

# Maps and Sets

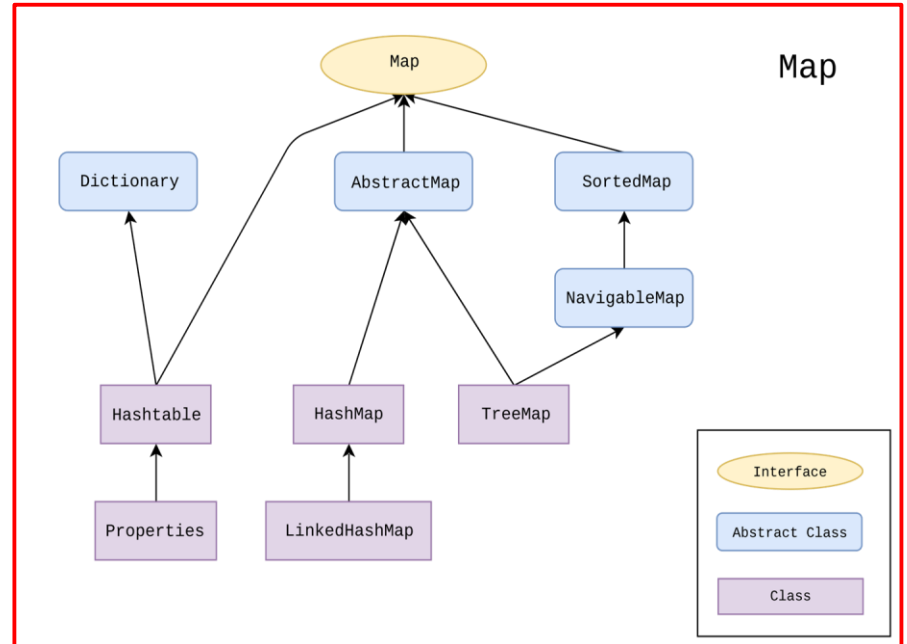
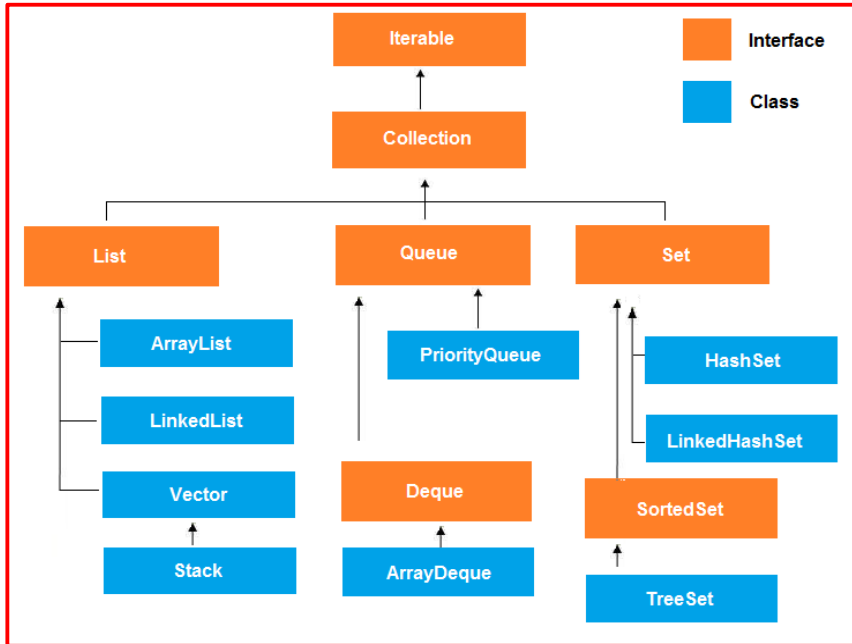
**Map, Set, HashTable**

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# Introduction

- Map (or dictionary) is list of (key, value) pairs, where keys are unique
- Set is a map which values are unique as well (max 1 null value)
- There are many implementations of maps and sets in java API



# HashTable

- Uses hash function to find position of data
- In case position is already taken => collision
- Many different algorithms to solve collision
  - 1) chaining => create linked list and with all the elements that should be at that position
  - 2) linear probing => try to put element in next position
  - 3) use second hash function to find next position
- Insert / find / remove value in  $O(1)$  time - requires good distribution of data
- **Java API implementations:** HashTable, HashMap, HashSet
- HashTable is HashMap which doesn't accept null
- **Main functions:** isEmpty(), get(K key), put(K key, V value), remove(K key), size()

# Hash Tables




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