Experiment 1

Aim- working with formulas and function

Basic formulas

1. SUM

The SUM() formula performs addition on selected cells. It works on cells containing numerical values and requires two or more cells.

```
=SUM(C2:C5)
```

MIN and MAX

The MIN() formula requires a range of cells, and it returns the minimum value.

```
=MIN(E2:E5)
```

AVERAGE

The AVERAGE() formula calculates the average of selected cells.

```
=AVERAGE(C2:C5)
```

COUNT

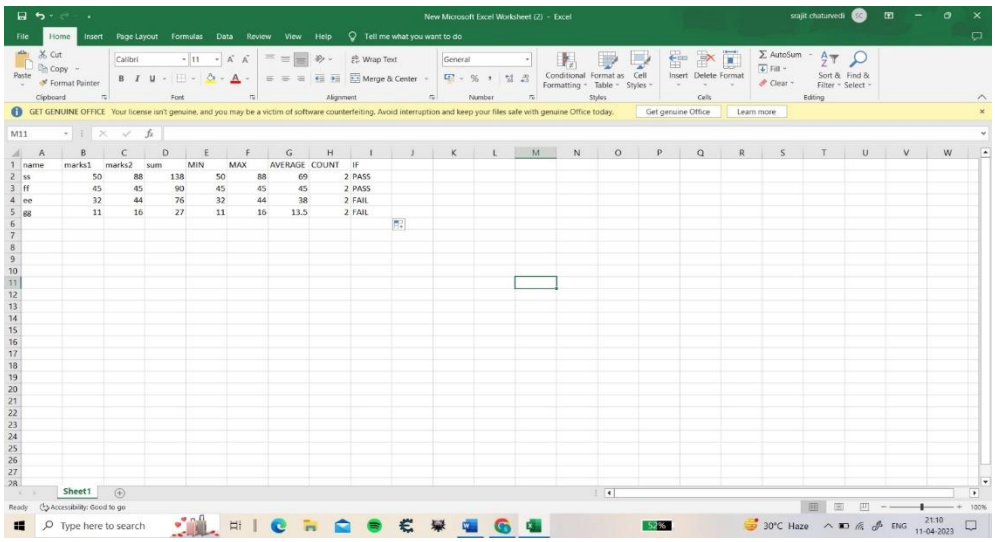
The COUNT() formula counts the total number of selected cells. It will not count the blank cells and different data formats other than numeric.

```
=COUNT(E2:E5)
```

IF

The IF Excel formula is straightforward. It is similar to an if-else statement in a programming language. We will provide the logic of the formula. If the logic is correct, it will return a certain value; if the logic is False, it will return a different value.

```
=IF(G2<24.9,"Fit,"Unfit")
```



name	marks1	marks2	sum	MIN	MAX	AVERAGE	COUNT	IF
ss	50	88	138	50	88	69	2	PASS
ff	45	45	90	45	45	45	2	PASS
ee	32	44	76	32	44	38	2	FAIL
gg	11	16	27	11	16	13.5	2	FAIL

Result- we were able to perform basic operations in

Experiment2

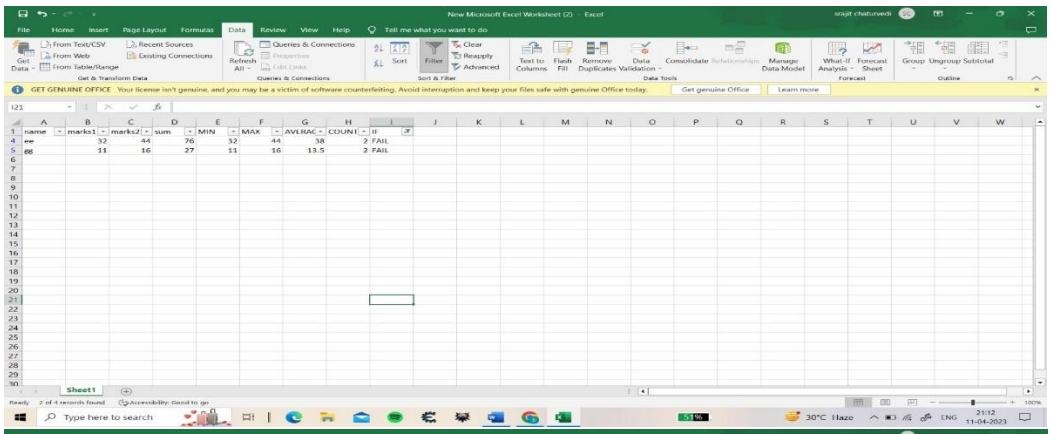
Aim – working with filter and piovat table

Filter

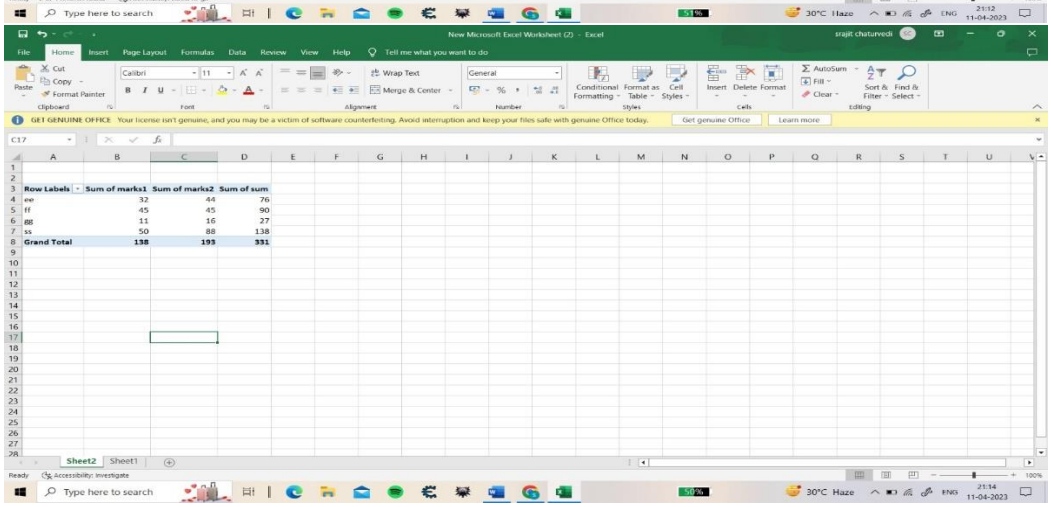
1. Click a cell in the range or table that you want to filter.
2. On the Data tab, click Filter.
3. Click the arrow. in the column that contains the content that you want to filter.
4. Under Filter, click Choose One, and then enter your filter criteria.

