Experiment 1 :

#Importing Pandas

import pandas as pd  
  
student\_dict={'Name':['joe','Nat'],'Age':[20,21]}  
student\_df=pd.DataFrame(student\_dict)  
print(student\_df)  
  
  
marks\_dict={'Marks':[85.10,77.80]}  
marks\_df=pd.DataFrame(marks\_dict)  
print(marks\_df)

output :

C:\Users\ajcemca\PycharmProjects\MCA\venv\Scripts\python.exe C:/Users/ajcemca/PycharmProjects/MCA/file1.py

Name Age

0 joe 20

1 Nat 21

Marks

0 85.1

1 77.8

Experiment 2 :

import pandas as pd  
student\_dict={'Name':['joe','Nat','Sam'],'Age':[20,21,23],'Marks':[50,82,75]}  
student\_df=pd.DataFrame(student\_dict)  
print(student\_df)  
print(student\_df.iat[0,0])  
print(student\_df.get('Name'))  
print(student\_df.loc[0:2,['Name']])  
student\_df=student\_df.sort\_values(by=['Marks'])  
print(student\_df.sort\_values)  
filter=student\_df['Marks']>80  
student\_df['Marks'].where(filter,other=0,inplace=True)  
print(student\_df)  
student\_df=student\_df.filter(like='N',axis='columns')  
print(student\_df)

output:

C:\Users\ajcemca\PycharmProjects\MCA\venv\Scripts\python.exe C:/Users/ajcemca/PycharmProjects/MCA/file3.py

Name Age Marks

0 joe 20 50

1 Nat 21 82

2 Sam 23 75

joe

0 joe

1 Nat

2 Sam

Name: Name, dtype: object

Name

0 joe

1 Nat

2 Sam

<bound method DataFrame.sort\_values of Name Age Marks

0 joe 20 50

2 Sam 23 75

1 Nat 21 82>

Name Age Marks

0 joe 20 0

2 Sam 23 0

1 Nat 21 82

Name

0 joe

2 Sam

1 Nat

Experiment 3 :

import numpy as np  
arr=np.array([[1,3,6,],[2,4,6]])  
print("Shape of array:",arr.shape)  
print("Size of size:",arr.size)  
print("Array stores elements type:",arr.dtype)  
print

output :

C:\Users\ajcemca\PycharmProjects\MCA\venv\Scripts\python.exe C:/Users/ajcemca/PycharmProjects/MCA/aa.py

Shape of array: (2, 3)

Size of size: 6

Array stores elements type: int32

Process finished with exit code 0

Experiment4:

import numpy as np  
#creating array from list  
a=np.array([[1,2,4],[5,6,7]],dtype='float')  
print("Array created using passed list:\n",a)  
  
#creating array from tuple  
b=np.array((1,3,2))  
print("\nArray created using passed tuple:\n",b)  
  
#creating a 3\*4 array wiyh all zeros  
c=np.zeros((3,4))  
print("\nAn array initialized with all zeros:\n",c)  
  
#create a constant value of array of complex type  
d=np.full((3,3),6,dtype='complex')  
print("\nAn array initialized with all 6s." "Array type is complex:\n",d)  
  
#create an array with random values  
e=np.random.random((2,2))  
print("\nA random array :\n",e)  
  
#create a sequence of integers  
#from 0 to 30 with steps of 5  
f=np.arange(0,30,5)  
print("\nA sequential array with steps of 5:\n",f)  
  
#create a sequence of 10 values in range 0 to 5  
g=np.linspace(0,5,10)  
print("\nA sequential array with 10 values btw 0 and 5:\n",g)  
  
#Reshaping 3\*4 to 2\*2\*3  
arr=np.array([[1,2,3,4],  
 [5,6,7,8],  
 [1,4,3,6]])  
newarr=arr.reshape(2,2,3)  
print("\nOriginal array:\n",arr)  
print("Reshape array:\n",newarr)  
  
#flatten array  
arr=np.array([[1,2,3],[4,5,6]])  
flarr=arr.flatten()  
print("\nOriginal array:\n",arr)  
print("Flattened array:\n",flarr)

output:

C:\Users\ajcemca\PycharmProjects\MCA\venv\Scripts\python.exe C:/Users/ajcemca/PycharmProjects/MCA/file6.py

Array created using passed list:

[[1. 2. 4.]

[5. 6. 7.]]

Array created using passed tuple:

[1 3 2]

An array initialized with all zeros:

[[0. 0. 0. 0.]

[0. 0. 0. 0.]

[0. 0. 0. 0.]]

