Heaps

1. Read
   a. The lab handout
   b. Chapter 13
2. Finishing up Traversal: Level (breadth-first) Order Traversal
   a. Slowly but simply with recursion
   b. Cleverly and elegantly without recursion
3. Kinds of binary trees
   a. Full =
   b. Complete =
   c. Balanced =
   d. Heap
      i. Min-heap
      ii. Max-heap
      iii. Example: Put the following into complete min and max heaps: 1 3 3 4
4. Priority Queue Data Structure
5. A complete heap (or any binary tree) can be stored in a vector
6. What are the space savings of the vector representation?
   a. Assume empty Object takes 8 bytes
   b. Pointers cost 4 bytes
   c. Integer costs 16 bytes
   
   ```java
   public class Node<T> {
       private T value;
       private Node<T> parent;
       private Node<T> left;
       private Node<T> right;
   }
   ```
   
   T[]

Catch:

7. Heap.add

8. Heap.removeMin