Pivot table

1. Select the cells you want to create a PivotTable from. ...
2. Select Insert > PivotTable.
3. This will create a PivotTable based on an existing table or range. ...
4. Choose where you want the PivotTable report to be placed. ...
5. Click OK.



name	marks1	marks2	sum	MIN	MAX	AVERAGE	COUNT	if
ee	32	44	76	32	44	38	2	FAIL
gg	11	16	27	11	16	13.5	2	FAIL



Row Labels	Sum of marks1	Sum of marks2	Sum of sum
ee	32	44	76
ff	45	45	90
gg	11	16	27
ss	50	88	138
Grand Total	138	193	331

Result- we are able to perform filter and pivot table

Experiment 3

Aim – chats using excel (bar chart ,pie chart ,scatter plot)

Barchart

Steps-

Select the range

On the Insert tab, in the Charts group, click the Column symbol.

Click Clustered Bar.

Pie chart

Steps to –

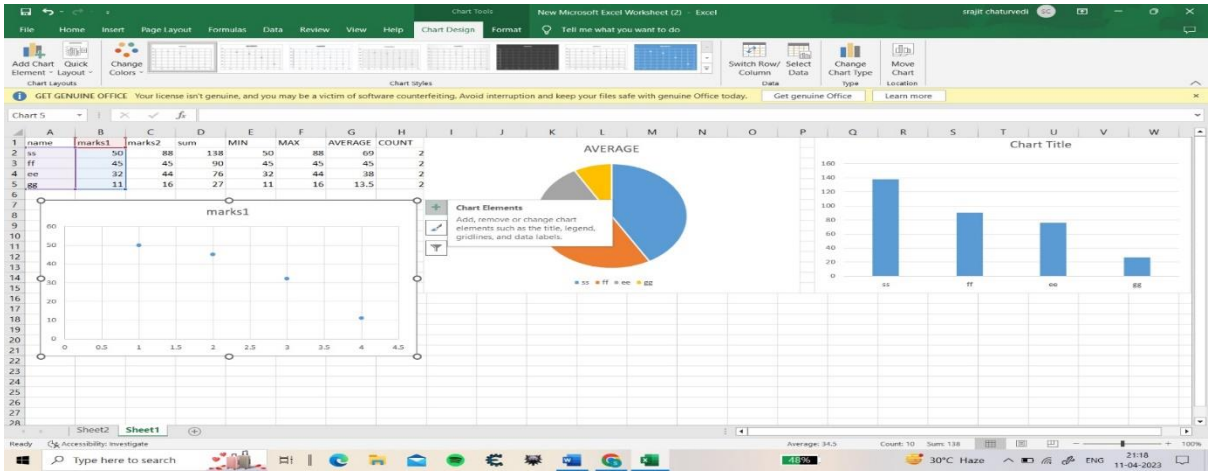
1. Click Insert > Chart. ...
2. Click Pie and then double-click the pie chart you want.
3. In the spreadsheet that appears, replace the placeholder data with your own information. ...
4. When you've finished, close the spreadsheet.
5. Click the chart and then click the icons next to the chart to add finishing touches:

Scatter plot

Steps-

Choose your independent and dependent variables

Click the Insert tab, and then click Insert Scatter (X, Y) or Bubble Chart.
Click Scatter.



Result- we were able to perform the charts successfully

Experiment 4

Aim- demonstrate the histrogram and descriptive stastics

Histrogram

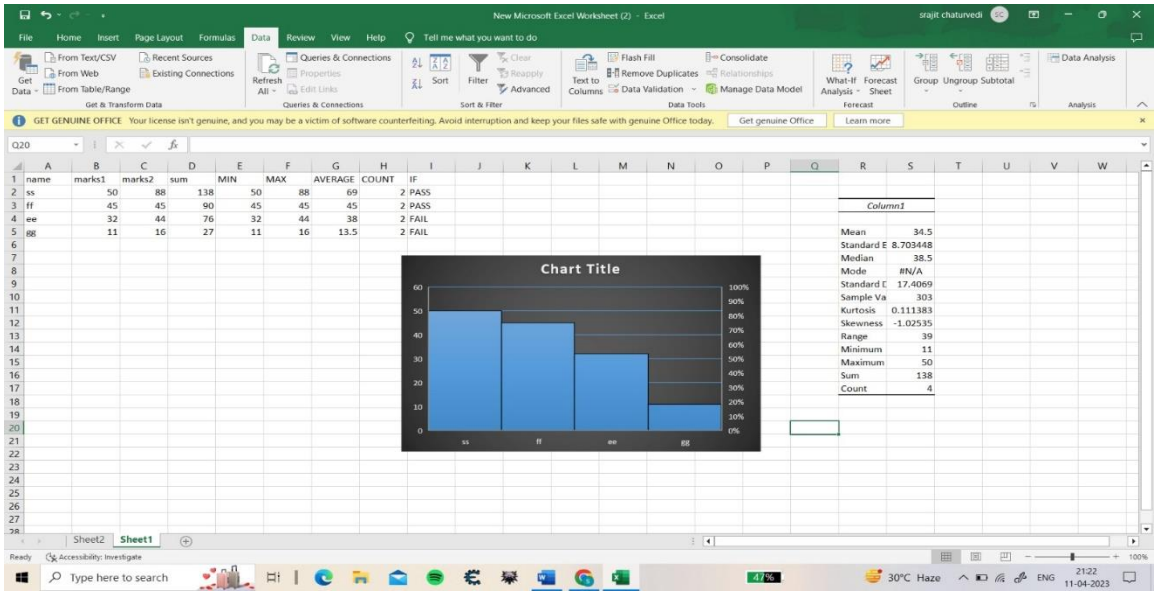
Steps-

1. Make sure you load the Analysis ToolPakto add the **Data Analysis** command to the **Data** tab.
2. On a worksheet, type the input data in one column, and the bin numbers in ascending order in another column.
3. Click **Data** > **Data Analysis** > **Histogram** > **OK.**
4. Under **Input,** select the input range (your data), then select the bin range.
5. Under **Output options,** choose an output location.
6. To show the data in descending order of frequency, click **Pareto (sorted histogram).**
7. To show cumulative percentages and add a cumulative percentage line, click **Cumulative Percentage.**
8. To show an embedded histogram chart, click **Chart Output.**

Descriptive Statistics

Steps-

1. On the Data tab, in the Analysis group, click Data Analysis. Note: can't find the Data Analysis button? ...
2. Select Descriptive Statistics and click OK.
3. Select the range A2:A15 as the Input Range.
4. Select cell C1 as the Output Range.
5. Make sure Summary statistics is checked.
6. Click OK.



