CS 340 Fall 2017
Homework 1
Due 11:59 PM Thursday
September 21
Homework 1

• Implement the PriorityQueue class shown on the following pages. An instance of PriorityQueue is a d-heap. A d-heap is similar to a binary heap except each node in the complete tree containing the values in the heap can have up to d children. A d heap can be stored in an array like a binary heap. Unlike a binary heap implementation, a d-heap implementation usually begins storing values in position 0 of the array. Given a node stored at position i. The children of the node can be found at positions d*i+1 through d*i+d and the parent can be found at position (i-1)/d (integer division).
import java.util.*;

public class PriorityQueue {
    // implements a d-heap based priority queue
    // the priority is an int (low value is high priority)
    // associated with each priority is an object

    private class Item {
        private int priority;
        private Object data;

        private Item(int p, Object d) {
            priority = p;
            data = d;
        }
    }
}
private Item queue[];
private int order;
private int size;

public PriorityQueue(int ord, int s) {
    queue = new Item[s];
    order = ord;
    size = 0;
}
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public int getPriority() {
    //PRE !empty()
    //Return the highest priority value in the queue

}

public Object getData() {
    //PRE !empty()
    //Return the data object associated with the highest priority

}
public void remove() {
 //PRE !empty()
 //Remove the item with the highest priority in the queue

}

public int getSize() {
 //Return the number of items in the queue

}
public boolean full() {

}

public boolean empty() {

}

public void insert(int p, Object d) {
//PRE: !full()
//Insert a new item into the queue with priority p and associated data d

}

public static void main(String args[]) {

}
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- Use the main method to develop a test driver for your implementation
- Submit **only 1 Java file**. The file **must** be called PriorityQueue.java
- Email the file to tgendreau@uwlax.edu with a subject line of CS340 H1
- Add comments to each private method and additional instance variables you add.