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Crux

Data Structures

Hashtables

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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();  
}
```

Java implementation of Map

1. Hashmap
2. Hashtable
3. Lets look at an example for Hashmap

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

Lets discuss few problems

1. Find intersection of two sorted arrays.
What about unsorted arrays?

Your Turn

1. Remove Duplicates from an array
2. Find pairs of elements in an array which sum to zero

Lets discuss few more DS problems

1. Find LCA for two nodes



Thank You!

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