Result-we were able to perform the the operation sucessfully

Experiment 5

Aim- exponential smoothing and moving average

Moving average

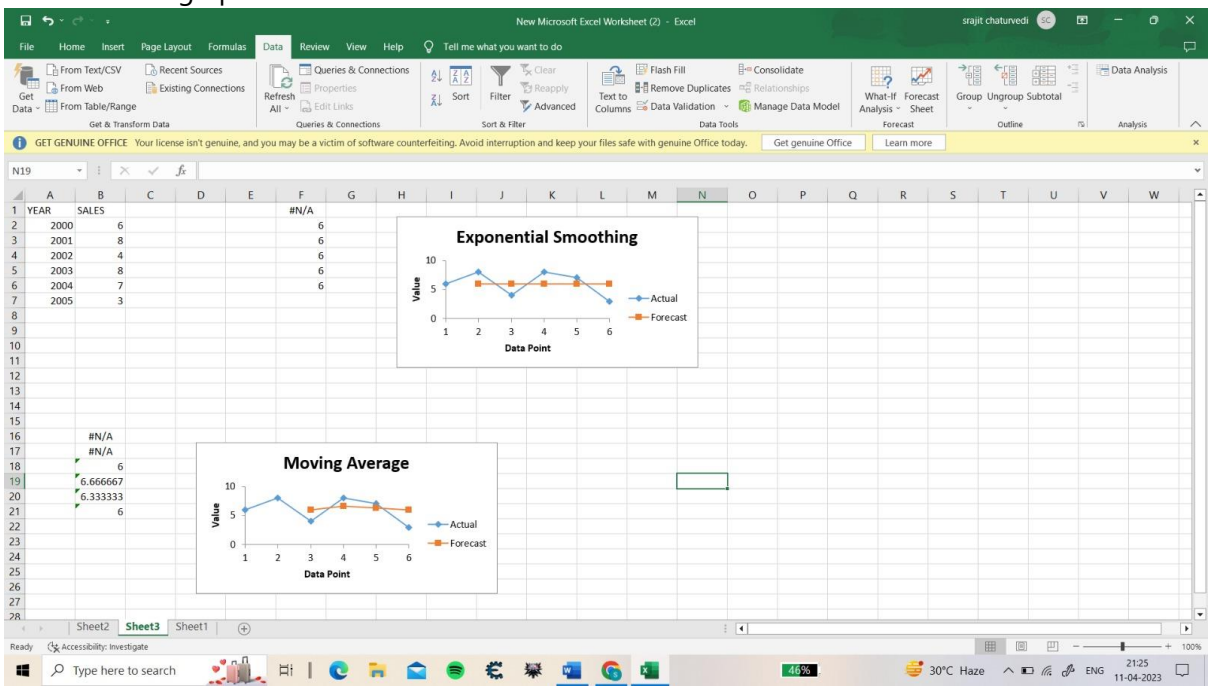
Steps

1. Create a time series in Excel. A time series is a data point series arranged according to a time order. ...
2. Select "Data Analysis" ...
3. Choose "Moving Average" ...
4. Select your interval, input and output ranges. ...
5. Create a graph using the values.

Exponential smoothing

Steps

1. We must first click on the “Data” tab and “Data Analysis.
2. After that, select the “Exponential Smoothing” option
3. Click in the Input Range box and select the range
4. Click in the Damping factor box
5. Click in the Output Range box
6. Click OK.
7. Plot a graph of these values.



Result-we were able to perform the the operation successfully

Experiment 6

Aim-introduction to numpy and implementing array using numpy in python

Numpy-

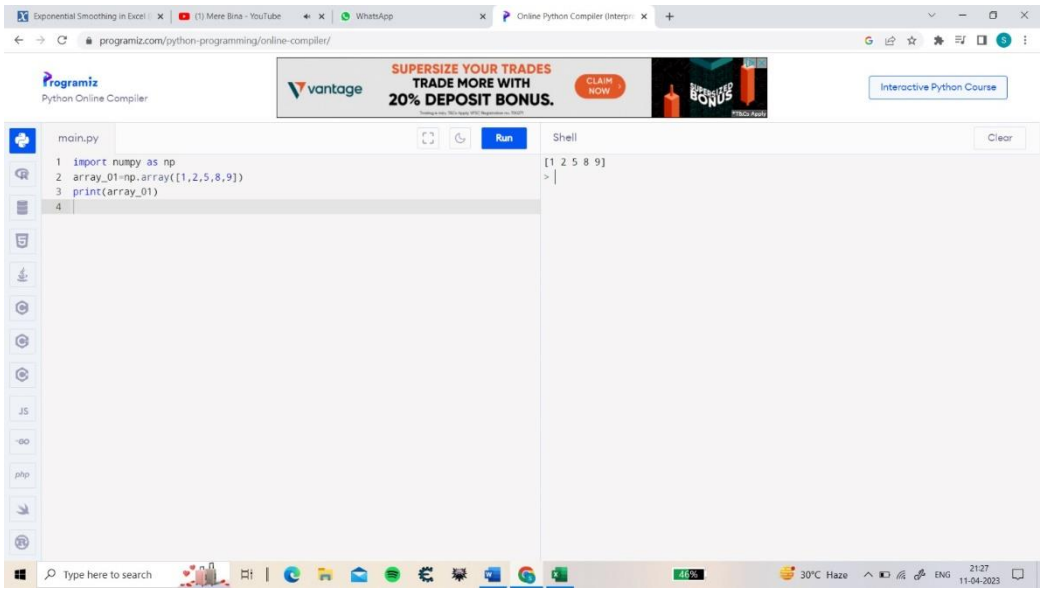
NumPy is the fundamental package for scientific computing in Python. It is a Python library that provides a multidimensional array object, various derived objects (such as masked arrays and matrices), and an assortment of routines for fast operations on arrays, including mathematical, logical, shape manipulation, sorting, selecting, I/O, discrete Fourier transforms, basic linear algebra, basic statistical operations, random simulation and much more.

Implementing numpy

1. **Array creating Code**:

```
import numpy as np

array_01=np.array([1,2,5,8,9])

print(array_01)
```

output:

