Chapter 20: Hash Tables

Only:
- insert
- find
- delete

Constant Time!
- no sorting

% expensive

retrieve or ~~add~~ delete anything!!

- hash function takes huge number and maps to smaller

what about strings?
- add char int value

Set
- no duplicates

HashSet
- ↑

HashSet - faster
TreeSet - Sorted

TreeSet
- uses tree to keep order

java.lang.String
- ".hashCode"

Map
- one value → different value

HashMap ≈ TreeMap

Chapter 20: Linear Probing

- Squishing large set, some values might occupy the same space.
- go down & find next free spot

1. hash 89, 10 = 9 2. hash 18, 10 = 8 3. hash 49, 10 = 9

0		49	
1			
2			
3			
4			
5			
6			
7			
8		18	18
9	89	89	89

- when changing size, all hashes must be re-computed

no cluster

linear probing

Quadratic

Quartic Probing

- try H the $H+1^2$ then $H+2^2$...
- issue with single spot
- issue with 0
- size must be prime!

Seperate Chaining

- no probing
  - "linear"
- size can grow

0		
1		
2		
3		
4		
5	89	9
6	18	8
7	49	9
8	58	8
9		

0		49	49	
1				
2			58	
3				
4				
5				
6				
7				
8		18	18	18
9	89	89	89	89