Data *Structures*

Homework 1

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Teaching, Training and Coaching since more than a decade!

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Problem #1: Tree Max

- int tree_max()
- Inside BinaryTree class, add this member function. It returns the maximum value in the whole tree
  - The function should follows the recursive style
  - E.g. similar to preorder traversal
- In the this tree, the max value is 13
- Create several trees using the add functions we learned and test your code
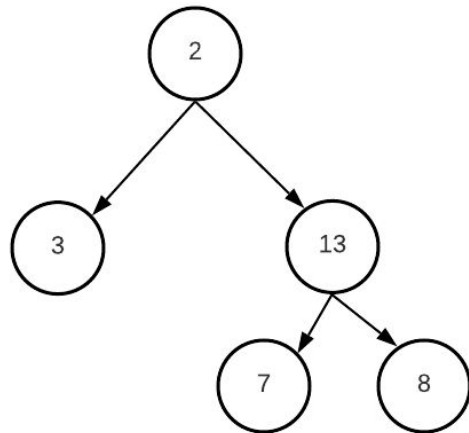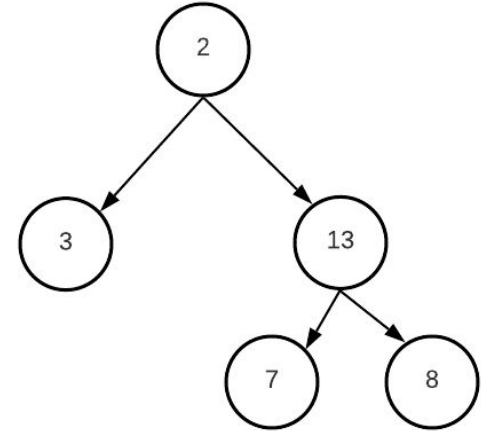
Problem #2: Tree Height

- int tree_height()
- It returns the height of the whole tree
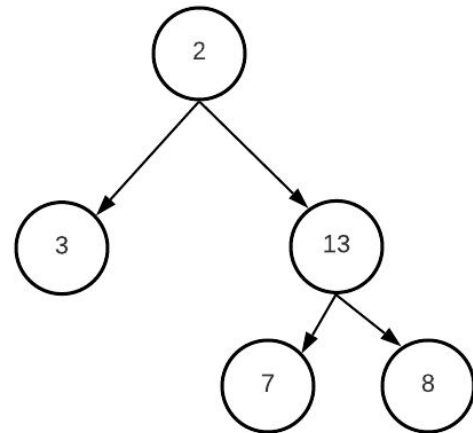- In the this tree, the answer is 2 coming from right branch
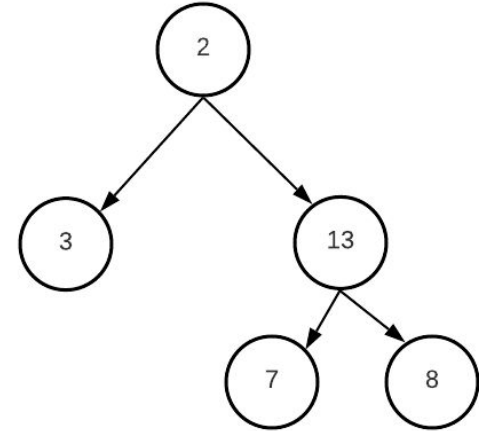
Problem #3: Count all nodes

- int total_nodes()
- It returns the total number of nodes in the tree
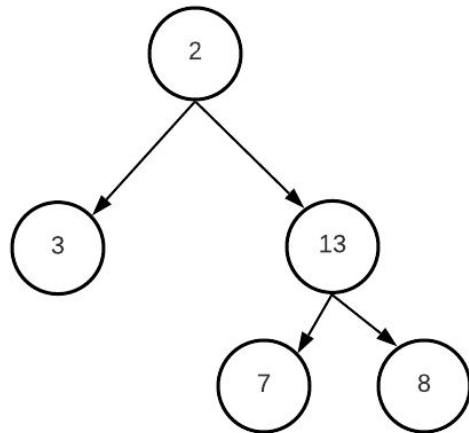- In the this tree, the answer is 5

Problem #4: Count leaf nodes

- int total_nodes()
- It returns the number of leaf nodes in the tree
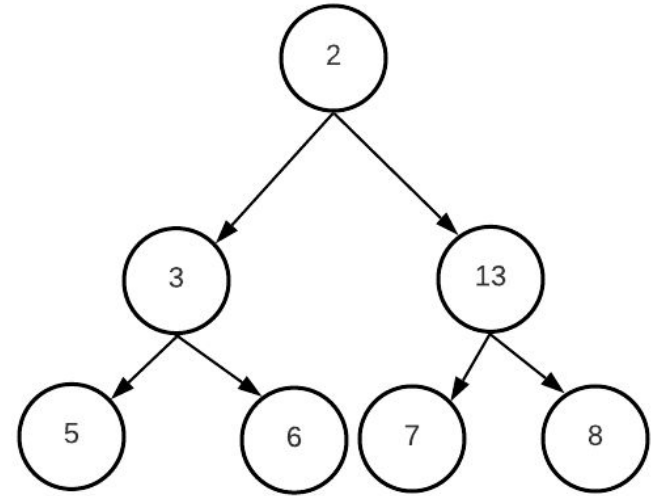- In the this tree, the answer is 3

Problem #5: Search the tree

- bool is_exists(int value)
- It returns true if this value exists
  - E.g. is_exists(13) ⇒ true
  - E.g. is_exists(70) ⇒ false

Problem #6: Is Perfect Tree

- bool is_perfect()
- It returns tree if the tree is perfect
- Develop it in 2 ways
  - Recursive way
  - Formula based-way

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."