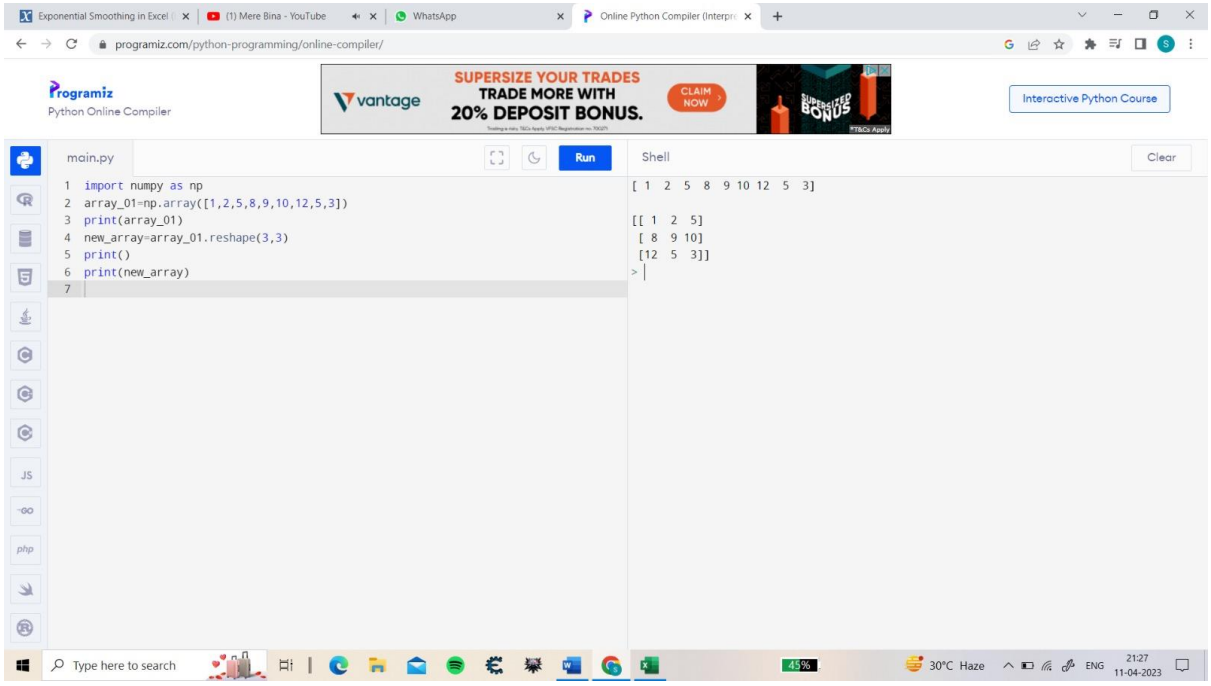


Reshape Code:

```
import numpy as np

array_01=np.array([1,2,5,8,9,10,12,5,3])

print(array_01)

new_array=array_01.reshape(3,3)
```

print()

print(new_array)



2. <u>Change data type Code:</u>

import numpy as np

x=np.array([1,2,3,4,45,67,89,80])

print("data type:",x.dtype)

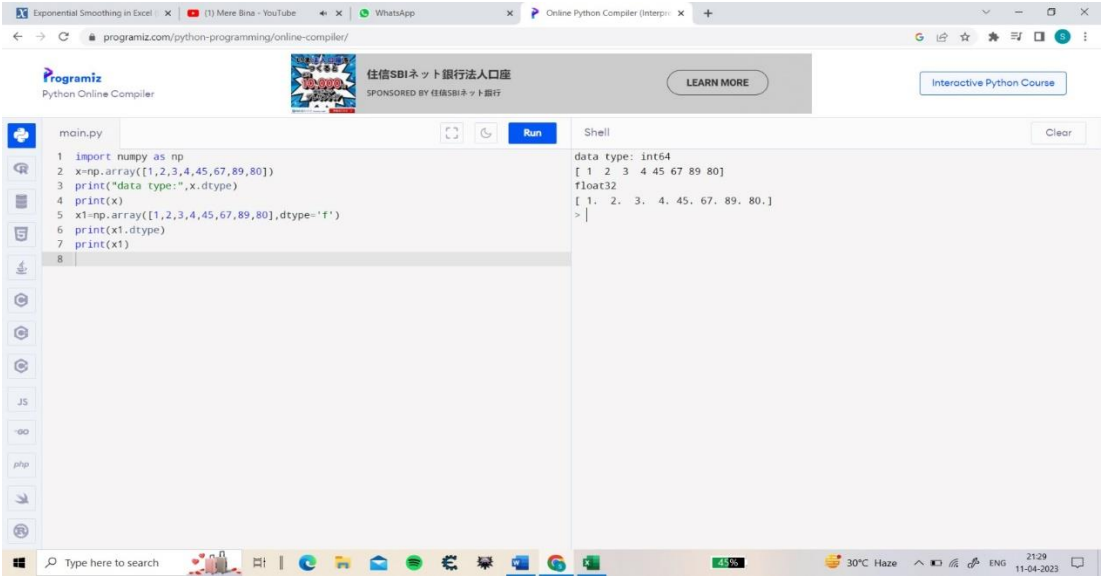
print(x)

x1=np.array([1,2,3,4,45,67,89,80],dtype='f')

print(x1.dtype)

print(x1)

output:



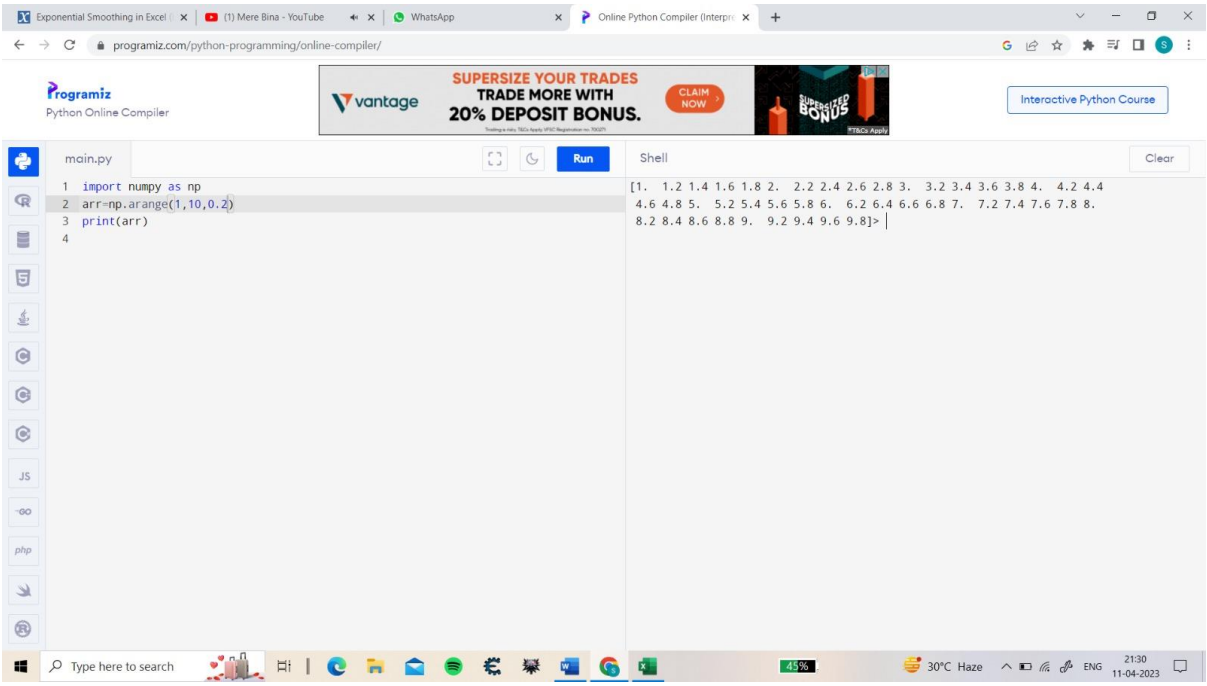
3. Arrange function Code:

import numpy as np

arr=np.arange(10,100,10)

print(arr)

