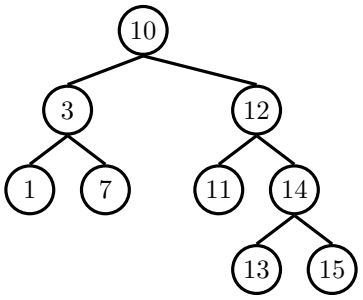
CS 61B Fall 2020

Traversals, Tries, Heaps

Discussion 9: October 19, 2020

1 Tree Traversals



Write the pre-order, in-order, post-order, and level-order traversals of the above binary search tree.

Pre-order:

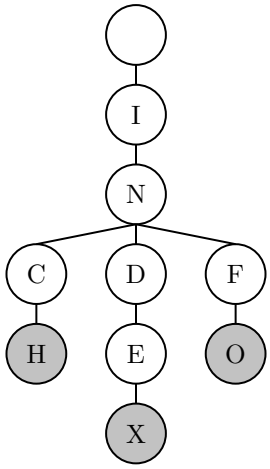
In-order:

Post-order:

Level-order (BFS):

2 Tries

What strings are stored in the trie below? Now insert the strings *indent, inches, and trie* into the trie. *Extra:* How could you modify a trie so that you can efficiently determine the number of words with a specific prefix in the trie?



3 Heaps of Fun

(a) Assume that we have a binary min-heap (smallest value on top) data structure called `Heap` that stores integers, and has properly implemented `insert` and

`removeMin` methods. Draw the heap and its corresponding array representation after each of the operations below:

```
1 Heap<Character> h = new Heap<>();
2 h.insert('f');
3 h.insert('h');
4 h.insert('d');
5 h.insert('b');
6 h.insert('c');
7 h.removeMin();
8 h.removeMin();
```

(b) Your friendly TA Anjali challenges you to quickly implement an integer max-heap data structure. However, you already have written a min-heap and you don't feel like writing a whole second data structure. Can you use your min-heap to mimic the behavior of a max-heap?

Hint: Although you cannot alter them, you can still use methods from `MinHeap`.