

## LAB Practice Question

Q1. You are part of a team of explorers on a thrilling expedition in the majestic Peak Valley, known for its stunning mountain ranges. Each mountain's height is represented in an array, where each element signifies the elevation of a specific point.

During your adventure, you and your team are searching for the highest peaks to plant flags and mark your achievements. A peak is defined as a point that is taller than both of its neighboring points. Your mission is to identify one such peak so that your team can celebrate and take a memorable photo.

**Given an array  $A$  of length  $N$ , where each element represents the height of a point in the mountain range, write a program to find the index (0-based) of any peak element. If multiple peaks exist, returning the index of any one of them will suffice.**

**Also the first and last element of the array will not be counted as peak element. As they are present at the boundary.**

**Example:**

Input:  $A = [1, 3, 20, 4, 5, 6, 7, 3, 2]$

Possible Outputs:

index 2 (since  $A[2] = 20$  is greater than its neighbors  $A[1] = 3$  and  $A[3] = 4$ )

index 6 (since  $A[6] = 7$  is greater than its neighbors  $A[5] = 6$  and  $A[7] = 3$ )

**So any of them can be returned as peak,would be correct answer.**

**Evaluation :**

Wrong output: Zero marks

Time Complexity:-

Bruteforce Solution:  $O(N)$  Half marks

Optimal Solution:  $O(\log N)$  Full marks