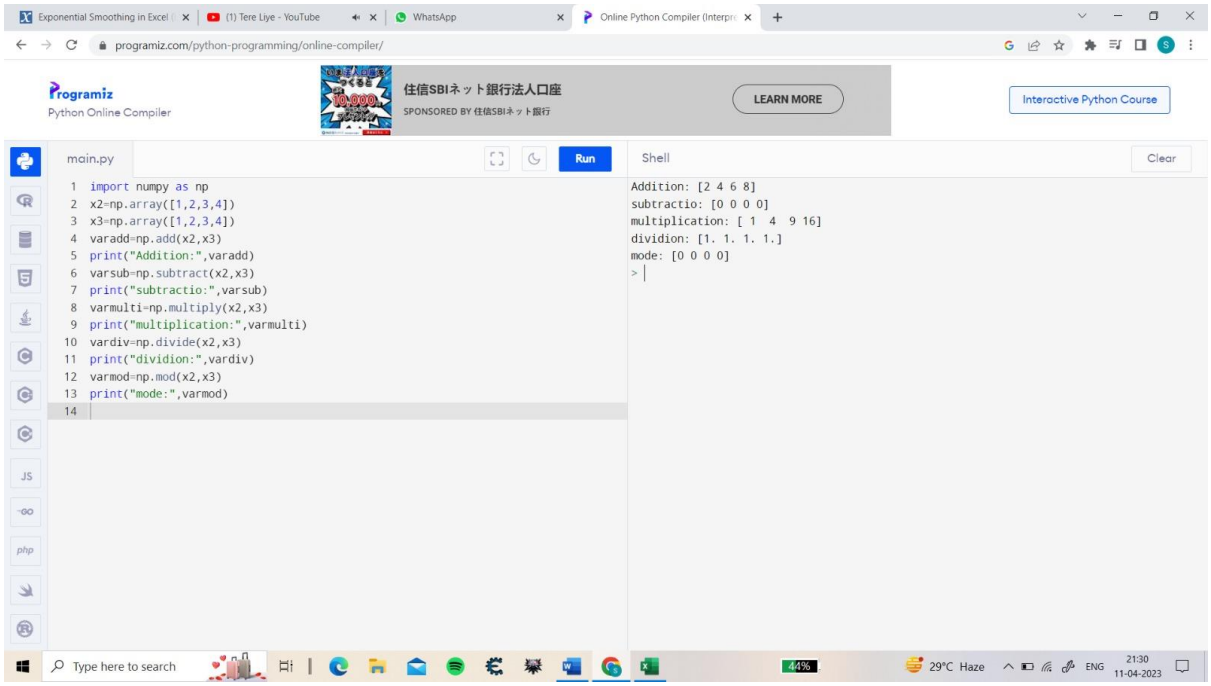
output:



4. Arithmetics Code:

```
import numpy as np

x2=np.array([1,2,3,4])

x3=np.array([1,2,3,4])

varadd=np.add(x2,x3)

print("Addition:",varadd)

varsub=np.subtract(x2,x3)

print("subtractio:",varsub)

varmulti=np.multiply(x2,x3)

print("multiplication:",varmulti)

vardiv=np.divide(x2,x3)

print("dividion:",vardiv)

varmod=np.mod(x2,x3)

print("mode:",varmod)
```

output:



Result-we were able to perform the the numpy operation sucessfully

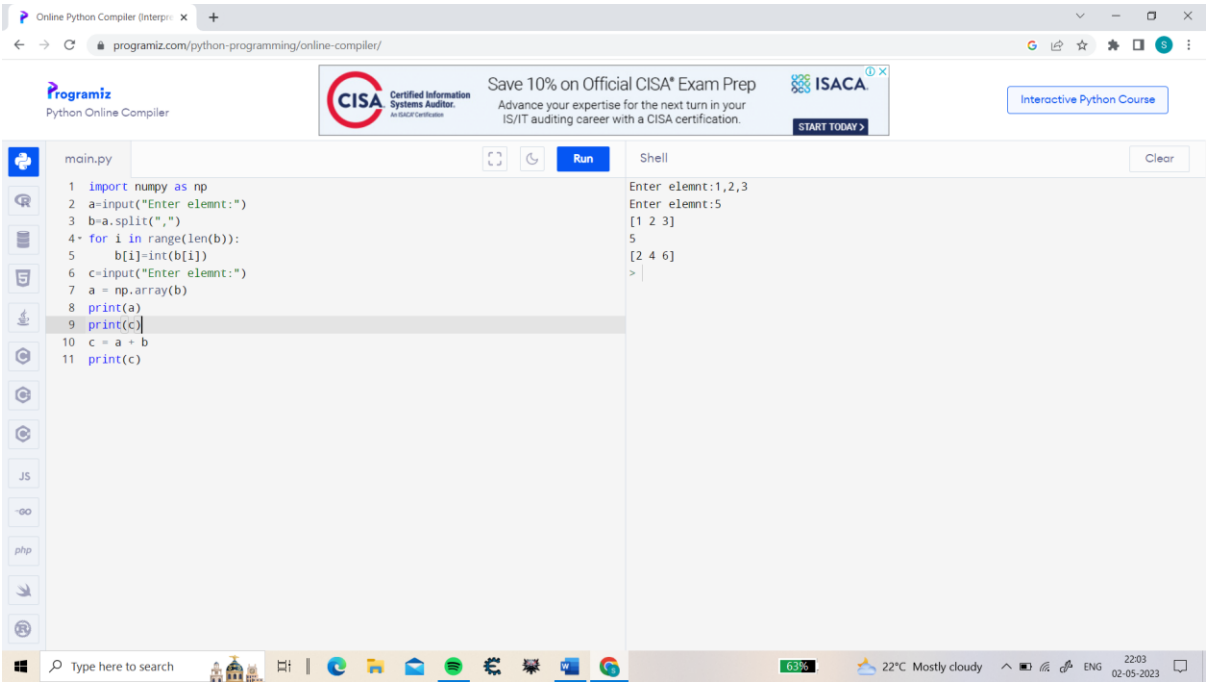
Experiment 8

Aim- Implement Numpy Broadcasting

Code-

```
import numpy as np
a=input("Enter elemnt:")
b=a.split(",")
for i in range(len(b)):
    b[i]=int(b[i])
c=input("Enter elemnt:")
a = np.array(b)
print(a)
print(c)
c = a + b
print(c)
```

