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16

Crux

Lecture -19

Data Structures

Hashtables

Nidhi Agarwal



Maps

Java implementation of Map

- Hashmap
- Hashtable
- Lets look at an example for Hashmap

Lets discuss few problems

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

Your Turn

- Remove Duplicates from an array
- Find pairs of elements in an array which sum to zero

Lets Implement our own Hash Map

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

- Find
- Add
- Remove

Any Other Options?

Hashtables

Components of Hashtables

- Bucket Array
- Hash Function
 - a. Hash Code
 - b. Compression Function

What if two keys map to
same bucket?

Collision Handling

- Separate Chaining
- Linear Probing
- Quadratic Probing
- Double Hashing

Running time for separate chaining?

- Find
- Add
- Remove

Load Factor and Rehashing



Thank You !! 😊

Nidhi Agarwal

nidhi@codingblocks.com