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Amazon Interview | Set 89

- Difficulty Level :\nMedium
- Last Updated :\n08 Feb, 2022

Online round:
1) Program to check if two rectangles overlap.
2) Program to find if a given string, say S, contains another given string, say P.
3) Write a program to check if the coins can be summed up to a given number, if yes print the coins that sums upto the given sum.

Telephonic round:
1) Given a singly linked list, modify the value of first half nodes such that 1st node\xe2\x80\x99s new value is equal to the last node\xe2\x80\x99s value minus first node\xe2\x80\x99s current value, 2nd node\xe2\x80\x99s new value is equal to the second last node\xe2\x80\x99s value minus 2nd node\xe2\x80\x99s current value, likewise for first half nodes.

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 \r\n  Ex: \r\n  1) 1 -> 2 -> 3 -> 4 -> 5 -> 6 -> 7\r\n  Modified list: \r\n  6(7-1) -> 4(6-2) -> 2(5-3) ->0(4-4) -> 5
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2) Reverse the alternate level nodes of the binary tree.

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\r\nEx: Given tree: \r\n               a\r\n            /     \\\r\n           b       c\r\n         /  \\     /  \\\r\
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Face to Face Rounds:
Round 1:
\xe2\x80\xa2 Thorough discussion about one project that I considered as the most interesting or challenging.
\xe2\x80\xa2 Suppose we need a service to perform certain task every day at some specified time. How do we ensure that everyday at the specified time the service will do that task?
\xe2\x80\xa2 Design a stack that supports push, pop, and retrieving the minimum element in constant time.
\xe2\x80\xa2 Program to get the maximum distance between two nodes in the binary tree. The interviewer further generalized this problem for n-ary tree. Then he asked how to get the longest path in a graph.

Round 2:
\xe2\x80\xa2 What happens when we enter the url in the browser?
\xe2\x80\xa2 Difference between inner join and outer join.
\xe2\x80\xa2 How does the garbage collector works in java?
\xe2\x80\xa2 Questions on stacks and heaps(memory management).
\xe2\x80\xa2 We have n gold coins. We need to amalgamate all the n coins to create one single coin, we can merge two coins at once. The cost of merging two coins is equal to the value of those coins. How do we ensure that the cost of merging n coins in minimum.
Ex: 5 ,8 , 4, 3, 9, 6
We will merge 3 and 4, cost=7 {Remaining coins: 5,8,9, 6,7}
Then we merge 5 and 6, cost=11 { Remaining coins: 11,8,9,7}
Then we merge 7 and 8, cost=15 { Remaining coins: 11,15,9}
Then we merge 9 and 11, cost=20 { Remaining coins: 20,15}
Then we merge 20 and 15, cost=35 { Remaining coins: 35}
Total cost: 7+11+15+20+35 = 88

If we had merged the coin array {5, 8, 4, 3, 9, 6} in different fashion:
Merging 5 and 8, cost=13 {Remaining coins: 13, 4, 3, 9, 6}
Merging 13 and 4, cost=17 {Remaining coins: 17, 3, 9, 6}
Merging 17 and 3, cost=20 {Remaining coins: 20, 9, 6}
Merging 20 and 9, cost=29 {Remaining coins: 29, 6}
Merging 29 and 6, cost=35 {Remaining coins: 35}
Total cost: 114

As we can see that the cost is less in the first case. Program to get the minimum cost of merging all the n coins.

\xe2\x80\xa2 Replace BST nodes with the sum of nodes greater than or equal to the node.

Round 3 (Hiring Manager):
\xe2\x80\xa2 Detailed discussion of my work in the current company.
\xe2\x80\xa2 Some behavioural questions like how do you handle certain situations etc.
\xe2\x80\xa2 Design a restaurant reservation system. I was also asked to write some sql queries in this regard.

Round 4 (Bar Raiser):
\xe2\x80\xa2 Given a linked list, write a function to reverse every k nodes (where k is an input to the function).
\xe2\x80\xa2 Given a sorted array which may contain duplicates, write a method to find the starting and the ending index of the given number if present.
Suppose we are give array: 1,2,2,2,5,6,6,9,10,10,10
If the number given is 9 then starting index and the ending index will be 7.
If the number given is 2 then the starting index will be 1 and the ending index will be 3.
If the number given is 7 the starting and the ending index will be -1 as the number is not present in the array.
\xe2\x80\xa2 Write a method to compress a given string \xe2\x80\x9caabbbccc\xe2\x80\x9d to \xe2\x80\x9ca2b3c3\xe2\x80\x9d . It should be an inplace compression, no extra space to be used.
\xe2\x80\xa2 Discussion about my current project.
\xe2\x80\xa2 Describe a scenario when you failed, when you helped our colleague etc.

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