Midterm 2 Review

Sets
- Holds unique elements
- Ordered Set
- Unordered Set
- Iterate via iterators
- Efficient at `find`, `insert`, `remove`

Maps
- Associating keys with values
- Keys must be unique; values may be anything
- Ordered / Unordered Maps
- Efficient at getting a value given a key, putting a key/value pair, remove key/value pair, update value given key, and determine if map has a key
- Pair class
- Difference between `.insert()`, `.emplace()`, `[]`
- Editing values without making copies

Hashtables
- O(1) table lookups
- Basic idea: convert key to hash code, find index, store key at index
- Collisions (and chaining)
- What constitutes a 'good' hash function?
- What data structures use hashtables?

Dynamic Allocation of Memory
- Array variables are pointers
- Pointer arithmetic
- Array limitations conquered by Dynamic Array Allocation
- Where does memory come from?
- Difference between creating new objects in Stack vs Heap
- Dynamic Memory Don'ts
- Deleting Dynamical Allocated Memory

Operator Overloading
- Member vs Non-member functions
- Mixed Overload
- How to overload
Big 3

• Copy Constructor
• Assignment Operator
• Destructor
• Shallow vs Deep Copy
• Default behaviors and how to fix them

Templates

• Purpose of templates
• Function vs Class Templates
• How to apply templating