ASSIGNMENT 2

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Assignment 2

Objective :

To illustrate traversing of array elements to perform different operations.

Outcome :

Students will able to apply knowledge of one dimansional array to perform different operations like sum , average of array elements,maximum, minimum from given set of elements.

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

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Algorithm :

1. list to dict:-

Step 1) start

Step 2) Intilise an empty dictionary.

Step 3) for every i element in input_list jump to step4 else step5.

Step 4) if there is key i in dictionary then increment value by 1 else set it to 0 then increment value by 1.

Step 5) Return list_return

Step 6) exit()

2. Mean:-

Step 1) start

Step 2) Intilise the add=0.

Step 3) for every i element input_list jump to step4 else step6.

Step 4) add i to varible add jump to step5 else step3.

Step 5) Return add/length(input_list)

Step 6) exit()

3. Minimum:-

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Step 1) start

Step 2) Intilise the lower as first element of input_list .

Step 3) for every i element in input_lists jump to step4 else step5.

Step 4) if i is less than lower jump to step 5 else jump to step 3.

Step 5) set lower = i jump to step 3.

Step 6) Return lower

Step 7) exit()

4. Maximum:-

Step 1) start

Step 2) Intilise the lower as first element of input_list .

Step 3) for every i element in input_lists jump to step4 else step5.

Step 4) if i is greater than higher jump to step 5 else jump to step 3.

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Step 5) set higher=i jump to step 3.

Step 6) Return higher

Step 7) exit()

5. Max_frequency:-

Step 1) start

Step 2) Intilise the max as zero.

Step 3) for key in di jump to step4 else step7.

Step 4) if i equal to 0 jump to step 3 else jump to step 5.

Step 5) if value of i is greater than max then jump to step 6 else jump to step 3.

Step 6) max= i jump to step 3.

Step 7) return max

Step 8) exit()

Program/Code:

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```
list = [90, 99, 98, 95, 94, 0, 0, 0, 0, 0, 45, 78, 98, 45, 56, 13, 98, 72, 65,
84, 48, 45, 94, 95, 96, 97, 99,90,90]


def list_to_dict(input_list):
    dictionary = {}
    for i in input_list:
        dictionary[i] = dictionary.get(i, 0) + 1
    return dictionary


def mean(input_list):
    add = 0
    for i in input_list:
        add += i
    return add / len(input_list)


def minimum(input_list):
    lower = input_list[0]
    for i in input_list:
        if i == 0:
            continue
        else:
            if lower > i:
                lower = i
    return lower


def maximum(input_list):
    higher = 0
    for i in input_list:
        if i == 0:
            continue
        else:
            if higher < i:
                higher = i
    return higher


def max_frequency(di):
    max = 0
    for i in di:
        if i == 0:
            continue
        elif di[i] > max:
            max = i
    return max
```

```
# The average score of class
print("The average score of class : ", mean(list))

# Highest score and lowest score of class
print("Highest score of class : ", maximum(list))
print("lowest score of class : ", minimum(list))

# Count of students who were absent for the test
dict = list_to_dict(list)
print("Count of students who were absent for the test : ", dict[0])

# Display mark with highest frequency
frequency = list_to_dict(list)
p = max_frequency(frequency)
print("Mark's with highest frequency is {} and its frequency is {}
".format(p,frequency[p]))
```

Output :

```
The average score of class :  64.96551724137932
Highest score of class :  99
lowest score of class :  13
Count of students who were absent for the test :  5
Mark's with highest frequency is 90 and its frequency is 3
```

Time Complexity :

sr no.	Function	Time Complexity
1	**list_to_dict**	**O(n)**

2	mean	O(n)
3	minimum	O(n)
4	maximum	O(n)
5	max_frequency	O(1)
6	print	O(1)

Total Time Complexity:= O(n)

Conclusion :-

Thus we have studied one dimensional array and used for performing various operations like ,The average score of class , Highest score and lowest score of class , Count of students who were absent for the test , Display mark with highest frequency

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