PROBLEM STATEMENT:

Write a Python program to **store marks scored** in subject **"Fundamental of Data Structure"** by **N students** in the class. **Write functions to compute following:**

a) The **average score** of class.
b) **Highest** score and **lowest** score of class.
c) **Count** of students who were **absent** for the test.
d) **Display** mark with **highest frequency.**

ANALYSIS OF A PROBLEM STATEMENT:

1. Given :

Marks scored in subject "**F**undamental of **D**ata **S**tructure" by **N** Students.

2. Entity:

Here in the Problem statement Entity is subject **FDS** and attribute of entity is **Marks**.

3. Input:

Here we have to accept subject FDS **marks of N Students** as a input from user.

4. Data Structure:

To store/organize the marks in memory we required **LIST** as a data structure.

5. Output:

5.1 The average score of class
5.2 Highest Score and Lowest Score of a Class.
5.3 Count of a student who were absent for the Test.
5.4 Display marks with highest frequency.

DESIGN OF ALGORITHM:

5.1 To find out the average score of a class.

Algorithm: To find out the average score of a class.

Step 1: Start

Step 2: **initialize** sum1=0, cnt=0 and Avg_Score=0

Step 3: **Accept** subject FDS **marks** of **N** Student from user for absent student please enter -1.

Step 4: **Take** mark **m** from **marks** till marks avail in it, if not goto step 5

Step 4.1: **Check** if m **equals** to -1 then cnt = cnt +1 and goto **step 4.**

Step 4.2: **compute** sum1= sum1 + m and goto step 4.

Step 5: **Compute** Avg_Score= sum1/(N-cnt)

Step 6: **Display** the average score of a class is **Avg_Score.**

Step 7: Stop

Source Code:

```
cnt=0
total=0
avg=0
marks=[1,2,-1,3,-1,4]
n=len(marks)
print("No of Elements in list:",n)
for num in marks:
    if num==-1:
        cnt=cnt+1
    else:
        total=total+num
print("Total of all marks are:",total)
avg=total/(n-cnt)
print("The avg score of class is:",avg)
```

OutPut:

```
No of Elements in list: 6
Total of all marks are: 10
The avg score of class is: 2.5
>>>
```

Input of Program:

marks=[1,2,-1,3,-1,4]

5.2 To find out Highest Score and Lowest Score of a class.

Algorithm: For to find out the Highest score of class.

Step 1: **S**tart

Step 2: **initialize** Hscore=0

Step 3: **Accept** subject FDS **marks** of **N** Student from user for absent student please enter -1.

Step 4: **Take** mark **m** from **marks** till marks avail in it, if not goto **step 5**

Step 4.1: check if **m > Hscore** then set **Hscore = m** and goto **step 4.**

Step 4.2: check if **m < Hscore** then goto **step 4.**

Step 5: **Display** the Highest score of a class is **Hscore.**

Step 6: **S**top

Logic of Highest Score:

```
Hscore=0
for n1 in marks:
    if n1>Hscore:
        Hscore=n1
print("Highest score is:",Hscore)
```

OutPut of Program:

Highest score is: 4

Input of Program:

marks=[1,2,-1,3,-1,4]

Algorithm: For to find out the Lowest score of class.

Step 1: **S**tart

Step 2: **initialize** Lscore=999

Step 3: **Accept** subject FDS **marks** of **N** Student from user for absent student please enter -1.

Step 4: **Take** mark **m** from **marks** till marks avail in it, if not goto **step 5**

Step 4.1: check if **m == -1** then goto **step 4.**

Step 4.2: check if **m < Lscore** then set **Lscore = m** and goto **step 4.**

Step 5: **Display** the Lowest score of a class is **Lscore.**

Step 6: **S**top

Logic of Highest Score:

```
Lscore=999
cnt=0
for n2 in marks:
    if n2 == -1:
        cnt=cnt+1
    elif n2 < Lscore:
        Lscore=n2
print("Lowest score is:",Lscore)
```

OutPut of Program:

Lowest score is: 1

Input of Program:

marks=[1,2,-1,3,-1,4]

5.3 To find out count of a student who were absent for the Test.

Algorithm: To find out Count of students who were absent for the test

Step 1: **S**tart

Step 2: **initialize** count=0

Step 3: **Accept** subject FDS **marks** of **N** Student from user for absent student please enter -1.

Step 4: **Take** mark **m** from **marks** till marks avail in it, if not goto **step 5**

Step 4.1: **check** if **m == -1** then increment count by 1 ie **count= count + 1** and goto step 4.

