

# STL and Tree

# Standard Template Library (STL)



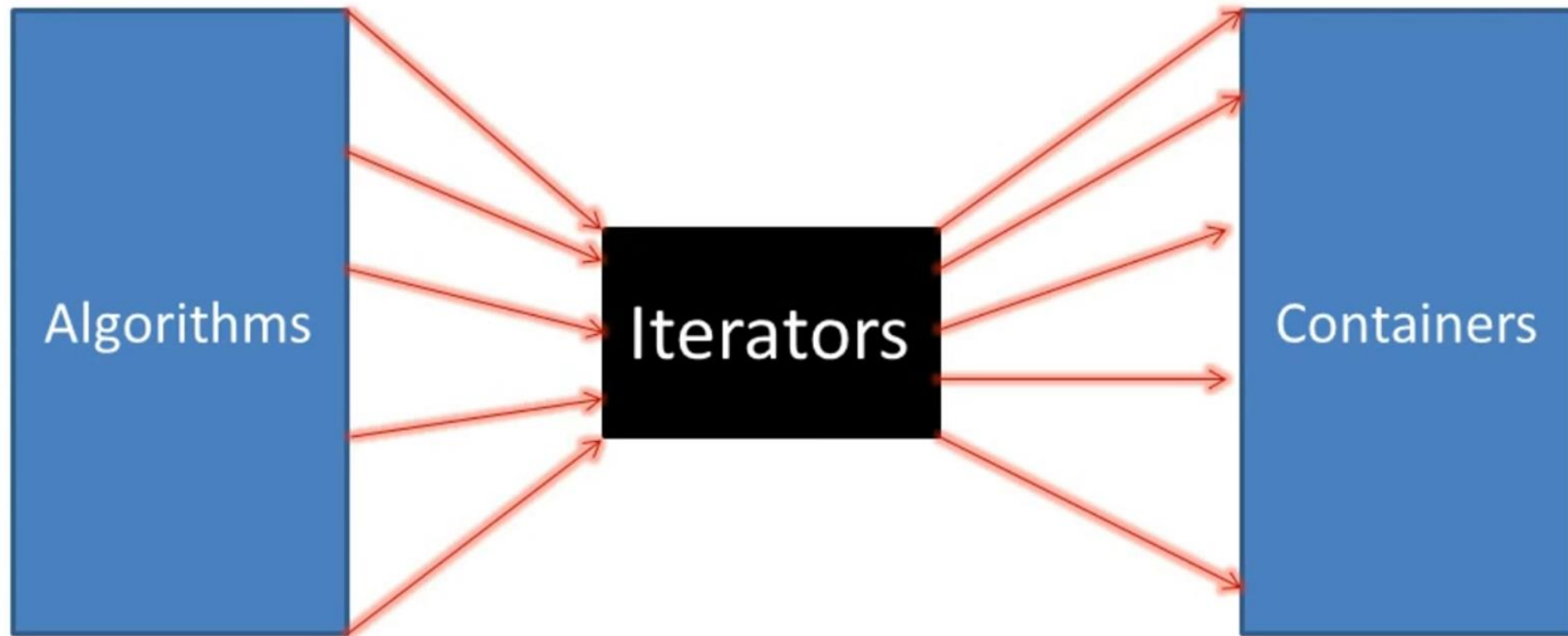
The diagram consists of two blue rectangular boxes, one on the left and one on the right. The left box is labeled 'Algorithms' and the right box is labeled 'Containers'. A small mouse cursor is positioned between the two boxes. Below the boxes, a text line states: 'N Algorithms + M Containers = N \* M implementations.'

Algorithms

Containers

$N \text{ Algorithms} + M \text{ Containers} = N * M \text{ implementations.}$

# Iterators



N Algorithms + M Containers = ~~N \* M implementations.~~

N + M implementations.

