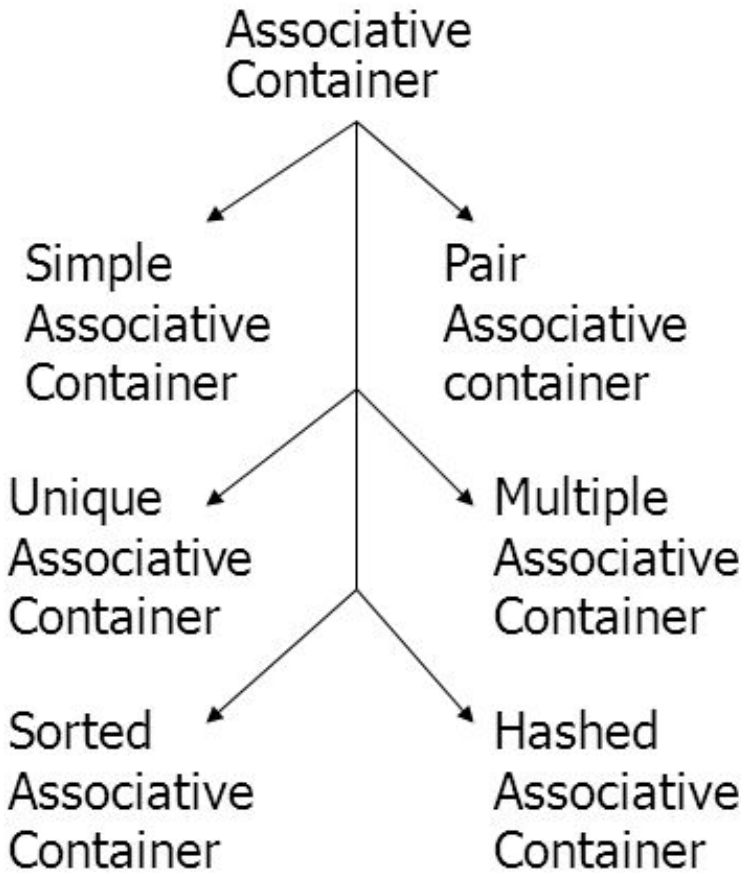
STL Associative Containers

Overview of STL Associative Containers

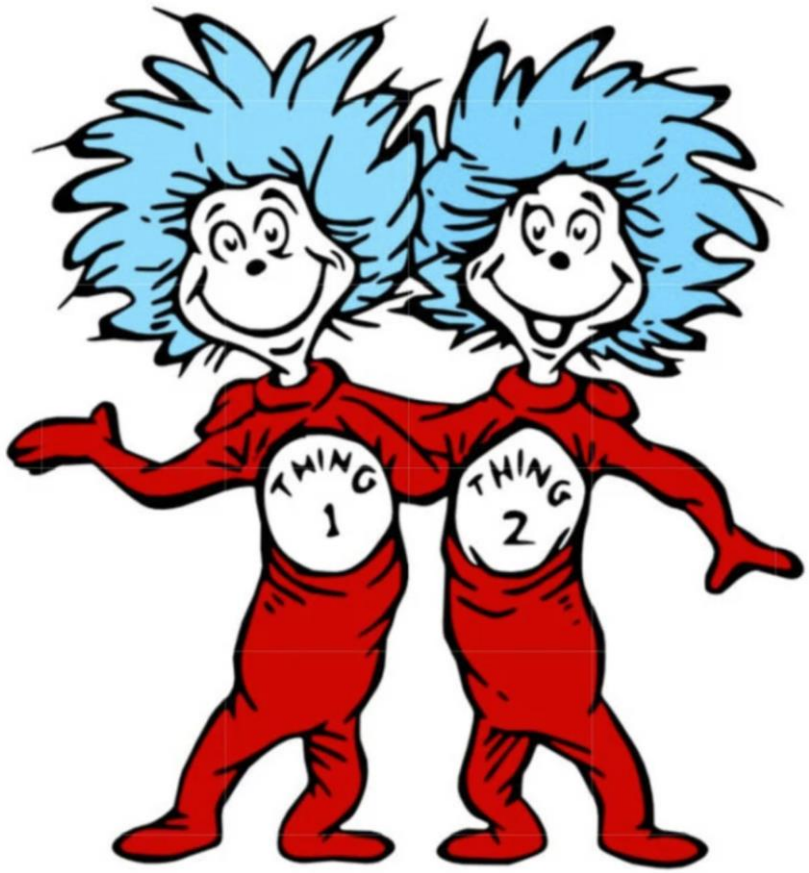
- Associative containers are data structures that support efficient insertion, deletion, & find operations based on keys



See embeddedartistry.com/blog/2017/08/30/choosing-the-right-container-associative-containers