Output-



Result= we were able to perform broadcasting in numpy array

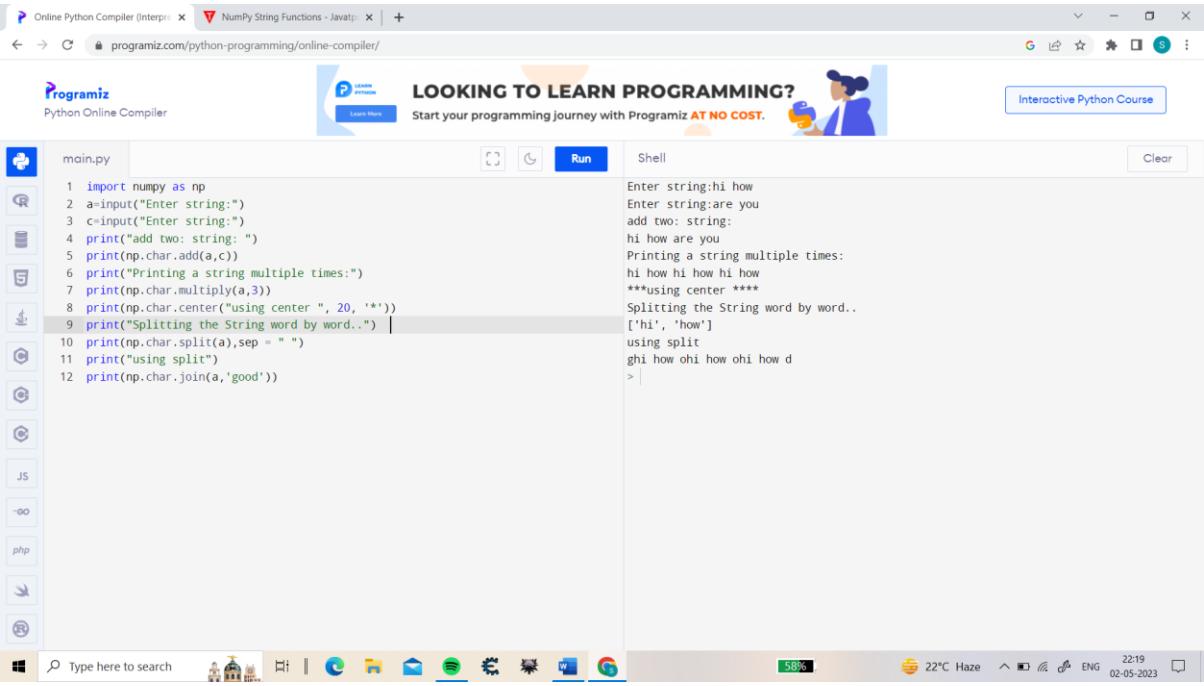
Experiment-9

Aim- Implement numpy strings function add, multiply,center split,join

Code-

```
import numpy as np
a=input("Enter string:")
c=input("Enter string:")
print("add two: string: ")
print(np.char.add(a,c))
print("Printing a string multiple times:")
print(np.char.multiply(a,3))
print(np.char.center("using center ", 20, '*'))
print("Splitting the String word by word..")
print(np.char.split(a),sep = " ")
print("using split")
print(np.char.join(a,'good'))
```

Output-



Result- We were able to perform string functions: add,multiply,center,split,join successfully

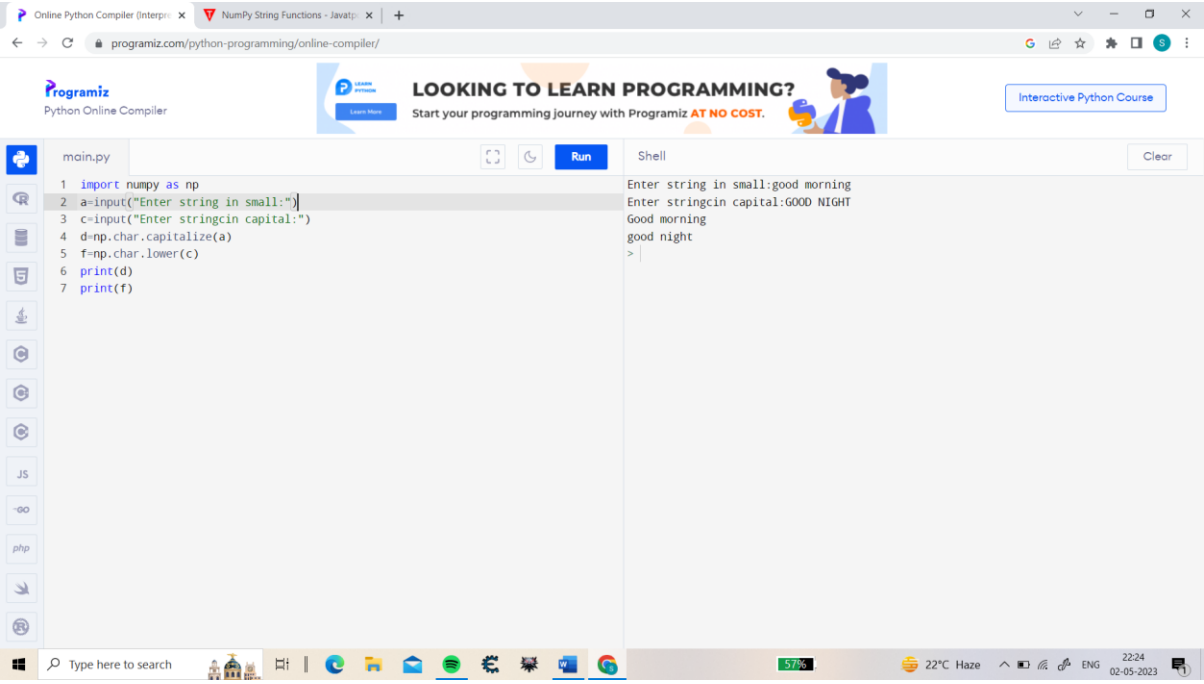
Experiment -10

Aim-Implement Numpy string functons: capitalize and lower function

Code:

```
import numpy as np
a=input("Enter string in small:")
c=input("Enter stringcin capital:")
d=np.char.capitalize(a)
f=np.char.lower(c)
print(d)
print(f)
```

