Hash Sets and Maps

Sets

- Sets contain no duplicate elements
- Models the mathematical concept of a set
- Set Interface
  - `add`
  - `contains`
  - `isEmpty`
  - `remove`
  - `size`
  - `iterator`
  - ...
- Implemented by:
  - `HashSet`
  - `TreeSet`

HashSet

- Built on Hash table
- Unordered Data Set
- fast operations:
  - `add`
  - `remove`
  - `contains`

Maps

- A mapping of keys to values
- A collection of key/value pairs
- Example: A dictionary
  - Key is the word
  - Value is the definition
- Map Interface
  - `values()`: Collection of values
  - `keySet()`: Set<> of keys
  - `entrySet()`: Set<> of key/value pairs
  - `put(key, value)`
  - `get(key)`
  - `remove(key)`
  - `containsKey(key)`
  - `containsValue(val)` (note, not fast)
- Implemented by:
  - HashMap
  - TreeMap

HashMap

- Built on Hash table
- Unordered Data Set
- fast operations:
  - `put`
  - `get`
  - `containsKey`
  - `remove`
- Works by hashing the key, then storing the pair in the appropriate place in the table.