Top-20 Training Program
(Data Structures)
Assignment-1

1) Given an array that contains some number of contiguous zeroes at the start, followed by some arbitrary integers other than zero. Write an efficient function that returns the number of zeroes in the given array.
Function Prototype:
int countZeroes(int []a, int n)

Input: 0 0 0 0 0 3 2 8 11 10 15 22
Output: 5

2) Given an array of n integers which contains all elements from 0 to n except one. Write an efficient function to find that number. Your solution should not result in overflow. What are the time and space complexities of your solution?
Function Prototype:
int findMissing(int []a, int n)

3) Write an efficient function that prints a 2-D (n x n) array in spiral order. Your function should cover all the elements in the given array.
Function Prototype:
void printSpiralWay(char [][]a, int n)

Input: a b c
1 2 3
p q r
Output: a b c 3 r q p 1 2

4) The array T represents the diameters of various teacups, and the array S, the diameters of saucers, both the arrays sorted in non-decreasing order. The 'i'th cup (whose diameter is T[i]) can be paired with the 'j'th saucer (whose diameter is S[j]) if and only if S[j] >= T[i]. Given the sorted arrays 'S' and 'T', write an efficient 'C' function

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which would return the maximum number of cup and saucer pairings possible for given arrays ‘S’ and ‘T’.
Function Prototype:
int getMaxNumberOfPairs(int[] T, int[] S, int no_cups, int no_saucers)

Input: T = {15, 20, 20, 22, 30} and S = {10, 19, 26, 30}
Output: 3
([15,19], [20,26], [30,30] for instance)