OUTPUT-



Result-We successfully implemented Numpy string functions: capitalize and lower

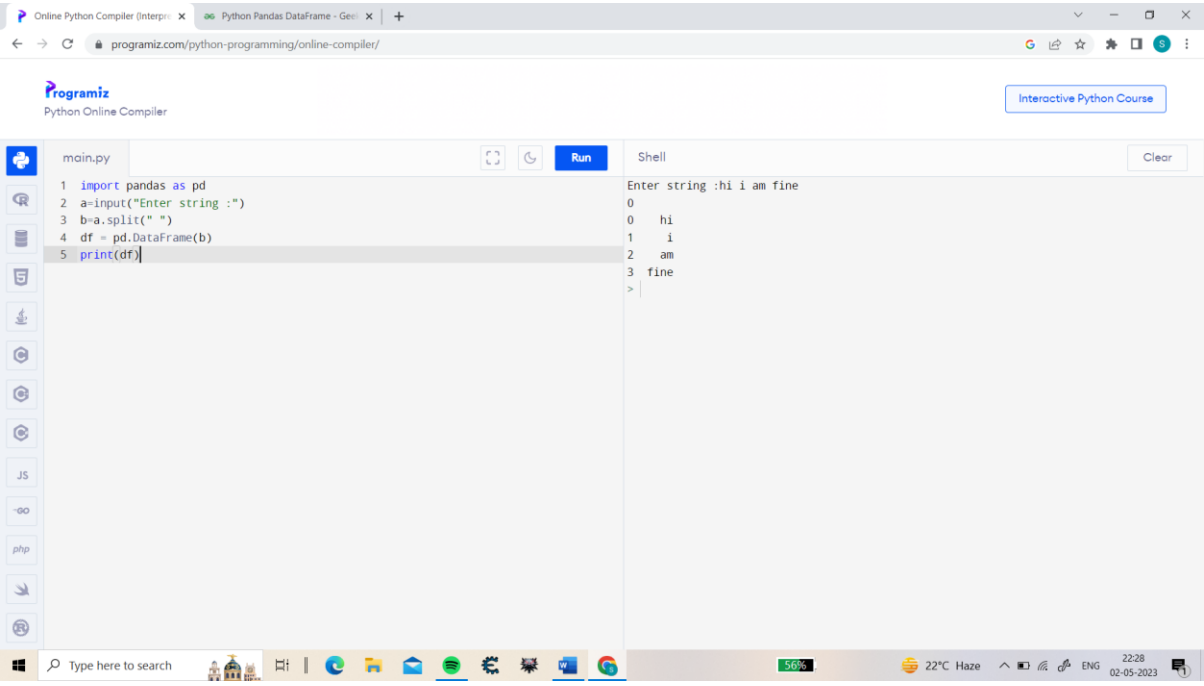
Experiment 11

Aim-Implement data frames using PANDAS library

Code-

```
import pandas as pd
a=input("Enter string :")
b=a.split(" ")
df = pd.DataFrame(b)
print(df)
```

Output



Result- We successfully implemented Data Frames using PANDAS Library

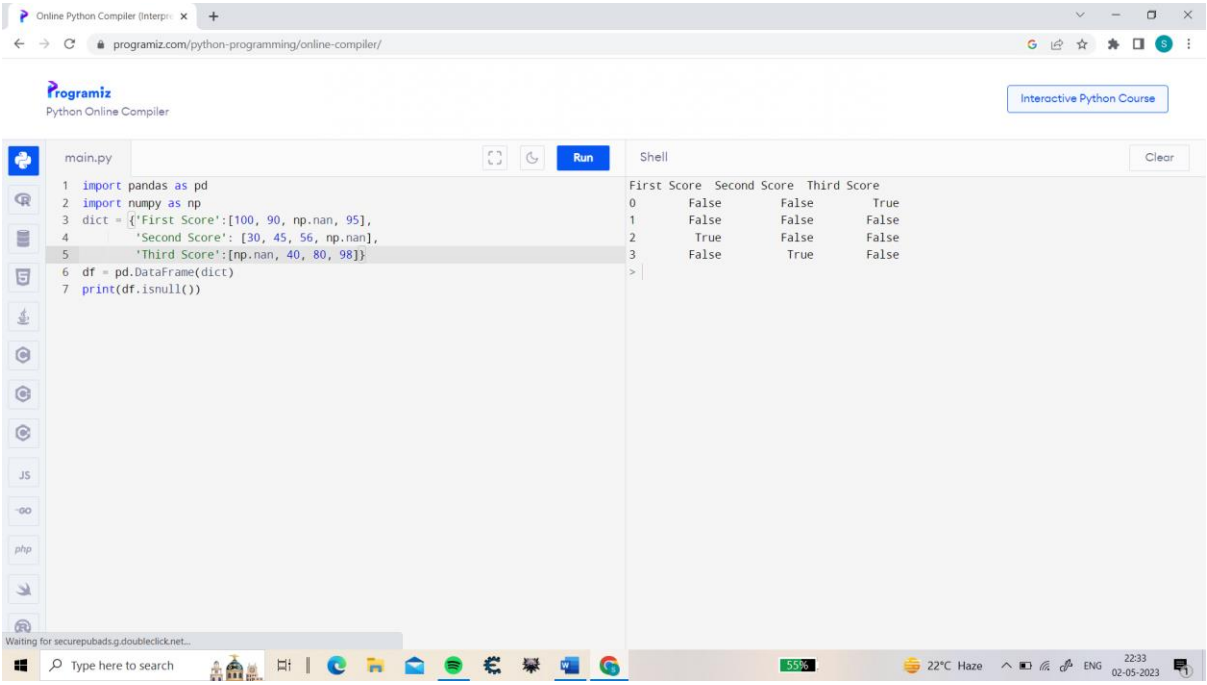
Experiment -12

Aim- Implement pandas library for working with missing values

Code-

```
import pandas as pd
import numpy as np
dict = {'First Score':[100, 90, np.nan, 95],
        'Second Score': [30, 45, 56, np.nan],
        'Third Score':[np.nan, 40, 80, 98]}
df = pd.DataFrame(dict)
print(df.isnull())
```

Output-



Result-We successfully implemented Pandas library for working with missing values.

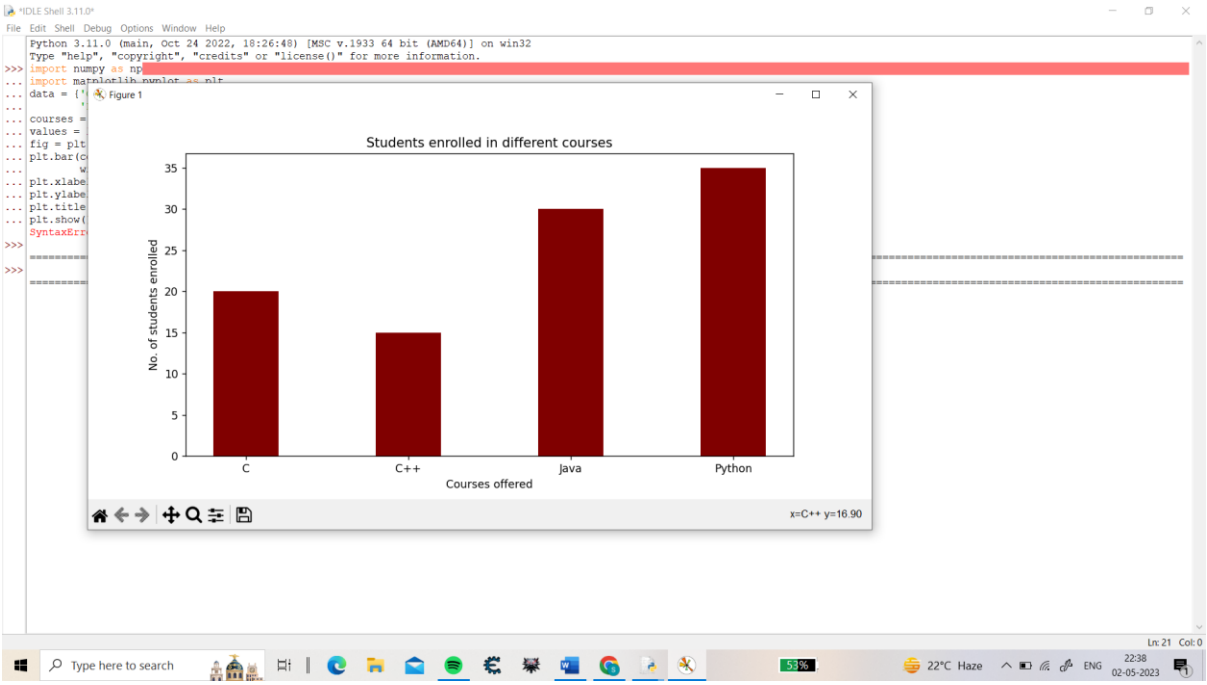
Experiment-13

Aim-Implement bar chart using Matplotlib library for data visualization.

