14 December 2016

Interview Preparation

Lecture: 2- Recursion & Maps

Ankush Singla

Doubts from last class?

Recursion

PMI

Lets do few problems

1. Implement Merge Sort
2. Suppose you have a string made up of only the letters 'a' and 'b'. Write a recursive function that checks if the string was generated using the following rules:
   a) the string begins with an 'a'
   b) each 'a' is followed by nothing or an 'a' or "bb"
   c) each "bb" is followed by nothing or an 'a'
3. Reverse a string using recursion

Lets do few problems

4. Return all subsets of an array
5. Count number of ways for a child to take n steps if she can take 1,2 or 3 steps at a time.
6. Using the phone keypad return all possible words that can be produced given input digits. e.g. 23 -> “ad, ae, af, bd, be, bf, cd, ce, cf”
    a) Instead of returning print all these

Hashing

Maps

Map

```
class Map{
    // accessor methods
    int size();
    boolean isEmpty();
    Object get(Object key);
    // update methods
    void put(Object key, Object value);
    void remove(Object key) ;
    Object[] keys();
    Object[] values();
    }
```

Implement a Map using Linked List

1. Find
2. Add
3. Remove

Any Other Options?

Hashtables

Components of Hashtables

1. Bucket Array
2. Hash Function
    a. Hash Code
    b. Compression Function

What if two keys map to same bucket?

Collision Handling

1. Separate Chaining
2. Linear Probing
3. Double Hashing

Running time for separate chaining?

1. Find
2. Add
3. Remove

Load Factor and Rehashing

Thank you

Ankush Singla
ankush@codingninjas.in