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Exam seat no:

Roll no: SE 265

Batch no: B1

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**ASSIGNMENT NO : 07**

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.

import array as arr

# Accept the % marks of the students

def accept\_perc():

a = arr.array('f', [])

no\_stud = int(input("Enter the number of Students : "))

for i in range(0, no\_stud):

a.append(float(input("Enter the First Year % of Student[{0}] : ".format(i))))

return a

# Print the % marks of the Students

def print\_perc(a):

for i in range(0, len(a)):

print("\t {0:.2f}".format(a[i]), end=" ")

print()

# Quick Sort Partition functio

def partition(a, start, end):

pivot = a[start]

low = start + 1

high = end

while True:

while low <= high and a[high] >= pivot:

high = high - 1

# Opposite process of the one above

while low <= high and a[low] <= pivot:

low = low + 1

# We either found a value for both high and low that is out of order

# or low is higher than high, in which case we exit the loop

if low <= high:

a[low], a[high] = a[high], a[low]

# The loop continues

else:

# We exit out of the loop

break

a[start], a[high] = a[high], a[start]

return high

# Quick Sort function

def quick\_sort(a, start, end):

if start >= end:

return

p = partition(a, start, end)

quick\_sort(a, start, p - 1)

quick\_sort(a, p + 1, end)

return a

# Top 5 Score

def top\_five(a):

print("Top five score are : ")

cnt = len(a)

if cnt < 5:

start, stop = cnt - 1, -1 # stop set to -1 as we want to print the 0th element

else:

start, stop = cnt - 1, cnt - 6

for i in range(start, stop, -1):

print("\t {0:.2f}".format(a[i]), end=" ")

# Driver program

if \_\_name\_\_ == "\_\_main\_\_":

unsort\_A = arr.array('f', [])

quick\_sort\_A = arr.array('f', [])

flag = 1

while flag == 1:

print("\n 1. Accept array elements \n 2. Display the Elements \n 3. Quick Sort \n 4. exit")

choice = int(input("Enter your choice : "))

if choice == 1:

unsort\_A = accept\_perc()

elif choice == 2:

print\_perc(unsort\_A)

elif choice == 3:

print("Elements after sorting using Insertion Sort :")

quick\_sort\_A = quick\_sort(unsort\_A, 0, len(unsort\_A) - 1)

print\_perc(quick\_sort\_A)

top\_five(quick\_sort\_A)

else:

print("Wrong choice")

flag = 0

**Output:**

1. Accept array elements

2. Display the Elements

3. Quick Sort

4. exit

Enter your choice: 1

Enter the number of Students: 5

Enter the First Year % of Student [0]: 98

Enter the First Year % of Student [1]: 84

Enter the First Year % of Student [2] : 75

Enter the First Year % of Student [3]: 79

Enter the First Year % of Student [4]: 80

1. Accept array elements

2. Display the Elements

3. Quick Sort

4. exit

Enter your choice : 2

98.00 84.00 75.00 79.00 80.00

1. Accept array elements

2. Display the Elements

3. Quick Sort

4. exit

Enter your choice : 3

Elements after sorting using Insertion Sort :

75.00 79.00 80.00 84.00 98.00

Top five score are :

98.00 84.00 80.00 79.00 75.00

1. Accept array elements

2. Display the Elements

3. Quick Sort

4. exit

Enter your choice: 4