Suggested Questions on Week 2 Lecture

1. **Missing Numbers:** An Array has numbers from 1 to n (unordered). There are some missing numbers in the array. Print the missing numbers.
   Inputs to Function:
   n – highest integer of the array
   Array elements separated by space
   Output Format:
   Numbers missing in the array separated by space or one after the other.
   Test Cases:
   Input:-
   10
   1 2 3 4 6 7 8 9 10
   Output:-
   5

   Input:-
   10
   1 2 4 5 6 7 9 10
   Output:-
   3 8

   Input:-
   6
   1 2 4 5 6
   Output:-
   3

   Concepts tested: Use of data types, Space and Time complexity, Edge test cases

2. **Find Range:** Given an unordered array of integers find the range of values in the array.
   Input to Function:
   n – size of array
   Array elements separated by space
   Output Format:
   Range of Values
   Test Cases:
   Input:-
   5
   10 8 6 1 7
   Output:-
   9

   Input:-
   10
   1 8 2 9 4 5 10 5 6 12
   Output:-

11

Input:-
8
5 2 10 15 8 4 2 6
Output:-
13

Concepts tested: Time Complexity, Implementation of GetMaximum and GetMinimum functions from textbook.

3. **Find Missing Number(Sorted Array):** You are given a sorted array of integers from 1 to n. There is one missing number in the array. Find the missing number. The obvious solution is to go through all the elements and find the missing element. We can however do it faster. Think how can we reduce the runtime of the function.
   Input to Function:
   Array elements
   Output:
   Missing element
   Test Cases:
   Input:-
   1 2 3 4 5 7 8 9 10
   Output:-
   6

   Concepts tested: Binary Search

4. **Find Second Maximum Number and Second Minimum Number:** Given an unordered array of n integers find the second maximum and second minimum number in the array. If there are more than two instances of the greatest number in the array then look for the number that is smaller than them for the second maximum. Similarly for the second minimum. If all the numbers in the array are the same then the second maximum and second minimum function should yield “NULL” as a result.
   Input to Function:
   Array elements separated by space
   Output:
   Second Max: x
   Second Min: y
   Test Cases
   Input:-
   1 2 4 8 7 6 3 5 9 10
   Output:-
   Second Max: 9
   Second Min: 2

   Input:-
   1 1 2 3 5 8 9 6 7
   Output:-

Second Max: 8
Second Min: 2

Input:-
2 2 2 2 2 2 2 2 2 2
Output:-
Second Max: NULL
Second Min: NULL

Concepts tested: Edge Cases Handling, Array traversal, Variation of getMax and getMin from textbook

5. **First Non Repeating character in a string:** Strings can be thought of as character arrays. With that thought in mind if you are given a String (all lowercase letters), find the first non-repeating character in the String(character array). First non-repeating character means if there are more than one non repeating character in the array you return which comes first in the array. If there are no repeating characters then return "NULL".
   Input to Function:
   String to be checked

   Output:
   First non-repeating character
   Test Cases:
   Input:-
   computerengineer
   Output:-
   c

   Input:-
   electricalengineer
   Output:-
   t

   Input:-
   anna
   Output:-
   NULL

   Concepts tested: Data types, Array traversal, Access Properties of an Array, Object Array.