

Data Structures - Quiz - 10

Question:

- (1) (2 points) Write a method to calculate the height of a heap:
`public int height()`
- (2) (5 points) What positions in a heap can the largest element be in, in terms of height and size?
- (3) (3 points) Implement void `max()` that returns the maximum entry in a heap of integers. Make sure it checks as few elements as possible.

Solution:

```
1 // Question 1
2 public int height() {
3     int height = 0;
4     int pos = 0;
5     while (pos < size) {
6         int newpos = (pos * 2) + 1;
7         if (newpos < size) {
8             height++;
9         }
10        pos = newpos;
11    }
12    return height;
13 }
14
15 // Question 2
16 // Graded based on validity of student response
17
18 // Question 3
19 public int max() {
20     int max = 0;
21     for (int i = size / 2; i < size; i++) {
22         if (array[i - 1] > max) {
23             max = array[i - 1];
24         }
25     }
26     return max;
27 }
```