Name of the Paper	**:**	**Soft Computing**
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Course	**:**	**BCA**
Semester	**:**	**6th**
Department	**:**	**Computational Science**

ASSIGNMENT-2
(Assignment on Numpy and MatPlotLib)

1.Create a numpy array containing integer from 1 to 100.Display the array

In [2]:
```
import numpy as np
np_array= np.arange(1, 101)
print("output\n",np_array)
```

```
output
 [  1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18
  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35  36
  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  52  53  54
  55  56  57  58  59  60  61  62  63  64  65  66  67  68  69  70  71  72
  73  74  75  76  77  78  79  80  81  82  83  84  85  86  87  88  89  90
  91  92  93  94  95  96  97  98  99 100]
```

2.Show only the even numbers in the array.Append three numbers 102,112,134 in the array

In [34]:
```
array=np_array[np_array%2==0]
array=np.append(array,[102,112,134])
print("output\n",array)
```

```
output
 [  2   4   6   8  10  12  14  16  18  20  22  24  26  28  30  32  34  36
  38  40  42  44  46  48  50  52  54  56  58  60  62  64  66  68  70  72
  74  76  78  80  82  84  86  88  90  92  94  96  98 100 102 112 134]
```

3.Remove 91 to 96 from the array .Insert 104 as the fifth element in the array

In [37]:
```
r =range(90,96)
index=list(r)
np_array = np.delete(np_array, index)
np_array= np.insert(np_array,4,104)
print("output\n",np_array)
```

```
output
 [  1   2   3   4 104   5   6   7   8   9  10  11  12  13  14  15  16  17
  18  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35
  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  52  53
  54  55  56  57  58  59  60  61  62  63  64  65  66  67  68  69  70  71
  72  73  74  75  76  77  78  79  80  81  82  83  84  85  86  87  88  89
  90  97  98  99 100]
```

4.Create two numpy array.Array1 (12,34,56,32,18) Array 2(11,8,23,45,33)

In [39]:
```
Array1=np.array([12,34,56,32,18])
Array2=np.array([11,8,23,45,33])
print("output\n Array1= {} Array2= {}".format(Array1,Array2))
```

```
output
 Array1= [12 34 56 32 18] Array2= [11  8 23 45 33]
```

5.Add both the arrays.Then sort the array

In [42]:
```
out_arr = np.add(Array1, Array2)
print ("added array : ", out_arr)
print("After sorting:" ,np.sort(out_arr))
```

```
added array :  [23 42 79 77 51]
After sorting: [23 42 51 77 79]
```

6.Remove second last element of the array

In [44]:
```
n=len(out_arr)
print("remaining elements after deleting 1st element ",np.delete(out_arr, n-2))
```

```
remaining elements after deleting 1st element  [23 42 79 51]
```

7.Read the array in reverse order

In [45]:
```
reversed_arr =out_arr[::-1]
print("output\n",reversed_arr)
```

```
output
 [51 77 79 42 23]
```

8.Find the position of 42 from the array

In [47]:
```
result = np.where(reversed_arr == 42)
print("output\n",result)
```

```
output
 (array([3], dtype=int64),)
```

9.Create numpy arrays having marks of student.Subjects: Physics,Chemistry,Math .No of students: 8(minimum)

In [3]:
```
import pandas as pd
```

In [14]:
```
my_np1=np.array([[int(x) for x in input().split()],
                 [int(y) for y in input().split()],[int(z) for z in input().split()]])
#print(my_np1)

my_pd=pd.DataFrame(data=[my_np1[0],my_np1[1],my_np1[2]]).T
#print(my_pd)
my_pd.columns=['Physics','Chemestiry','Math']
print(my_pd)
```

```
21 32 43 56 21 56 78 98
20 33 45 53 25 52 76 93
11 23 33 44 55 66 77 88
   Physics  Chemistry  Math
0       21         20    11
1       32         33    23
2       43         45    33
3       56         53    44
4       21         25    55
5       56         52    66
6       78         76    77
7       98         93    88
```

