Maps and Sets

What is a data structure

- Particular way of organizing data in a computer so that it can be used efficiently
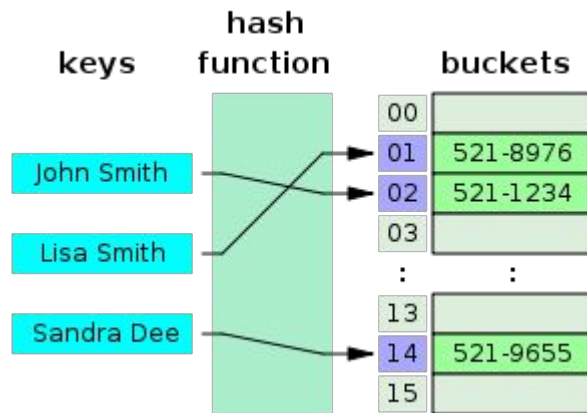

- Types of data structures?
  - **Map**
  - **Set**
  - Trees
  - Stacks
  - Queues

What is a Map? (Java)

- Holds some (K, V) pair, where k = key, v = value
- Maps keys to values
- No duplicates
- No set order
- We have different implementing types
  - HashMap
  - TreeMap
  - LinkedHashMap
- Used to represent graphs, store tuple data

HashMap (Generalized)

- Uses a 'hashing' function so that each key is represented by a hash code
  - F(key) = hash
- What happens when we have collisions (same keys)
  - Bucketization
- Insertion, Search, Deletion
  - O(n): worst case
  - O(1): average case

What is a Set

- Similar to a mathematical finite set
- Stores values without order and no repeated values
- Like a map but no key value pair (only values)
- Big-O: Same as HashMap
- Used for checking if values are contained

Sample Problem

https://uva.onlinejudge.org/index.php?option=onlinejudge&page=show_problem&problem=2315

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