Easily extendable

# Containers

- Sequence containers (array and linked list):
  - vector, deque, list, forward list, array
- Associative Containers (binary tree)
  - set, multiset,
  - map, multimap
- Unordered Containers (hash table)
  - Unordered set/multiset;
  - Unordered map/multimap

# Sequence Containers

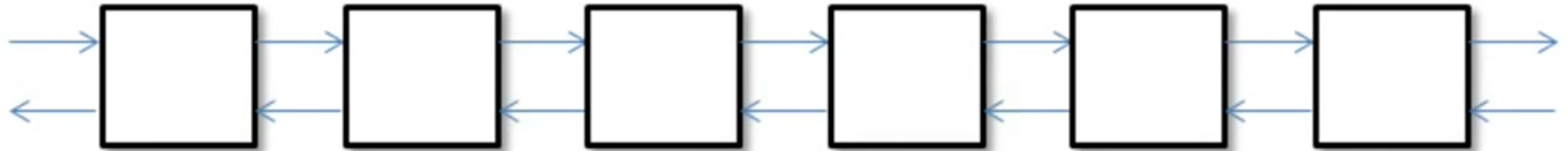
Vector:



Deque:

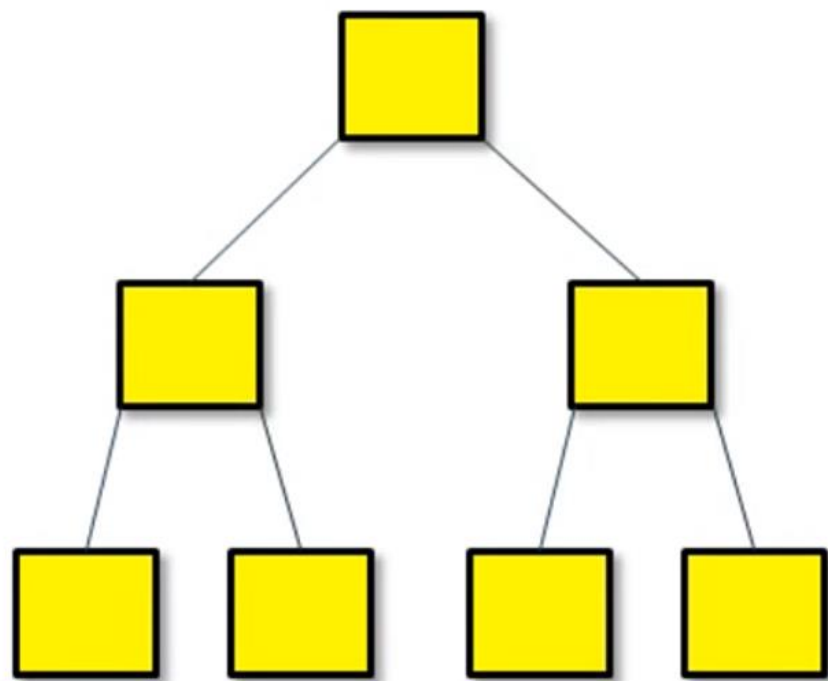


List:



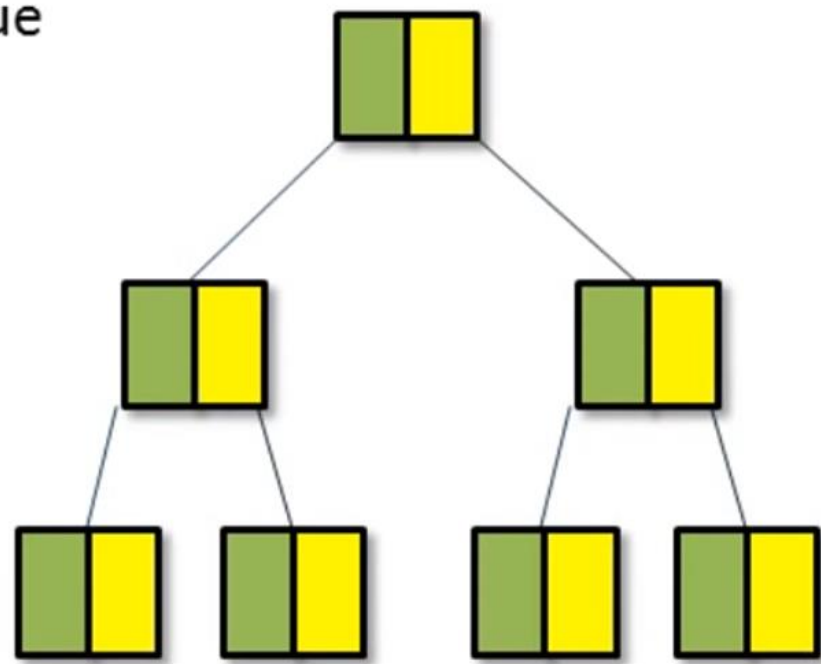
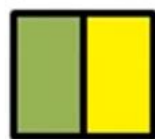
# Associative Container