10.Find the following: Highest marks in math Highest marks in total

In [28]:
```
my_pd['Total']=my_pd['Physics'] + my_pd['Chemistry']+my_pd['Math']
print(my_pd)
print("Highest marks in math ",max(my_pd['Math']))
print("Highest marks in Total ",max(my_pd['Total']))
```

```
   Physics  Chemistry  Math  Total
0       21         20    11     52
1       32         33    23     88
2       43         45    33    121
3       56         53    44    153
4       21         25    55    101
5       56         52    66    174
6       78         76    77    231
7       98         93    88    279
Highest marks in math  88
Highest marks in Total  279
```

11.Sorted array for physics according to marks ascending order

In [33]:
```
print("Sorted array for physics according to marks ascending order")
my_pd['Physics'].sort_values(ascending = True)
```

```
Sorted array for physics according to marks ascending order
```

Out[33]:
```
0   21
4   21
1   32
2   43
3   56
5   56
6   78
7   98
Name: Physics, dtype: int64
```

12.Remove below 40% marks from chemistry

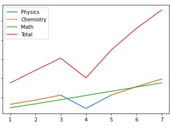
In [79]:
```
l=[]
for i,j in enumerate(my_pd['Chemistry']):

    if(j< 40):
        #print(i)
        l.append(i)
        my_pd['Chemistry'].drop(my_pd['Chemistry'].index[l])
#print(l)

print(my_pd['Chemistry'])
```

```
1    32.0
2    43.0
3    56.0
4     NaN
5    56.0
6    78.0
7    98.0
Name: Chemistry, dtype: float64
```

13.Plot Physics vs chemistry vs maths marks

In [92]:
```
my_pd.plot()
```

Out[92]:
```
<AxesSubplot:>
```



In [ ]:
```
14.Create the following lists:
```

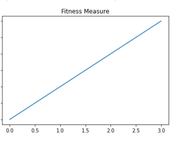
In [93]:
```
import pandas as pd

data = {'Day': [1,2,3,4,5,6,7,8,9,10],
        'Steps Cover': [5000,5000,5000,6000,6400,6200,6800,5400,6800,7000],
        'Calorie Burn(kcal)': [20,20,20,30,30,30,35,25,37,40]


       }

df = pd.DataFrame(data,columns=['Day','Steps Cover','Calorie Burn(kcal)'])
print (df)
```

```
   Day  Steps Cover  Calorie Burn(kcal)
0    1         5000                  20
1    2         5000                  20
2    3         5000                  20
3    4         6000                  30
4    5         6400                  30
5    6         6200                  30
6    7         6800                  35
7    8         5400                  25
8    9         6800                  37
9   10         7000                  40
```

15.Draw the line plot. Show the title as "Fitness Measure". Give the marker with red color and green face color. Only the horizontal gridline should be shown

In [95]:
```
import matplotlib.pyplot as plt
x=[1,2,3,4]
plt.plot(x)
plt.title('Fitness Measure')
```

Out[95]:
```
Text(0.5, 1.0, 'Fitness Measure')
```

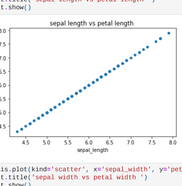


16.Plot the following from iris dataset. Plot sepal length vs petal length (scatter plot) Plot sepal width vs petal width Plot histogram with petal length

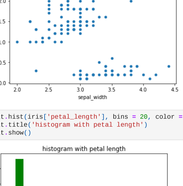
In [96]:
```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import numpy as np
```

In [98]:
```
iris = pd.read_csv("iris.csv")
```

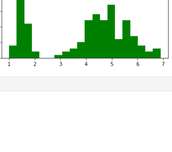
In [101]:
```
iris.plot(kind='scatter', x='sepal_length', y='petal_length')
plt.title('sepal length vs petal length ')
plt.show()
```



In [105]:
```
iris.plot(kind='scatter', x='sepal_width', y='petal_width')
plt.title('sepal width vs petal width ')
plt.show()
```



In [113]:
```
plt.hist(iris['petal_length'], bins = 20, color = "green")
plt.title('histogram with petal length')
plt.show()
```



In [ ]:
```
```