Step 5: **Display** the Count of **total number of absent** student **count.**

Step 6: **S**top

Logic of Absent Student:

```
absent=0
for n3 in marks:
    if n3==-1:
        absent = absent + 1
print("Total number of absent students are:",absent)
```

OutPut of Program:

Lowest score is: 1

Input of Program:

marks=[1,2,-1,3,-1,4]

Write a Python program to store marks scored in subject "Fundamental of Data Structure" by N students in the class. Write functions to compute following:

a) The average score of class
b) Highest score and lowest score of class
c) Count of students who were absent for the test
d) Display mark with highest frequency

Hardware Requirement:

Processor: Intel(R) Core(TM)2 Duo CPU E7500 @ 2.93GHz
Memory: 2.00 GB
Operating System: 64-bit Open source

Software Requirement:

Programming tool like PyCharm with Python 3.X.X Interpreter

SOURCE PROGRAM:

Prog2.py

```
print("GroupA Assignment No 02")
print("Menu Driven Program For FDS Test of 30 Marks Analysis:")
print("================== ====== ==============================")
marks=['NA',12,22,20,23,24,25,'AB',25,21,25,'AB',22,'AB',25,28]
print("The Students gets the marks in FDS Test out of 30M are as follows...")
print(marks)
def mainMenu():
    print("1.The average score of class SEA")
    print("2.Highest score and lowest score of class")
    print("3.Count of Students who were absent for the test")
    print("4.Display mark with highest frequency")
    print("5.Exit")
    ch=int(input("Enter your choice::"))
    if ch==1:
        print("1.The average score of class SEA:")
        avgScore()
        print("---------- ------- ------------------------------")
        mainMenu()
```

```
    elif ch==2:
        print("2.Highest score and lowest score of class")
        highScore()
        lowScore()
        print("---------- ******* ------------------------------")
        mainMenu()
    elif ch==3:
        print("3.Count of Students who were absent for the test")
        absntStud()
        print("---------- ******* ------------------------------")
        mainMenu()
    elif ch==4:
        print("4.Display mark with highest frequency")
        freqHigh()
        print("---------- ******* ------------------------------")
        mainMenu()
    elif ch==5:
        exit
    else:
        print("please enter valid choice:")
        mainMenu()


def avgScore():
    cnt=0
    Avg=0
    Total=0
    n=len(marks)
    print("Total Strength of Class SE A is::",n)
    for x in marks:
        if type(x)==type(" "):
            cnt=cnt+1
        else:
            Total=Total+x
    Avg=Total/(n-cnt)
    print("The Average Score of Class is::",Avg)
```

```
def highScore():
    max=0
    cnt=0
    for x in marks:
        if type(x)==type(" "):
            cnt=cnt+1
        elif x>max:
            max=x
    print("The Highest Marks in FDS Test is:",max)

def lowScore():
    min=99
    cnt=0
    for x in marks:
        if type(x)==type(" "):
            cnt=cnt+1
        elif x<min:
            min=x
    print("The Lowest Marks in FDS Test is:",min)

def absntStud():
    absnt=0
    for x in marks:
        if type(x)== type(" "):
            absnt=absnt+1
    print("Count of Students who were Absent for the FDS Test is:",absnt-1)
```

```
def freqHigh():
    cnt = p = high = mm = 0
    for n in range(31):
        cnt = 0
        for x in marks:
            if type(x) == type(" "):
                p = p + 1
            elif x == n:
                cnt = cnt + 1
        count.append(cnt)
    print("The marks in FDS Test are as Follows...")
    print(marks)
    print("Count of each marks from 0 to 30 are as follows..")
    print(count)
    for y in count:
        if y > high:
            high = y
    print("Highest frequency of is:", high)
    for z in range(31):
        if count[z] == high:
            mm = z
    print("Marks of highest frequency is:", mm)
```

OUTPUT:

GroupA Assignment No 02
Menu Driven Program For FDS Test of 30 Marks Analysis:
========== ******
==========
The Students gets the marks in FDS Test out of 30M are as follows...
['NA', 12, 22, 20, 23, 24, 25, 'AB', 25, 21, 25, 'AB', 22, 'AB', 25, 28]
>>> mainMenu()
1.The average score of class SEA
2.Highest score and lowest score of class

3.Count of Students who were absent for the test
4.Display mark with highest frequency
5.Exit
Enter your choice::1
1.The average score of class SEA:
Total Strength of Class SE A is:: 16
The Average Score of Class is:: 22.666666666666668
---------- ******* ----------
1.The average score of class SEA
2.Highest score and lowest score of class
3.Count of Students who were absent for the test
4.Display mark with highest frequency
5.Exit
Enter your choice::2
2.Highest score and lowest score of class
The Highest Marks in FDS Test is: 28
The Lowest Marks in FDS Test is: 12
---------- ******* ----------
1.The average score of class SEA
2.Highest score and lowest score of class
3.Count of Students who were absent for the test
4.Display mark with highest frequency
5.Exit
Enter your choice::3
3.Count of Students who were absent for the test
The Students gets the marks in FDS Test out of 30M are as follows...
['NA', 12, 22, 20, 23, 24, 25, 'AB', 25, 21, 25, 'AB', 22, 'AB', 25, 28]
Count of Students who were Absent for the FDS Test is: 3
---------- ******* ----------
1.The average score of class SEA
2.Highest score and lowest score of class
3.Count of Students who were absent for the test
4.Display mark with highest frequency
5.Exit

Enter your choice::4
.Display mark with highest frequency
The marks in FDS Test are as Follows...
['NA', 12, 22, 20, 23, 24, 25, 'AB', 25, 21, 25, 'AB', 22, 'AB', 25, 28]
Count of each marks from 0 to 30 are as follows..
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 2, 1, 1, 4, 0, 0, 1, 0, 0]
Highest frequency of is: 4
Marks of highest frequency is: 25