Easy Medium Problems

Nov 18.2017

Please pair with someone who programs in the same language as you.

A. Easy Medium Conceptual Problems – 20 points

a. Briefly describe the most interesting or challenging bug you've fixed. What was its root cause?

b. Have you heard of Test Driven Development? If so, what is it, what are its pro's and con's? What's your experience with it?

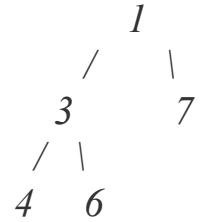
c. Do you practice code-reviews on your peer's work? Briefly describe what's worked well for you when doing code-reviews for others, and what hasn't worked?

d. How are you improving as a software engineer? What's worked and hasn't worked?

A. Easy Medium – 20 points

Given a binary tree with nodes containing natural numbers. Assume the numbers are 16 bit integers. Write a function that prints all the nodes in the tree that are fibonacci numbers. The fibonacci sequence is 0,1,1,2,3,5,8,13,21,etc. The optimal solution should run in O(n) when n is the number of nodes in a tree, with a one-time processing step of O(k) where k is number of fibonacci numbers in a 16 bit integer. The solution's order is unimportant.

Example:



prints: 1 3

B. Easy Medium – 10 points

Write a function that finds the top 2 elements in an unsorted array. It should run in O(n) time when n is the number of elements in the array.

i.e. *3,1,4,1,5,9 → 5,9*
0,0,7,7,3,3,1,1 →7,7
1 → 1,1
0,0 → 0,0

D. Easy Medium – 20 points

Given an unsorted array of numbers, write a function that prints all the pairs of unique numbers that add up to K. The optimal solution should run in O(n) time where n is the number of elements in the array.

Ex: let A= [3,1,4,1,5,9,2,6,5,6]
pairs(A, 5) → [(3,2),(1,4)]
pairs(A, 3) → [(1,2)]
pairs(A, 12) → [ ] // because (6,6) doesn't count, each number must be unique

D. Easy Medium – 30 points

Suppose you're designing a Ms.PacMan game. Create an object-oriented skeleton class structure for the different elements in the game.

F. Easy Medium – 30 points

Given a binary tree write a method that will delete a node from the tree. It should cover all cases.