Quiz 10 - Heaps and Priority Queues

CS 14 - Data Structures

May 8, 2013

Questions:

1. What are the two invariants of a binary heap?

   (a)

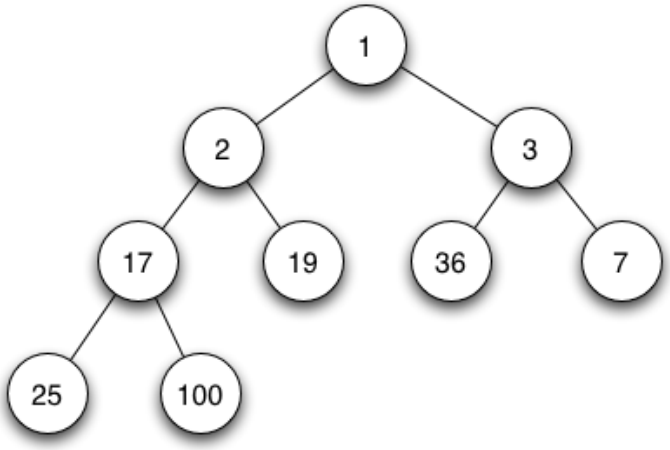
   (b)

2. What is the best and worst case depth of a binary heap with n elements?

3. Given a binary heap, write the best and worst case run times for each of these functions.

	best	worst
(a) insert		
(b) delete		
(c) delete−min		

4. Given this binary heap t:



Draw the binary heap created by the following code:

```
t->insert(71);
t->delete(19);
t->delete(1);
t->delete(7);
t->insert(77);
t->insert(78);
t->insert(79);
t->insert(80);
```

5. What is the difference between a priority queue and a queue?

6. Assuming we use a binary heap to implement our priority queue, what are the runtimes of these functions:

	best	worst
(a) enqueue		
(b) dequeue		

What if we used an AVL tree? What if we used a linked list? What if we used a *sorted* vector?