Overview of STL Associative Containers

- There are two types of STL associative containers



Overview of STL Associative Containers

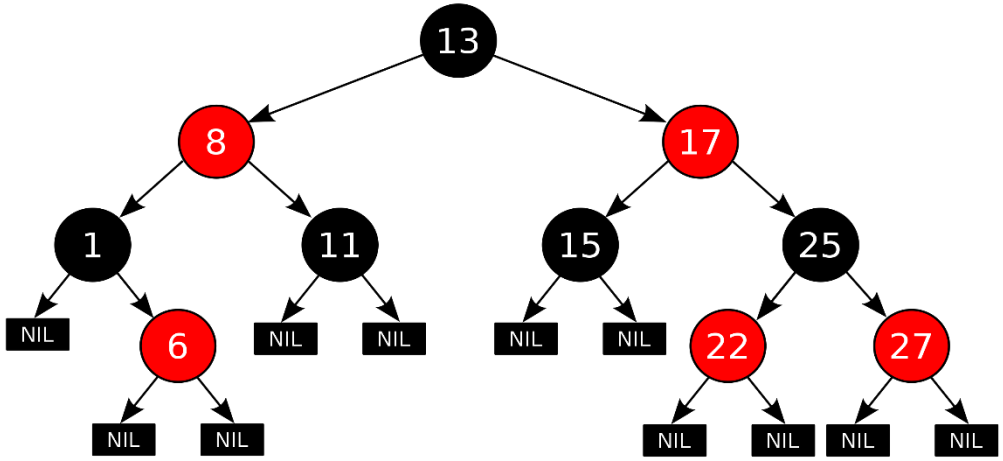
- There are two types of STL associative containers
  - **Ordered associative containers** that support efficient operations on elements using keys ordered by `operator<`

Category	Containers	Characteristics
Ordered associative	set	Defines where the elements' values are the keys and duplicates *are not* allowed. It has fast lookup using the key,
	multiset	Defines where the elements' values are the keys and duplicates *are* allowed. It has fast lookup using the key,
	map	Key-to-value mapping where a single key can only be mapped to one value,
	multimap	Key-to-value mapping where a single key can be mapped to many values.

See en.wikipedia.org/wiki/Associative_containers

Overview of STL Associative Containers

- There are two types of STL associative containers
  - **Ordered associative containers** that support efficient operations on elements using keys ordered by `operator<`
    - Implemented as balanced binary trees



See en.wikipedia.org/wiki/Red-black_tree

Overview of STL Associative Containers

- There are two types of STL associative containers
  - **Ordered associative containers** that support efficient operations on elements using keys ordered by `operator<`
    - Implemented as balanced binary trees
    - Keys are const & can't be changed via iterators

Overview of STL Associative Containers

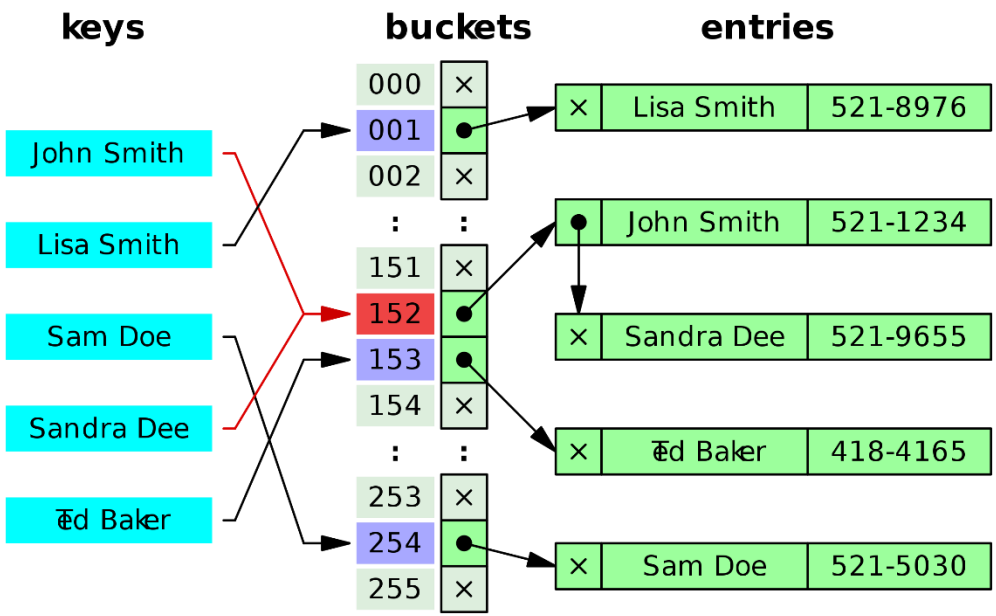
- There are two types of STL associative containers
  - **Ordered associative containers** that support efficient operations on elements using keys ordered by `operator<`
  - **Unordered associative containers** that maintain data in structures suitable for fast associative operations

Category	Containers	Characteristics
Unordered associative	unordered_set	Defines where the elements' values are the keys and duplicates *are not* allowed. It has fast lookup using the key,
	unordered_multiset	Defines where the elements' values are the keys and duplicates *are* allowed. It has fast lookup using the key,
	unordered_map	Key-to-value mapping where a single key can only be mapped to one value,
	unordered_multimap	Key-to-value mapping where a single key can be mapped to many values.

See en.wikipedia.org/wiki/Unordered_associative_containers_(C++)

Overview of STL Associative Containers

- There are two types of STL associative containers
  - **Ordered associative containers** that support efficient operations on elements using keys ordered by `operator<`
  - **Unordered associative containers** that maintain data in structures suitable for fast associative operations
    - Implemented as hash tables



See en.wikipedia.org/wiki/Hash_table

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- There are two types of STL associative containers
  - **Ordered associative containers** that support efficient operations on elements using keys ordered by `operator<`
  - **Unordered associative containers** that maintain data in structures suitable for fast associative operations
    - Implemented as hash tables
    - Keys are const & can't be changed via iterators