Assignment No 4

#Accepting roll numbers :

def Accept\_roll():

 rollnum=[]

 numstud=int(input("Enter the number of students : "))

 for i in range(numstud):

  rollnum.append(int(input("Enter the roll number of student {0}: ".format(i+1))))

 return rollnum

#Display of roll numbers :

def Display\_roll(rollnum):

 for i in range(len(rollnum)):

   print(rollnum[i],sep= "\n")

#Sorting the given roll numbers :

def Sort(rollnum):

 for i in range(1,len(rollnum)):

  key=rollnum[i]

  j=i-1

  while rollnum[j]>key and j>=0:

   rollnum[j+1]=rollnum[j]

   j-=1

   rollnum[j+1]=key

 return rollnum

#Searching through el using Ternary\_Search :

def recTernary\_search(roll,left,right,findroll):

 if (right >= left):

  mid1 = left + (right - left) // 3

  mid2 = mid1 + (right - left) // 3

  if (roll[mid1] == findroll):

   return mid1

  if (roll[mid2] == findroll):

   return mid2

  if (findroll< roll[mid1]):

   return recTernary\_search(roll, left, mid1 - 1, findroll)

  elif (findroll > roll[mid2]):

   return recTernary\_search(roll, mid2 + 1, right, findroll)

  else:

   return recTernary\_search(roll, mid1 + 1, mid2 - 1, findroll)

 return -1

#main

unsort\_Roll = []

sort\_Roll = []

flag = 1

while flag == 1:

        print("\n+---------------------MENU---------------------+")

        print("1. Accept Student Roll Numbers")

        print("2. Display the Roll Numbers of Student")

        print("3. Sort Roll Numbers from the list")

        print("4. Perform Recursive Ternary Search")

        print("5. Exit\n")

        ch = int(input("Enter your choice (from 1 to 6) : "))

        if ch == 1:

             unsort\_Roll = Accept\_roll()

        elif ch == 2:

            Display\_roll(unsort\_Roll)

        elif ch == 3:

            print("Elements after performing Insertion Sort : \n")

            sort\_Roll = Sort(unsort\_Roll)

            Display\_roll(sort\_Roll)

        elif ch == 4:

            findroll = int(input("Enter the Roll Number to be searched : "))

            roll=sort\_Roll

            left=0

            right=len(sort\_Roll)-1

            index = recTernary\_search(roll,left,right,findroll)

            if index != -1:

                 print("The Roll Number",findroll,"is found at position",index+1)

            else:

                 print("Roll Number",findroll,"not found!!")

        elif ch == 5:

            print("Thanks for using this program!!")

            flag=0

        else:

            print("Wrong choice!!")

            flag = 0

Output :

+---------------------MENU---------------------+

1. Accept Student Roll Numbers

2. Display the Roll Numbers of Student

3. Sort Roll Numbers from the list

4. Perform Recursive Ternary Search

5. Exit

Enter your choice (from 1 to 6) : 1

Enter the number of students : 5

Enter the roll number of student 1: 41

Enter the roll number of student 2: 31

Enter the roll number of student 3: 77

Enter the roll number of student 4: 55

Enter the roll number of student 5: 99

+---------------------MENU---------------------+

1. Accept Student Roll Numbers

2. Display the Roll Numbers of Student

3. Sort Roll Numbers from the list

4. Perform Recursive Ternary Search

5. Exit

Enter your choice (from 1 to 6) : 2

41

31

77

55

99

+---------------------MENU---------------------+

1. Accept Student Roll Numbers

2. Display the Roll Numbers of Student

3. Sort Roll Numbers from the list

4. Perform Recursive Ternary Search

5. Exit

Enter your choice (from 1 to 6) : 3

Elements after performing Insertion Sort :

31

41

55

77

99

+---------------------MENU---------------------+

1. Accept Student Roll Numbers

2. Display the Roll Numbers of Student

3. Sort Roll Numbers from the list

4. Perform Recursive Ternary Search

5. Exit

Enter your choice (from 1 to 6) : 4

Enter the Roll Number to be searched : 41

The Roll Number 41 is found at position 2

+---------------------MENU---------------------+

1. Accept Student Roll Numbers

2. Display the Roll Numbers of Student

3. Sort Roll Numbers from the list

4. Perform Recursive Ternary Search

5. Exit

Enter your choice (from 1 to 6) : 5

Thanks for using this program!!