Group B-13:--- Kaustubh Shrikant Kabra SE COMP-1 20

Program:-

*"""  
Write a python program to maintain club members, sort on roll numbers   
in ascending order. Write function “Ternary\_Search” to search   
whether particular student is member of club or not.   
Ternary search is modified binary search that divides   
array into 3 halves instead of two.  
"""*import array as arr  
  
def Ternary\_Search(arr,ele):  
 left=0  
 right=len(arr)-1   
 while(left<=right):  
 mid1=left+(right-left)//3  
 mid2=left+2\*(right-left)//3  
   
 if(ele==arr[left]):  
 return left  
 elif(ele==arr[right]):  
 return right  
 elif(ele<arr[left] or ele>arr[right]):  
 return -1  
 elif(ele<=arr[mid1]):  
 right=mid1  
 elif(ele>=arr[mid2]):  
 left=mid2  
 elif(ele>arr[mid1] and ele<arr[mid2]):  
 left=mid1+1  
 right=mid2-1  
 return -1  
   
def Recursive\_Ternary(arr,ele,left,right):  
   
 if(left<=right):  
 mid1=left+(right-left)//3  
 mid2=right-(right-left)//3   
 if(ele==arr[mid1]):  
 return mid1  
 if(ele==arr[mid2]):  
 return mid2  
   
 if(ele<arr[mid1]):  
 return Recursive\_Ternary(arr, ele, left, mid1-1)  
 elif(ele>arr[mid2]):  
 return Recursive\_Ternary(arr, ele, mid2+1, right)  
 else:  
 return Recursive\_Ternary(arr, ele, mid1+1, mid2-1)  
 return -1  
  
def accept():  
 A=arr.array('I',[])  
 n=int(input("Enter number of students: "))  
 for i in range(0,n):  
 A.append(int(input("Enter roll number: ")))  
 return A  
  
def display(A):  
 for i in range(0, len(A)):  
 print("\t", A[i], end=" ")  
 print()  
  
def sel\_sort(A):  
 for i in range(len(A)):  
 for j in range(i+1,len(A)):  
 if(A[j]<A[i]):  
 temp=A[i]  
 A[i]=A[j]  
 A[j]=temp  
 return A  
  
A=arr.array('I',[])  
sort\_A=arr.array('I',[])  
  
while True:  
   
 print("\n1)Accept roll number \n2)Print roll number \n3)sort roll numbers\n4)Non-recursive Ternary Search \n5)Recursive Ternary Search \n6)Exit")  
 ch=int(input("Enter your choice: "))  
   
 if(ch==1):  
 A=accept()  
   
 elif(ch==2):  
 display(A)  
   
 elif(ch==3):  
 sort\_A=sel\_sort(A)  
 print("The sorted roll numbers are:")  
 display(sort\_A)  
   
 elif(ch==4):  
 ele=int(input("Enter roll number to be searched: "))  
 r=Ternary\_Search(sort\_A, ele)  
 if(r==-1):  
 print("Roll number not found!!")  
 else:  
 print("The roll number", ele, "is present at index", r)  
 elif(ch==5):  
 ele=int(input("Enter roll number to be searched: "))  
 r=Recursive\_Ternary(sort\_A, ele, 0, len(sort\_A)-1)  
 if(r==-1):  
 print("Roll number not found!!")  
 else:  
 print("The roll number", ele, "is present at index", r)  
 elif(ch==6):  
 print("Thank you")  
 break  
 else:  
 print("Wrong choice")  
 break

Output:-

1)Accept roll number

2)Print roll number

3)sort roll numbers

4)Non-recursive Ternary Search

5)Recursive Ternary Search

6)Exit

Enter your choice: 1

Enter number of students: 7

Enter roll number: 16

Enter roll number: 17

Enter roll number: 18

Enter roll number: 20

Enter roll number: 25

Enter roll number: 78

Enter roll number: 69

1)Accept roll number

2)Print roll number

3)sort roll numbers

4)Non-recursive Ternary Search

5)Recursive Ternary Search

6)Exit

Enter your choice: 2

16 17 18 20 25 78 69

1)Accept roll number

2)Print roll number

3)sort roll numbers

4)Non-recursive Ternary Search

5)Recursive Ternary Search

6)Exit

Enter your choice: 3

The sorted roll numbers are:

16 17 18 20 25 69 78

1)Accept roll number

2)Print roll number

3)sort roll numbers

4)Non-recursive Ternary Search

5)Recursive Ternary Search

6)Exit

Enter your choice: 4

Enter roll number to be searched: 20

The roll number 20 is present at index 3

1)Accept roll number

2)Print roll number

3)sort roll numbers

4)Non-recursive Ternary Search

5)Recursive Ternary Search

6)Exit

Enter your choice: 5

Enter roll number to be searched: 20

The roll number 20 is present at index 3

1)Accept roll number

2)Print roll number

3)sort roll numbers

4)Non-recursive Ternary Search

5)Recursive Ternary Search

6)Exit

Enter your choice: 6

Thank you