AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY UNDER SECTION 3 OF UGC ACT, 1956

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AMC FOSS CLUB

Practice Questions - 4

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1. Given an array **arr[]** of integers. Find a peak element i.e. an element that is **not smaller** than its neighbors.

   Input: arr[]={5,10,20,15}

   Output: 20

   Explanation: The element 20 has neighbors 10 and 15, both of them are less than 20.

   Note: For corner elements, we need to consider only one neighbor.
   If all elements of the input array are the same, every element is a peak element.

2. Given an array **A[]** consisting of only **0s**, **1s,** and **2s**. The task is to write a function that sorts the given array. The functions should put all 0s first, then all 1s and all 2s in last.

   Input: {0, 1, 1, 0, 1, 2, 1, 2, 0, 0, 0, 1}

   Output: {0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 2, 2}

   Constraints: The expected time complexity is O(N). You can't use any inbuilt sorting functions.

3. Find the majority element in the array. A **majority element** in an array A[] of size n is an element that appears more than n/2 times.

   Input : A[]={3, 3, 4, 2, 4, 4, 2, 4,4}

   Output : 4

   Explanation: The frequency of 4 is 5 which is greater than the half of the size of the array.

   Constraints: The expected time complexity is O(N).

4. Given an array **arr[]** of size N, the task is to sort this array in descending order

   Input: arr[] = {0, 23, 14, 12, 9}

Output: {23, 14, 12, 9, 0}

Constraints: Don't use any inbuilt functions.

5. Find the factorial of a large number. A factorial of a number like 100 has 158 digits. It is not possible to store these many digits even if we use long int. So try using array to solve the problem.

   Input: 100

   Output: 933262154439441526816992388562667004-
   907159682643816214685929638952175999-
   932299156089414639761565182862536979-
   208272237582511852109168640000000000-
   00000000000000