

Hashes



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What Is a Hash?

Order?



Map

20mm



Key

Value



[“a”, “b”, “c”, “d”]
↑
0 ↑
1 ↑
2 ↑
3 ↑

Determining the Hash Value



Keys are unique

“8mm”
“10mm”
“12mm”

Hash code? → int

public int hashCode()

```
public int hashCode() {  
    int h = hash;  
    if (h == 0 && value.length > 0) {  
        char val[] = value;  
  
        for (int i = 0; i < value.length; i++) {  
            h = 31 * h + val[i];  
        }  
        hash = h;  
    }  
    return h;  
}
```

Big O?

Demo

Create hash table class

Underlying data structure and hash entry

Demo

Create size method

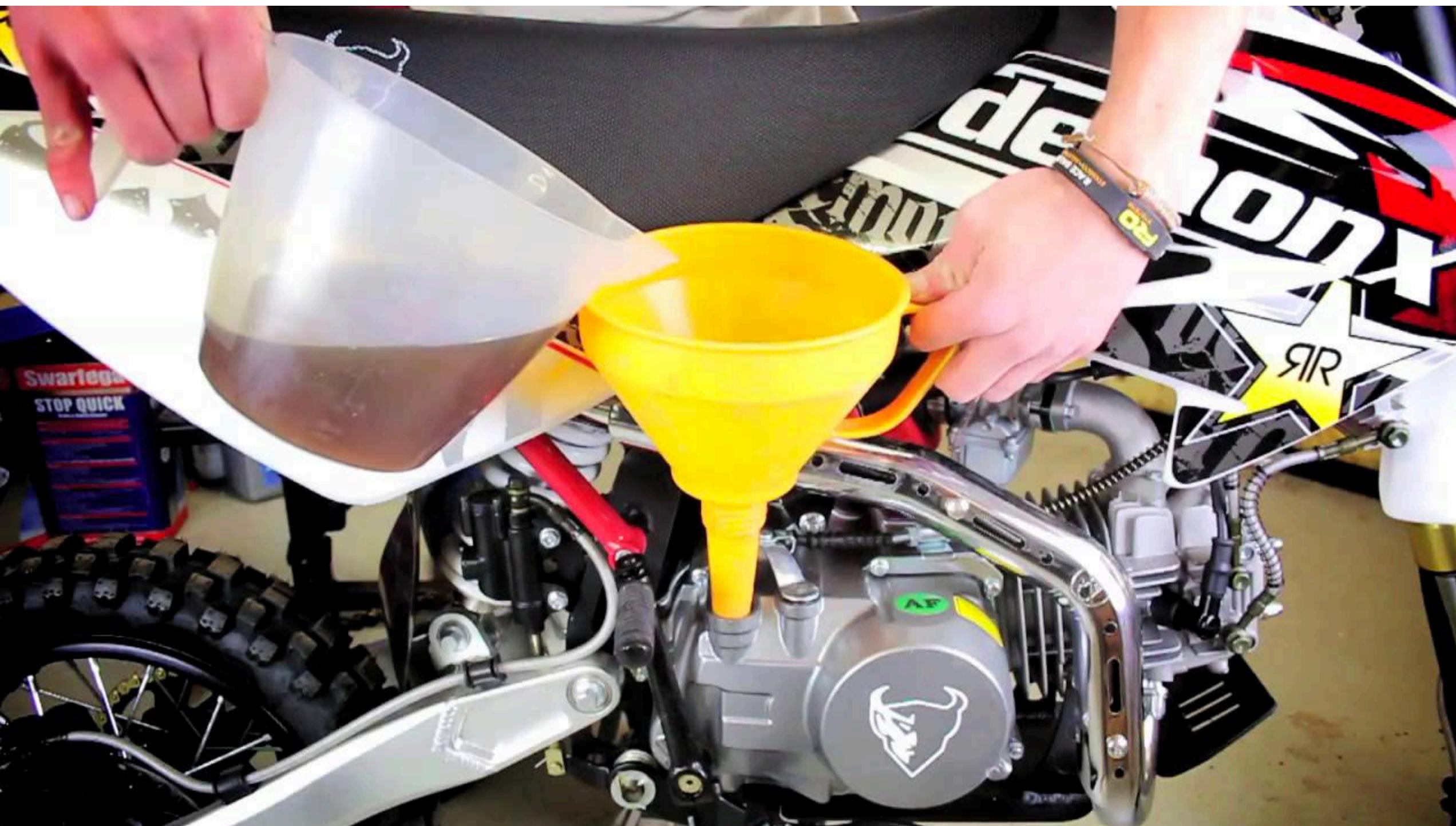
Create get/put methods

Demo

Create delete method

Create hasKey/hasValue methods

Oil Change Test



Core Java Hashes

Map<K,V>

- <https://docs.oracle.com/javase/8/docs/api/java/util/Map.html>

Hashtable<K,V>

HashMap<K,V>

Hash Extra Credit

Homework



How can you reduce hash collisions?

- Increase the Hash capacity
- Improve the hashCode() method quality

Summary

What is a hash?

Built basic hash table class and underlying structure and hash entry.

Built get, put, delete, hasKey and hasValue

Java hashes

Collisions