program 02

1. demonstrate array aggregate functions using Numpy
2. demonstarte aggregate function using pandas

Numpy Aggregation functions

```
# Numpy Aggregation functions on Array

import numpy as np

a = np.array([10,18,12,3,9,6,15])
print("The given array is : ", a)
print()

minimum = np.min(a)
maximum = np.max(a)
sum = np.sum(a)
avg = np.mean(a)
median = np.median(a)
std = np.std(a)
var = np.var(a)
min_index = np.argmin(a)
max_index = np.argmax(a)

values = {
    "Minimum" : minimum,
    "MAximum" : maximum,
    "Sum" : sum,
    "Average" : avg,
    "Median" : median,
    "Standard Deviation" : std,
    "Variance" : var,
    "Minimum index" : min_index,
    "Maximum index" : max_index
}

for key,values in values.items():
  print(key,":",values)
```

```
The given array is :  [10 18 12  3  9  6 15]

Minimum : 3
MAximum : 18
Sum : 73
Average : 10.428571428571429
Median : 10.0
Standard Deviation : 4.746642207381757
Variance : 22.530612244897956
Minimum index : 3
Maximum index : 1
```

pandas Aggregation Functions

```
# pandas aggregate functions

import pandas as pd

df = pd.DataFrame({
    "Maths" : [70,85,95,100,89,99,69,56],
    "Statistics" : [100,78,96,69,85,52,75,89],
    "Accountancy" : [89,96,89,98,59,73,100,99],
    "Gender" : ['M','F','F','M','M','F','M','M']
})
print(df)
print()
print("Statistical measures : \n",df.describe())
print()
print("Sum of each column :\n",df.sum())
print()
print("To print the information about the dataframe :")
print(df.info())
print()
```

```
print("Grouping based on genders : \n",df.groupby("Gender").sum())
print()
print("df agg() method : \n",df.drop('Gender',axis=1).agg(['sum','mean','std']))
```

```
   Maths  Statistics  Accountancy Gender
0     70         100           89      M
1     85          78           96      F
2     95          96           89      F
3    100          69           98      M
4     89          85           59      M
5     99          52           73      F
6     69          75          100      M
7     56          89           99      M

Statistical measures :
             Maths  Statistics  Accountancy
count    8.000000    8.000000     8.000000
mean    82.875000   80.500000    87.875000
std     16.137246   15.556349    14.623245
min     56.000000   52.000000    59.000000
25%     69.750000   73.500000    85.000000
50%     87.000000   81.500000    92.500000
75%     96.000000   90.750000    98.250000
max    100.000000  100.000000   100.000000

Sum of each column :
 Maths               663
Statistics          644
Accountancy         703
Gender         MFFMMFMM
dtype: object

To print the information about the dataframe :
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8 entries, 0 to 7
Data columns (total 4 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   Maths        8 non-null      int64
 1   Statistics   8 non-null      int64
 2   Accountancy  8 non-null      int64
 3   Gender       8 non-null      object
dtypes: int64(3), object(1)
memory usage: 384.0+ bytes
None

Grouping based on genders :
         Maths  Statistics  Accountancy
Gender
F         279         226          258
M         384         418          445

df agg() method :
            Maths  Statistics  Accountancy
sum   663.000000  644.000000   703.000000
mean   82.875000   80.500000    87.875000
std    16.137246   15.556349    14.623245
```

```
Start coding or generate with AI.
```