Modern Education Society's
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DATE OF PERFORMANCE:	**DATE OF SUBMISSION: 15/12/2021**
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TITLE : SORTING OPERATIONS

PROBLEM STATEMENT : Write a **Python** program to store first year percentage of students in array. Write function for sorting array of floating point numbers in ascending order using

a) Selection Sort
b) Bubble sort and display top five scores.

OBJECTIVES :

1. To understand structure of Array.
2. To understand how to sort elements of given array.

OUTCOME :

1. To operate on the various structured data.
2. To analyze the problem to apply suitable algorithm and data structure.

PRE-REQUISITES :

1. Knowledge of Python Programming
2. Knowledge of sorting methods and array.

APPARATUS :

QUESTIONS : 1. Explain Merge sort with example and write C++ program for same.

PROGRAM:

```
# Function for Selection Sort of elements

def Selection_Sort(marks):
    for i in range(len(marks)):

        # Find the minimum element in remaining unsorted array
        min_idx = i
        for j in range(i + 1, len(marks)):
            if marks[min_idx] > marks[j]:
                min_idx = j

        # Swap the minimum element with the first element
        marks[i], marks[min_idx] = marks[min_idx], marks[i]

    print("Marks of students after performing Selection Sort on the list : ")
    for i in range(len(marks)):
        print(marks[i])

#<-------------------------------------------------------------------------------------------->

# Function for Bubble Sort of elements

def Bubble_Sort(marks):
    n = len(marks)
    # Traverse through all array elements
    for i in range(n - 1):
        # Last i elements are already in place
        for j in range(0, n - i - 1):

            # Traverse the array from 0 to n-i-1
            # Swap if the element found is greater than the next element
            if marks[j] > marks[j + 1]:
                marks[j], marks[j + 1] = marks[j + 1], marks[j]

    print("Marks of students after performing Bubble Sort on the list :")
    for i in range(len(marks)):
        print(marks[i])

#<-------------------------------------------------------------------------------------------->

# Function for displaying top five marks

def top_five_marks(marks):
    print("Top",len(marks),"Marks are : ")
    print(*marks[::-1], sep="\n")

#<-------------------------------------------------------------------------------------------->

# Main

marks=[]
n = int(input("Enter number of students whose marks are to be displayed : "))
print("Enter marks for",n,"students (Press ENTER after every students marks): ")
for i in range(0, n):
    ele = int(input())
    marks.append(ele)  # adding the element

print("The marks of",n,"students are : ")
print(marks)

flag=1;
while flag==1:
    print("\n---------------MENU---------------")
    print("1. Selection Sort of the marks")
```

```
    print("2. Bubble Sort of the marks")
    print("3. Exit")
    ch=int(input("\n\nEnter your choice (from 1 to 3) : "))

    if ch==1:
        Selection_Sort(marks)
        a=input("\nDo you want to display top marks from the list (yes/no) : ")
        if a=='yes':
            top_five_marks(marks)
        else:
            print("\nThanks for using this program!")
            flag=0

    elif ch==2:
        Bubble_Sort(marks)
        a = input("\nDo you want to display top five marks from the list (yes/no) : ")
        if a == 'yes':
            top_five_marks(marks)
        else:
            print("\nThanks for using this program!")
            flag = 0

    elif ch==3:
        print("\nThanks for using this program!!")
        flag=0

    else:
        print("\nEnter a valid choice!!")
        print("\nThanks for using this program!!")
        flag=0
```

OUTPUT:

```
FDS Q14
C:\Users\sspab\PycharmProjects\new\venv\Scripts\python.exe "C:/Users/sspab/PycharmProjects/new/sem  3/FDS Q14.py"
Enter number of students whose marks are to be displayed : 6
Enter marks for 6 students (Press ENTER after every students marks):
12
44
88
75
33
22
The marks of 6 students are :
[12, 44, 88, 75, 33, 22]

----------MENU----------
1. Selection Sort of the marks
2. Bubble Sort of the marks
3. Exit


Enter your choice (from 1 to 3) : 1
Marks of students after performing Selection Sort on the list :
12
22
33
44
75
88

Do you want to display top marks from the list (yes/no) : yes
Top 6 Marks are :
88
75
44
33
22
12
```