Set or Multiset:



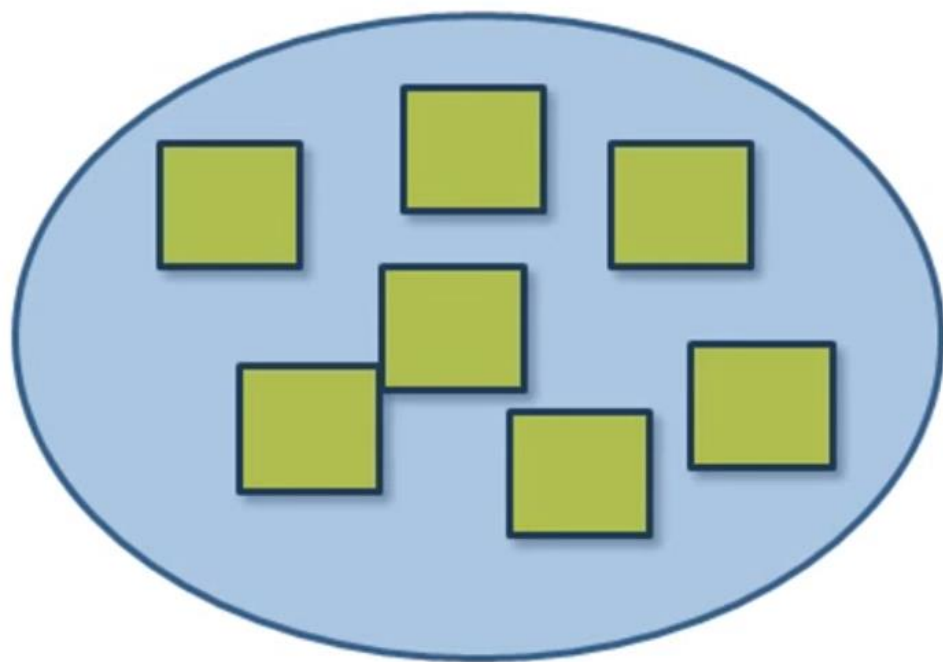
Map or Multimap:

