Department : Computer Engineering

Class : SE

Subject : Data Structure Lab

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Batch: H4

Assignment No : 06

- **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 quick sort and display top five scores.

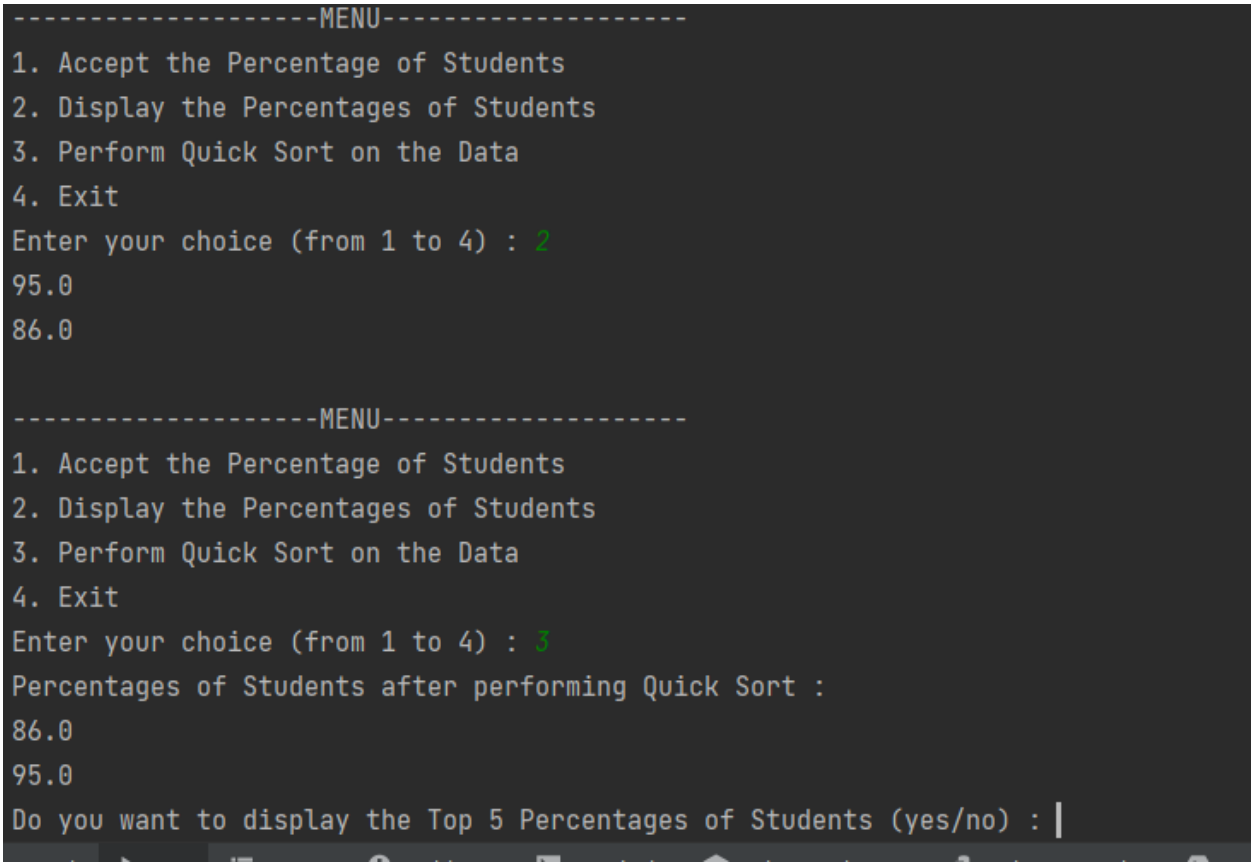
```
definput_percentage():
    perc = []
number_of_students = int(input("Enter the number of Students : "))
for iin range(number_of_students):
perc.append(float(input("Enter the percentage of Student {0} : ".format(i+1))))
return perc


# Function for printing the percentage of the Students
defprint_percentage(perc):
for iin range(len(perc)):
print(perc[i],sep= "\n")


# Function for performing partition of the Data
defpercentage_partition(perc,start,end):
    pivot = perc[start]
lower_bound = start + 1
upper_bound = end

while True:
while lower_bound<= upper_boundand perc[lower_bound] <= pivot:
lower_bound += 1

while lower_bound<= upper_boundand perc[upper_bound] >= pivot:
```

```
upper_bound -= 1

if lower_bound<= upper_bound:
            perc[lower_bound],perc[upper_bound] = perc[upper_bound],perc[lower_bound]

else:
break


perc[start],perc[upper_bound] = perc[upper_bound],perc[start]

return upper_bound


# Function for Displaying Top Five Percentages of Students
defdisplay_top_five(perc):
print("Top Five Percentages are : ")
if len(perc) <5:
        start, stop = len(perc) - 1, -1
else:
        start, stop = len(perc) - 1, len(perc) - 6

for iin range(start, stop, -1):
print(perc[i],sep= "\n")


# Function for performing Quick Sort on the Data
class sort:
defQuick_Sort(self,perc, start, end):
while start < end:
            partition = percentage_partition(perc, start, end)
self.Quick_Sort(perc, start, partition - 1)
self.Quick_Sort(perc, partition + 1, end)
return perc

# Main
unsorted_percentage = []
sorted_percentage = []
flag = 1
S1 = sort()
while flag == 1:
print("\n--------------------MENU--------------------")
print("1. Accept the Percentage of Students")
print("2. Display the Percentages of Students")
print("3. Perform Quick Sort on the Data")
print("4. Exit")

ch = int(input("Enter your choice (from 1 to 4) : "))
```

```
if ch == 1:
unsorted_percentage = input_percentage()

elifch == 2:
print_percentage(unsorted_percentage)

elifch == 3:
print("Percentages of Students after performing Quick Sort : ")
sorted_percentage = S1.Quick_Sort(unsorted_percentage,0,len(unsorted_percentage)-1)
print_percentage(sorted_percentage)
        a = input("Do you want to display the Top 5 Percentages of Students (yes/no) : ")
if a == 'yes':
display_top_five(sorted_percentage)

elifch == 4:
print("Thanks for using this program!!")
flag = 0

else:

print("Invalid Choice!!")
```

- **Output:**

```
--------------------MENU--------------------
1. Accept the Percentage of Students
2. Display the Percentages of Students
3. Perform Quick Sort on the Data
4. Exit
Enter your choice (from 1 to 4) : 1
Enter the number of Students : 2
Enter the percentage of Student 1 : 95
Enter the percentage of Student 2 : 86

--------------------MENU--------------------
1. Accept the Percentage of Students
2. Display the Percentages of Students
3. Perform Quick Sort on the Data
4. Exit
Enter your choice (from 1 to 4) : 2
95.0
86.0
```


--------------------MENU--------------------
1. Accept the Percentage of Students
2. Display the Percentages of Students
3. Perform Quick Sort on the Data
4. Exit
Enter your choice (from 1 to 4) : 2
95.0
86.0
--------------------MENU--------------------
1. Accept the Percentage of Students
2. Display the Percentages of Students
3. Perform Quick Sort on the Data
4. Exit
Enter your choice (from 1 to 4) : 3
Percentages of Students after performing Quick Sort :
86.0
95.0
Do you want to display the Top 5 Percentages of Students (yes/no) :