTH(NAME) FROM FACULTY;

Output:

NAME	LENGTH(NAME)
Naveen Babu	11
Suman Suresh	12
Swathi Latha	12
Gayathri Kumari	15

(v) SELECT NAME FROM FACULTY WHERE DOJ=(SELECT MAX(DOJ) FROM FACULTY);

Output:

NAME
Swathi Latha

(vi) SELECT MONTHNAME(DOJ) FROM FACULTY WHERE NAME='Naveen Babu';

Output:

MONTHNAME(DOJ)
December

(vii) SELECT SUBJECT,COUNT(*) FROM FACULTY GROUP BY SUBJECT HAVING SUBJECT='IP';

Output:

SUBJECT	COUNT(*)
IP	2

(OR)

SELECT SUBJECT,COUNT(SUBJECT) FROM FACULTY WHERE SUBJECT='IP';

SUBJECT	COUNT(SUBJECT)
IP	2

(viii) SELECT SUM(SALARY) AS "TOTAL SALARY OF ALL EMPLOYEES" FROM FACULTY;

Output:

TOTAL SALARY OF ALL EMPLOYEES
227633

(ix) SELECT NAME FROM FACULTY WHERE SUBJECT='IP' AND SALARY=(SELECT MAX(SALARY) FROM FACULTY);

Output:

NAME
Naveen Babu

(x) SELECT NAME, YEAR(DOJ) FROM FACULTY;

Output:

NAME	YEAR(DOJ)
Naveen Babu	2019
Suman Suresh	2015
Swathi Latha	2020
Gayathri Kumari	2020

(xi) SELECT NAME,DOJ, MONTHNAME(DOJ) FROM FACULTY;

NAME	DOJ	MONTHNAME(DOJ)
Naveen Babu	2019-12-25	December
Suman Suresh	2015-10-18	October
Swathi Latha	2020-05-10	May
Gayathri Kumari	2020-03-15	March

OUTPUT

(xii)

NAME	POWER(SNO,3)
Naveen Babu	1
Suman Suresh	8
Swathi Latha	27
Gayathri Kumari	64

(xiii)

NAME	SALARY	ROUND(SALARY,-2)
Naveen Babu	65759	65800
Suman Suresh	53460	53500
Swathi Latha	62724	62700
Gayathri Kumari	45690	45700

(xiv)

```
MOD(SALARY, SNO)
0
0
0
2
```

(xv)

```
MID(RIGHT(NAME, 4), 2)
abu
esh
tha
ari
```

(xiv)

```
INSTR(NAME, 'A')
2
4
3
2
```