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## Amazon Interview Experience | 198 (For SDE1)

- Difficulty Level : [Expert](#)
- Last Updated : 27 Jul, 2015

I have recently attended an interview with Amazon Hyderabad, for SDE-I position. All 4 rounds are conducted by different people from different teams.

There are 4 rounds in total.

1st and 2nd are on DS, Algos, PS

3rd is partially coding and partially design round

4th is managerial round.

Here are the questions that are asked in each interview:

### 1st Round:

1. What are the traversals required to serialize and deserialize a binary tree?

And what about for BST?

Given InOrder and Post Order of a binary tree, construct the original tree back. Write the code.

2. From a large stream of integers coming continuously, Find the k smallest elements always at any particular time?

3. There is a Binary Tree.

Now you have to replace each node's data with the sum of its left and right child's data.

But the condition is that:

You should replace the node's data with sum, only if the sum > data

If the sum < data, then keep some value on the node and adjust its left and right child's accordingly.

For eg: node=20, left=4, right = 6. Now sum = 10. Since 20 > 10, you should not replace.

Instead keep the node's data as it is and replace left data as (20-6)=14.

Now root=20, left = 14, right=6. Now check the condition again from left, till you reach leaf nodes.

### 2nd Round:

1. Given a set of strings. We are required to merge all these strings into a single string.

You are given with a merge(str1, str2) function, whose cost is sum of lengths of the strings passed.

How can you merge the strings, by making the cost as low as possible?

Write code of deleteMin, insert, percolateDown operations in Heap.

Solution:

Initially sort the strings in ascending order wrt their lengths. Now take out the first two strings and concatenate them.

Keep the resultant string in the sorted strings, wrt its length.

Priority Queue will be used to achieve the desired solution here.

2. Given a matrix of size m x n. Here m and n are very large, assume like 1 lakh.

You are given a series of submatrix inside this matrix. Find the sum of all elements inside each submatrix.

Submatrix positions are given in terms of its: top\_left\_cell and bottom\_right\_cell.

For eg:

input array: 5 x 6

1, 2, 3, 4, 5, 6  
7, 8, 9, 10, 11, 12  
13, 14, 15, 16, 17, 18  
19, 20, 21, 22, 23, 24  
25, 26, 27, 28, 29, 30

submatrix positions:

(3, 4), (4, 5)

which is

16, 17  
22, 23

o/p is: 78

**Solution:** Since there will be multiple submatrix will be given for your, its not optimum to go element by element for each submatrix. Do some pre-processing, like build another matrix same size as input matrix, which will contain sum of its sub matrix. This way we can calculate the sum in O(1) time.

For the above example, the sum matrix is:

1 2 3 4 5 6  
2 3 4 5 6 7  
3 4 5 6 7 8  
4 5 6 7 8 9  
5 6 7 8 9 10  
6 7 8 9 10 11

Now to find the sum of submatrix: (3, 4) and (4, 5)

sum = sum[maxRow, maxCol] - sum[minRow-1, maxCol] - sum[maxRow, minCol-1] + sum(minRow-1, minCol-1)

### 3rd Round:

1. Design a newspaper subscribing system for a user.

What are all the systems to be considered as part of this design?

2. There is a stream of integers coming. At any particular point of time, you are required to give the first non-repeated element from it.

For eg: 2, 3, 1, 2, 1, 3, 5

o/p: If I ask you at 2nd position(after 3), the answer is: 2

If I ask you at 5th position(after 1), the answer is: 3

If I ask you at 6th position(after 3), the answer is: No such element

If I ask you at 7th position(after 5), the answer is: 5

Solution:

Maintain a LinkedList, with the elements in insertion order  
maintain hashMap with input integer as key and value

Manager Round:

1. Google crawler question.

Given a set of N documents.

Given k strings: {str\_1, str\_2, ..., str\_k}

Now return the document numbers, which contains all the k strings.

2. Given an N-ary tree. Mirror the tree.

Give a suitable tree Node structure for this and write code for the same to mirror it.

eg:

1 2 3 4 5 6 7 8  
/ /  
2 3 4 5 6 7 8

I haven't done well in last two rounds. So I got rejected. But it was a nice experience altogether.

Thanks to geeksforgeeks for hell lot of questions. It takes at least a life time to prepare all the questions present in geeks for geeks, if we go by one question per day. Thanks.

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