Key Value

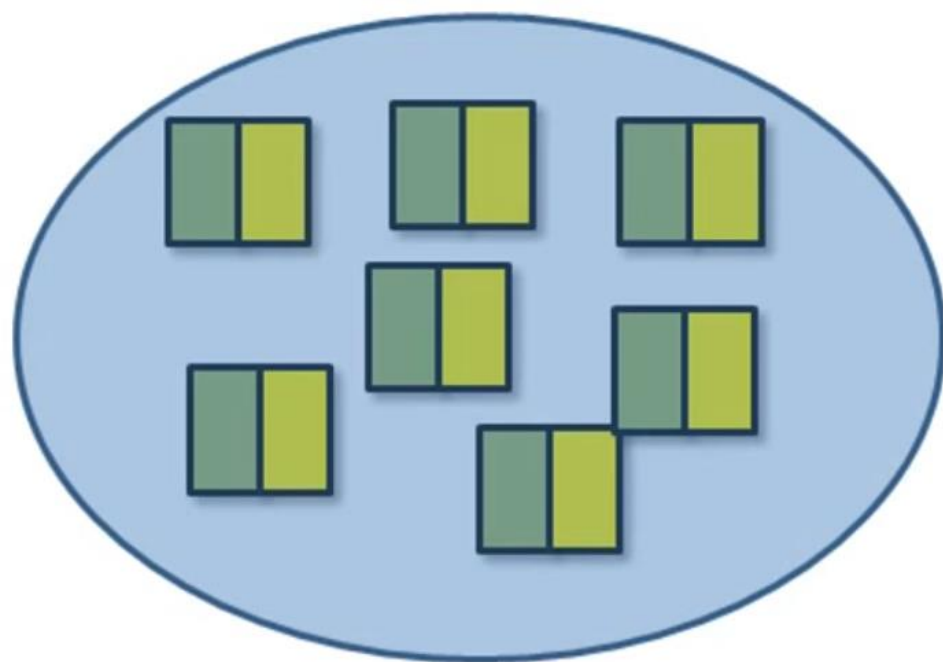


# Unordered Associative Container (C++ 11)

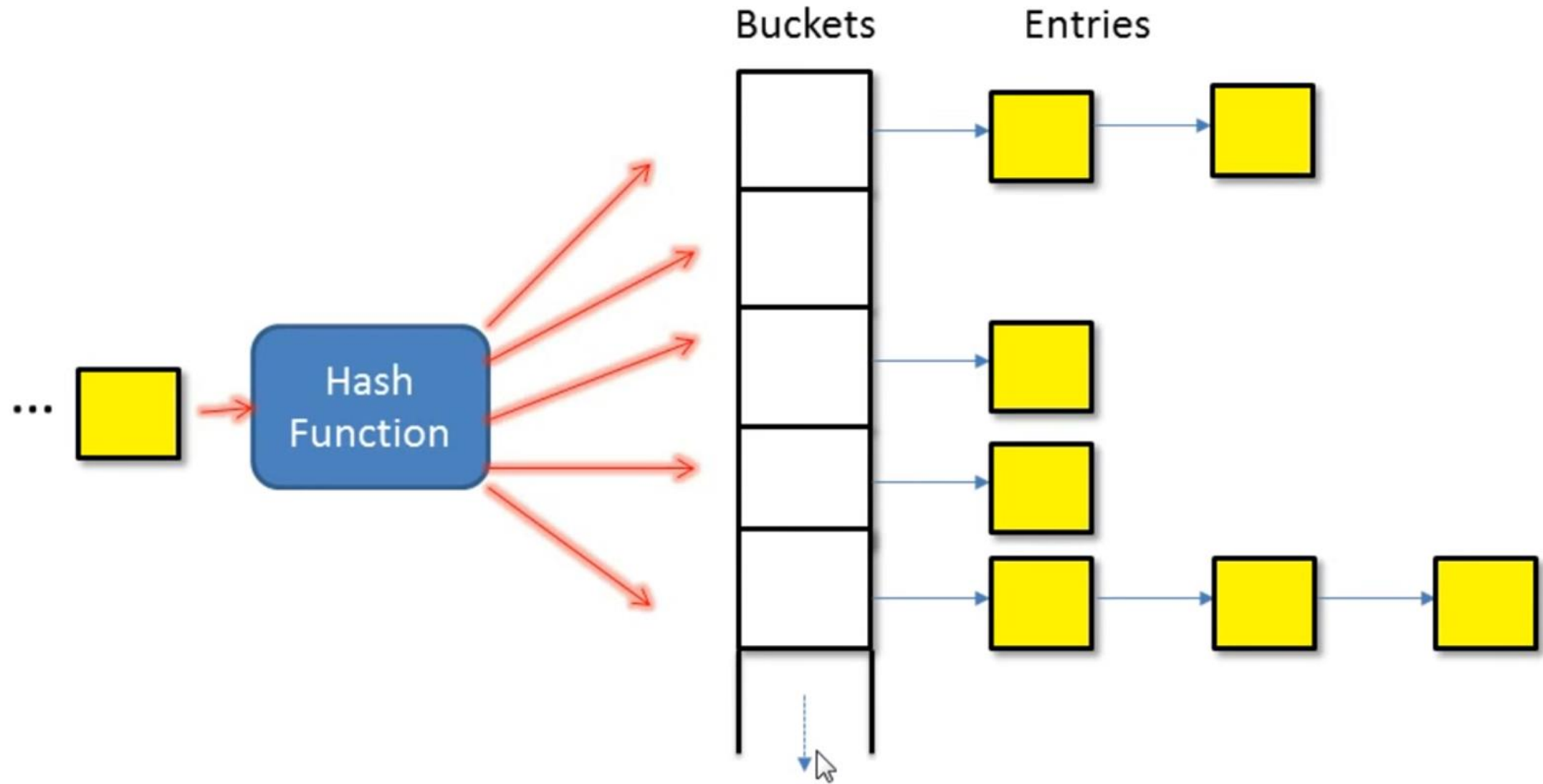
Unordered  
Set or Multiset:



Unordered  
Map or Multimap:



# Implementation of Unordered Containers





# Reference

- <https://github.com/gibsjose/cpp-cheat-sheet/blob/master/Data%20Structures%20and%20Algorithms.md>
- <https://github.com/wasit7/toi/tree/master/python/tutorials>