Testing Procedures MM Heap()

* To test operations, my driver file has a method testCases() which performs the following operations on both an empty and a full array to be "heapified":

  - insert(n) - Inserts a random int for empty. A max int value for full.
    - Attempts to overfill the empty array to show insert cannot do so.
  - max() - prints the largest element from both heaps *
  - min() - prints the smallest element from both heaps *
    * After population
  - extractMin() - Removes the smallest element from both
  - extractMax() - Removes largest element from both

* All operations are followed by a call to printHeap() in the MM Heap class. This provides a visual aid to verify the correctness of each operation.
  - PrintHeap() - Counts the current level as it iterates through the array & provides a crude printout of the heap structure.
    - If the index + 1 equals 2^n, where n is the current level, then we are at a new level and should print as such. Increment level
    - Spacing is inefficient, but gets the job done

* Calls to insert() validate the correctness of getParent() and bubbleUpMin() or bubbleUpMax() respective to element value.

- getLeftChild(), getRightChild(), getParent() and getAncestor() are trivially correct through an understanding of binary tree implementation. Validation may involve passing a known node and observing correctness with printHeap().

- getLargestGrandChild() and getSmallestGrandChild() may be validated by passing a known node and then observing correctness by printing it's retrieved value, then validating with printHeap().

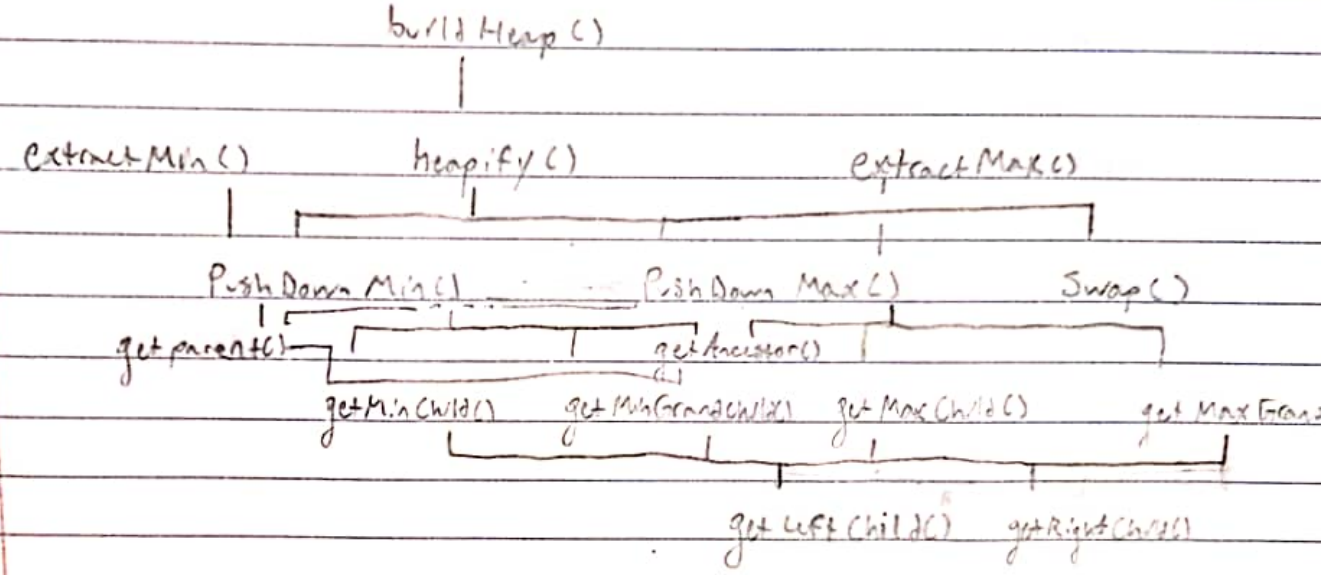
  - getMaxChild() and getMinChild() may also be validated using this strategy.

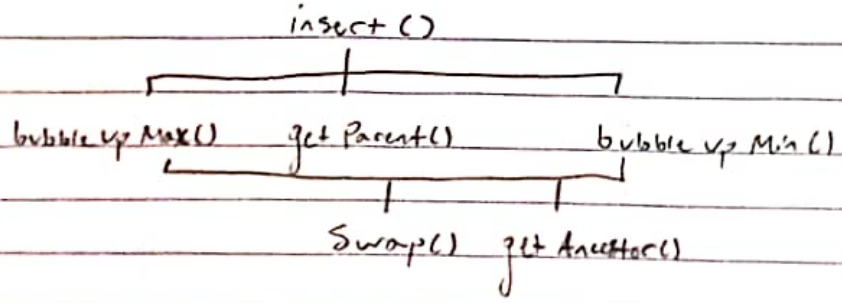
* PushDownMin() and PushDownMax() may be validated through a careful trace of each algorithm given the correctness of their dependencies. A call to the testCases() method and an observation that heap properties are maintained validates the correctness of both algorithms.

All testing should follow the order of testing methods starting with their dependencies.

Dependencies

testCases() - All





printHeap()
findLevel()
min()
max()

} No dependencies / relations

Sorry this looks rough!