C201 / I211

Standard Template Library

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What is STL?

- STL is a set of C++ template classes that provide general-purpose classes which implement many popular and commonly used algorithms and data structures like vectors, lists, queues, and stacks.
3 Components of STL?

- Containers

- Algorithms
  - Sort, search, reverse, sum, max, min, count

- Iterators
Containers

Containers are used to manage collections of objects of a certain kind. There are several different types of containers like deque, list, vector, map, etc.
Algorithms

- Algorithms act on containers. They provide the means by which you will perform initialization, sorting, searching, and transforming of the contents of containers.
Iterators

- Iterators are used to step through the elements of collections of objects. These collections may be containers or subsets of containers.
Example of STL containers

- Vectors (dynamic array, with ability to resize, contiguous memory)
- Lists (like a doubly linked list, non-contiguous memory, slower than vectors,)
- Forward List (like a single linked list, can not iterate backward)
- Queue (Container Adaptor implementing a queue)
- Stack
- Deque (double ended queue, non-contiguous, can insert from front and back of the queue)
- Array (knows its size, more reliable to use)
- Set, multiset (each element has to be unique,)
- Map, multimap (an associative array) (key, value)