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Microsoft Interview Experience | Set 56 (For SDE 2)

- Difficulty Level :\nExpert
- Last Updated :\n30 Jun, 2015

First Round (F2F) 1 hour:
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1. Given an image with a lot of pixels, find all the pairs of pixels that are strongly connected.

2. Given an N-ary tree with thousands of nodes, pair the leaf nodes which do NOT SHARE the common path. i.e. Two Leaves can be Paired only if they do NOT have a common edge that was used in a previous pairing.

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\r\nFor example, \r\n        A\r\n    /  |  \\\r\n   B   C   D\r\n /   / | \\\r\nE   F  G  H \r\nLeaf nodes: E, F, G, H
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Note: If we pair(join) say, (E-F) then we can NOT pair any of the (D-G) or (D-H) as they SHARE the COMMON path from A to C.

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\r\ni.e. E-B-A-C-F \xe2\x80\x94> (E-F) pair\r\n        D-A-C-G \xe2\x80\x94> (D-G) pair\r\n        D-A-C-H \xe2\x80\x94>
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So the above case is NOT possible

I tried using a couple of solutions.
Later on used Mathematical Induction (upon his hint)
Basically, a pairing for n = 2 leaf nodes is true
Assume a pairing exists for n = 2k leaf nodes (k > 0)
Now you need to prove a pairing exists for n = 2k+2 leaf nodes

So basically you just have to see the cases where you can insert the new nodes differently
I will probably try to contribute with an article on this.

Code was asked for both the questions.

Second Round (F2F) 45 mins \xe2\x80\x93 1 hr:
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1. Given a tree, and a pointer to some node in the tree, print the left most element in the same level as that node
2. Given a C-string, convert it into its ascii string. Ex: \xe2\x80\x9cCAR\xe2\x80\x9d -> \xe2\x80\x9c676582\xe2\x80\x9d (C-67, A-65, R-82)
Conditions are that you have to write it in C and you have to do it in place.
3. Lots of questions on programs, Inter process communication, pthreads, java garbage collector etc that went for around 20 mins

Third Round (F2F) 1 hr :
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1. Reverse k-alternate nodes in a Linked List
2. Given two strings s1 and s2, find if there exists a substring in s1 which contains an anagram of s2 (in O(n))
3. Given an input of the calendar objects of 10,000 microsoft employees, input is a time interval T and an employee[] array, find the first interval where all the employees in the employee[] array are free for a minimum time interval T (i.e schedule the meeting)
\xc2\xa0\xc2\xa0\xc2\xa0\xc2\xa0\xc2\xa0 I did this question using B+ trees and a Hash, I was told that max flow algorithms can be used.

Fourth Round (F2F) Hiring Manager \xe2\x80\x93 1 hr:
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1. Project/previous work
1. Design whatsapp\xe2\x80\x99s back end systems: (we should be able to handle 1 million requests a second and transmit data with least latency)
\xc2\xa0\xc2\xa0\xc2\xa0\xc2\xa0\xc2\xa0 I had used a lot of distributed systems concepts like message queues, sharding, CDNs, monitoring, InnoDB/MongoDB etc

Preparing questions on Scalability and Distributed Systems is highly recommended.

This site helped me a ton and I hope others will find their dream jobs too !
Thanks geeks \xf0\x9f\x99\x82

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All Practice Problems for Microsoft !

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