SUNTEK
Corp Solutions Pvt. Ltd.
Intellect Meets Aspiration

Assignment Questions for Batch 1

Topics: Recursion, Arrays, Searching & Matrix

Submission Day: Sun, 22nd Sep, 2019

To be Submitted in: Github

Recursion

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1) **Program for Fibonacci Series of given input number, should work for any kind of input.**

2) **Program for factorial of given number , should work for any kind of input.**

Should write

a) Recursive program for O(2^n)
b) Recursive prog with memorization.
c) Iterative

3) **Program for pow(x,n) (x^n) using recursive and iterative approach.**

4) **Program for x^n Mod M (Modular Exponentiation) using recursive and iterative approach.**

5) Program to find given prime no or not using recursive and iterative approach and memory efficient approach.

Arrays & Searching & Matrix

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1) **Find the contiguous subarray within an array (containing at least one number) which has the largest sum.**

Eg : Given the array [-2,1,-3,4,-1,2,1,-5,4], the contiguous subarray [4,-1,2,1] has the largest sum = 6.

2) **Give a N*N square matrix, return an array of its diagonals**

3) **Given an unsorted integer array, find the first missing positive integer.**

Example: Given [1,2,0] return 3, [3,4,-1,1] return 2, [-8, -7, -6] returns 1
Your algorithm should run in O(n) time and use constant space.

4) **Given an unsorted integer array, find the first repetitive positive integer.**

Example: Given [1,2,3,4,3] return 3

Your algorithm should run in O(n) time and use constant space.

5) **You are given a read only array of n integers from 1 to n.**
Each integer appears exactly once except A which appears twice and B which is missing.
Return A and B.

Note: Your algorithm should have a linear runtime complexity. Could you implement it without using extra memory?

Note that in your output A should precede B.

Example: Input:[3 1 2 5 3] Output:[3, 4] A = 3, B = 4