STL Cheat Sheet 2 – set, map

Creation

- Make an empty set of integers.
  
  ```cpp
  set<int> intSet1;
  ```

- Make a set of integers containing the given array of numbers.
  
  ```cpp
  int array[] = {10, 20, 30, 40};
  set<int> intSet2(array, array + 4);
  ```

- Make an empty map from string to int.
  
  ```cpp
  map<string, int> siMap1;
  ```

- Make an empty map from C-string to int.
  
  ```cpp
  struct compareString {
      bool operator()(const char *s1, const char *s2) const {
          return strcmp(s1, s2) < 0;
      }
  };
  ```

  ```cpp
  map<const char *, int, compareString> siMap2;
  ```

- Declare an iterator for a set of integers.
  
  ```cpp
  set<int>::iterator iSetItr;
  ```

- Declare an iterator for a string to int map (a map iterator represents a pair of key and value).
  
  ```cpp
  map<string, int>::iterator siMapItr;
  ```

Access and modification

- Number of items in a set (also for map).
  
  ```cpp
  intSet1.size();
  ```

- Get an iterator which points to the beginning of the set.
  
  ```cpp
  iSetItr = intSet1.begin();
  ```

- Get an iterator which points to the end of the map (one past the last element).
  
  ```cpp
  siMapItr = siMap1.end();
  ```

- Get the value that is pointed to by the set iterator.
  
  ```cpp
  *iSetItr
  ```

- Get the key that is pointed to by the map iterator.
  
  ```cpp
  siMapItr->first
  ```

- Get the value that is pointed to by the map iterator.
  
  ```cpp
  siMapItr->second
  ```
Finding

- Find an item in a set (returns an iterator).
  ```
  intSet1.find(3)
  ```
- See if an item is in a set.
  ```
  if (intSet1.find(3) != intSet1.end()) ...
  ```
- Find an item in a map (returns an iterator).
  ```
  siMap1.find("hello")
  ```
- See if an item is in a set.
  ```
  if (siMap1.find("hello") != siMap1.end()) ...
  ```

Insertion and removal

- Place an item in a set.
  ```
  intSet1.insert(3)
  ```
- Place a key/value in a map.
  ```
  siMap1["hello"] = 3
  ```
- Removing an item from a set.
  ```
  intSet1.erase(intSet1.find(3))
  intSet1.erase(intSet1.begin())
  ```
- Removing an item from a map.
  ```
  siMap1.erase(siMap1.find("hello"))
  siMap1.erase(siMap1.begin())
  ```
- Clearing a set or a map.
  ```
  intSet1.clear(), siMap1.clear()
  ```