* Data Structure Lab (DSL) - Practical Number - 4. (Group - B)

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Title :-
Write a python program to perform ternary search.

Aim :-
Write a python program to maintain club members, sort on roll number 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.

Objective :-
To understand and implement ternary search in python.

Theory :-
Ternary search is a divide and conquer algorithm that can be used to find an element in an array. It is similar to binary search where we divide the array into two parts but in this algorithm, we divide the array into three parts and determine which has the key.

Steps to perform Ternary Search:-

1) First, we compare the key with the element at mid1. If found equal, we return mid1.

2) If not, then we compare the key with the element at mid2. If found equal, we return mid2.

3) If not, then we check whether the key is less than element at mid1. If yes, then we recur to first half of array.

4) If not, then we check whether the key is greater than the element at mid2. If yes, then we recur to third half of array.

5) If not, then we recur to the second half of the array.

Algorithm:-

Step1 - Start

Step2 - Display menu to user and accept his choice.

Step3 - If user enter 1, accept the roll number in an array.

Step4 - If user enter 2, then display the roll number.

Step5 - If user enter 3, then sort the roll numbers using selection sort and store the sorted roll number in another array.

Step 6 - If user enter 4, then accept the roll number to be searched

Step 7 - Search the roll number in the sorted array using non recursive sear

Step 8 - Display the index of the roll number if found.

Step 9 - If user enters 5, then accept the roll number to be searched.

Step 10 - Search the roll number in the sorted array using recursive ternary search.

Step 11 - Display the index of the roll number if found.

Step 12 - Go to step 2 if user wants to continue.

Step 13 - Stop

Analysis :-

The time complexity of Ternary Search is $O(\log_3^n)$.

Conclusion :-

Hence, we have performed ternary search in an array.