Code-

```
import numpy as np
import matplotlib.pyplot as plt
data = {'C':20, 'C++':15, 'Java':30,
        'Python':35}
courses = list(data.keys())
values = list(data.values())
fig = plt.figure(figsize = (10, 5))
plt.bar(courses, values, color ='maroon',
        width = 0.4)
plt.xlabel("Courses offered")
plt.ylabel("No. of students enrolled")
plt.title("Students enrolled in different courses")
plt.show()
```

Output-



Result-We successfully implemented Bar Chart using Matplotlib library

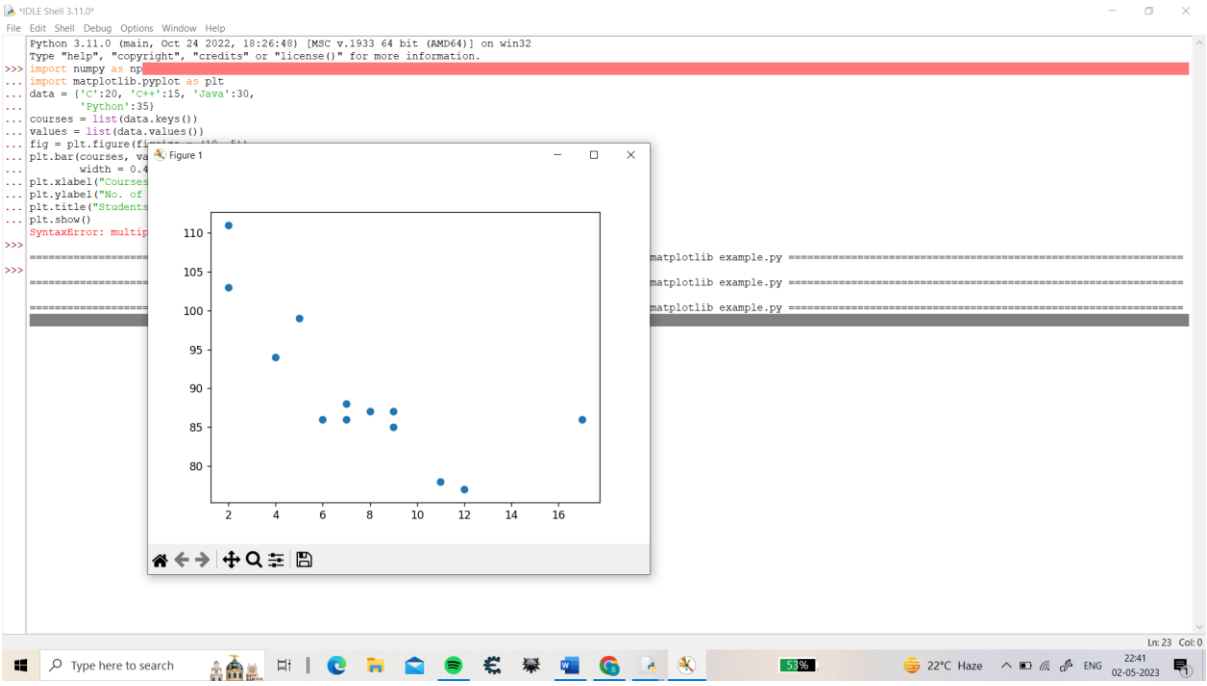
Experiment 14

Aim-Implement scatter plot using matplotlib library for data visualization.

Code-

```
import matplotlib.pyplot as plt

x = [5,7,8,7,2,17,2,9,4,11,12,9,6]
y = [99,86,87,88,111,86,103,87,94,78,77,85,86]

plt.scatter(x, y)
plt.show()
```

Output-



Result- We successfully implemented scatter plot using matplotlib library for data visualization.

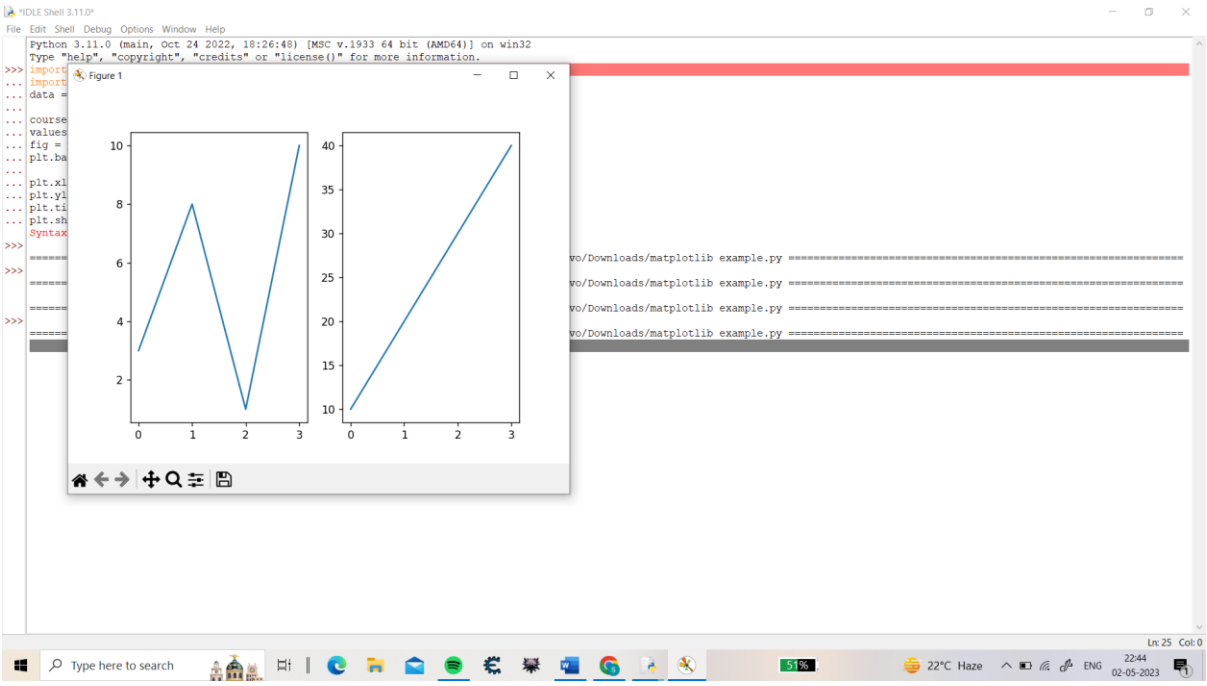
Experiment -15

Aim-Implement sub plot using matplotlib library for data visualization

Code-

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

Output-



Result- We successfully Implemented sub plot using matplotlib library for data visualization.