An array initialized with all 6s.Array type is complex:

[[6.+0.j 6.+0.j 6.+0.j]

[6.+0.j 6.+0.j 6.+0.j]

[6.+0.j 6.+0.j 6.+0.j]]

A random array :

[[0.43785704 0.42114076]

[0.69144804 0.66336936]]

A sequential array with steps of 5:

[ 0 5 10 15 20 25]

A sequential array with 10 values btw 0 and 5:

[0. 0.55555556 1.11111111 1.66666667 2.22222222 2.77777778

3.33333333 3.88888889 4.44444444 5. ]

Original array:

[[1 2 3 4]

[5 6 7 8]

[1 4 3 6]]

Reshape array:

[[[1 2 3]

[4 5 6]]

[[7 8 1]

[4 3 6]]]

Original array:

[[1 2 3]

[4 5 6]]

Flattened array:

[1 2 3 4 5 6]

Experiment 5

#indexing in numpy  
import numpy as np  
  
#An exempler array  
arr=np.array([[-1,2,0,4],[4,-0.5,6,0],[2.6,0,7,8],[3,-7,4,2.3]])  
  
#slicing array  
temp=arr[:2,::2]  
print("Array with first 2 rows and alternate columns(0 and 2):\n",temp)  
  
#integer array indexing example  
temp=arr[[0,1,2,3],[3,2,1,0]]  
print("\nElements at indices (0,3),(1,2),(2,1),""(3,0):\n",temp)  
  
#boolean array indexing exapmle  
cond=arr>0 #cond is a boolean array  
temp=arr[cond]  
print('\nElements greater than 0:\n',temp)

Output

C:\Users\ajcemca\PycharmProjects\MCA\venv\Scripts\python.exe C:/Users/ajcemca/PycharmProjects/MCA/file7.py

Array with first 2 rows and alternate columns(0 and 2):

[[-1. 0.]

[ 4. 6.]]

Elements at indices (0,3),(1,2),(2,1),(3,0):

[4. 6. 0. 3.]

Elements greater than 0:

[2. 4. 4. 6. 2.6 7. 8. 3. 4. 2.3]

Experiment 6

#basic operations on single array  
import numpy as np  
a=np.array([1,2,5,3])  
  
#add 1 to every element  
print("Adding 1 to every element:",a+1)  
  
#sub 3 from each element  
print("Substracting 3 from each element:",a-3)  
  
#multiply each element by 10  
print("Multiplying each element by 10:",a\*10)  
  
#Square each element  
print("Squareing each element:",a\*\*2)  
  
#modifying existing array  
a\*=2  
print("Double each element of original array:",a)  
  
#transpose of array  
a=np.array([[1,2,3],[3,4,5],[9,6,0]])  
  
print("\nOriginal array:\n",a)  
print("\nTranspose of array:\n",a.T)

Output

C:\Users\ajcemca\PycharmProjects\MCA\venv\Scripts\python.exe C:/Users/ajcemca/PycharmProjects/MCA/file8.py

Adding 1 to every element: [2 3 6 4]

Substracting 3 from each element: [-2 -1 2 0]

Multiplying each element by 10: [10 20 50 30]

Squareing each element: [ 1 4 25 9]

Double each element of original array: [ 2 4 10 6]

Original array:

[[1 2 3]

[3 4 5]

[9 6 0]]

Transpose of array:

[[1 3 9]

[2 4 6]

[3 5 0]]

Process finished with exit code 0

Experiment 7

import pandas as pd  
import matplotlib.pyplot as plt  
  
df=pd.read\_csv('D:\MCA\Tebin J\Marklist.csv')  
  
print(df.head(5))  
print(df.tail(5))  
print(df.shape)  
print(df.head(5))

output

C:\Users\ajcemca\PycharmProjects\MCA\venv\Scripts\python.exe C:/Users/ajcemca/PycharmProjects/MCA/file9.py

RollNo Name Mark1 Mark2 Mark3

0 101 sam 34 56 43

1 102 job 55 42 53

2 103 alex 66 45 62

3 104 anton 55 47 64

4 105 arun 44 50 29

RollNo Name Mark1 Mark2 Mark3

5 106 tom 66 77 44

6 107 amal 77 65 54

7 108 jeena 34 64 72

8 109 sinu 76 55 46

9 110 ajmal 76 44 65

(10, 5)

RollNo Name Mark1 Mark2 Mark3

0 101 sam 34 56 43

1 102 job 55 42 53

2 103 alex 66 45 62

3 104 anton 55 47 64

4 105 arun 44 50 29

Process finished with exit code 0

Experiment 8

import matplotlib.pyplot as plt  
fig = plt.figure()  
ax = fig.add\_subplot(111)  
ax.plot([1, 2, 3, 4], [10, 20, 25, 30], color='lightblue', linewidth=3)  
ax.scatter([0.3, 3.8, 1.2, 2.5], [11, 25, 9, 26], color='darkgreen', marker='\*')  
ax.set\_xlim(0.5, 4.5)  
plt.show()

output

