CMPT 202 - Tree Exercises

Most of the following questions refer to the tree shown below:

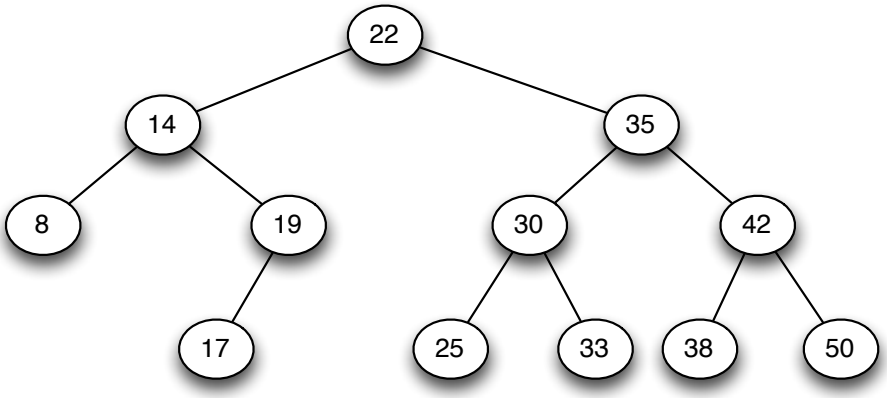

Figure 1: Example tree

1. What node is at the root of the tree?
2. What are the leaf nodes?
3. What node is the parent of 42?
4. Are nodes 19 and 30 siblings?
5. What is the height of this tree?
6. What level is node 19?
7. Is this a binary or general tree?
8. If it is a binary tree, is it
   (a) a binary search tree?
   (b) a full binary tree?
   (c) a complete binary tree?
9. What are the pre-order, in-order, and post-order traversals of this tree?
10. Write the expression tree for the following expressions:

    $m * n * o + p$ $a * (b + c) * d$

11. What is the height of the shortest binary tree that contains 21 nodes?

12. Draw the shortest possible binary search tree from the following set of strings

    { *Ann, Ben, Charles, David, Elizabeth, Fred, Gary, Harold, Isabel, Jay, Kelly* }

13. At most how many nodes can a binary tree have at level n?

14. Insert the following values into a binary search tree:

    { 26, 12, 2, 3, 4, 5, 15, 35, 1 }

15. Show the resulting tree after deleting the node with value 35.

16. Provide three examples from everyday life where a decision tree can be used?