## Problems for the Today [16-08-2024]

1. Suppose you have an unsorted array A of all integers in the range 0 to n except for one integer, denoted the missing number. Assume that $n = 2^k - 1$. Design and implement O(n) Divide and Conquer algorithm to find the missing number.
2. Design and implement a divide and conquer algorithm to count the number of inversions.
3. Suppose you are given an array X of m integers, devise an efficient algorithm to find the sum of the total number of inversions in all sub-arrays of X of length l.

**INSTRUCTIONS:**

- All the programs should be stored in a folder by the name " YOUR ROLL NUMBER" (All letters in the roll number should be in caps).
- It should be uploaded through Moodle.
- The test cases are provided along with the problems.