Tree

Instructions for students:

- Complete the following methods on Tree.

- You may use any language to complete the tasks.

- All your methods must be written in one single .java or .py or .pynb file.
  DO NOT CREATE separate files for each task.

- If you are using JAVA, you must include the main method as well which
  should test your other methods and print the outputs according to the tasks.

- If you are using PYTHON, then follow the coding templates shared in this
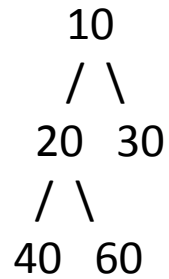
folder.

NOTE:

- **YOU CANNOT USE ANY BUILT-IN FUNCTION EXCEPT len IN
  PYTHON. [negative indexing, append is prohibited]**

- **YOU HAVE TO MENTION SIZE OF ARRAY WHILE INITIALIZATION**
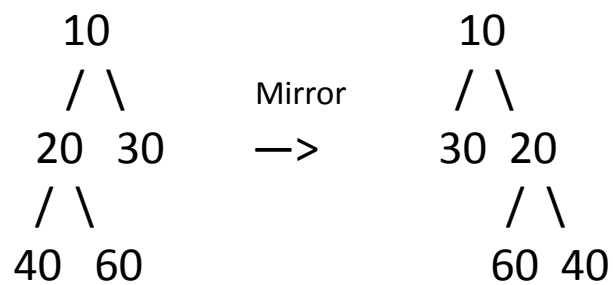
- **DO NOT USE LIST**

1. Mirror Mirror:

Given a binary tree, convert it into its mirror.

Sample Input:

```
      10
     / \
   20   30
   / \
  40   60
```

Sample Output:

```
      10                        10
     / \        Mirror         / \
   20   30        —>         30   20
   / \                             / \
  40   60                        60   40
```
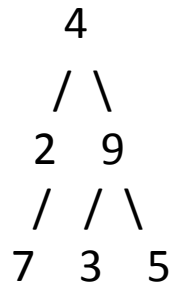
Inorder Traversal of mirror: 30 10 60 20 40

2. Level Max:

Given a binary tree, find the largest value in each level.

Sample Input:

```
        4
       / \
      2   9
     / / \
    7  3  5
```

Sample Output: 4 9 7

Explanation:

There are 3 levels in the tree

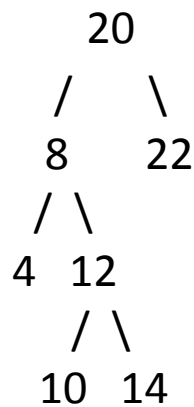Level 0: {4}, max = 4

Level 1: {2, 9}, max = 9

Level 2: {3, 5, 7}, max = 7

3. Inorder Successor:

Given a BST, and a reference to a Node x in the BST, find the Inorder Successor of the given node in the BST.
DO NOT USE LIST
Sample Input:

```
          20
         /    \
        8      22
       / \
      4  12
         / \
       10  14
```

x = reference of the node containing 8
Sample Output: reference of the node 10

Explanation:
The inorder successor of a parent node is the smallest (leftmost) node in the right subtree. The leftmost node in the right subtree of parent node 8 is 10.
Another explanation is that, the inorder traversal of the given tree:
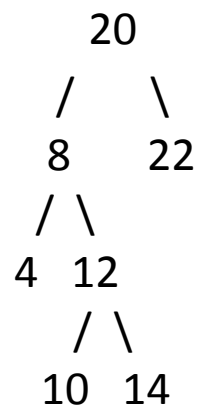4 8 10 12 14 20 22
Hence, the inorder successor of 8 is 10.

4. Kth Smallest:

Given a Binary search tree, your task is to complete the function which will return the Kth smallest element without doing any modification in the Binary Search Tree.
DO NOT USE LIST

Sample Input:

```
         20
        /    \
       8     22
      / \
     4  12
        / \
      10  14
```
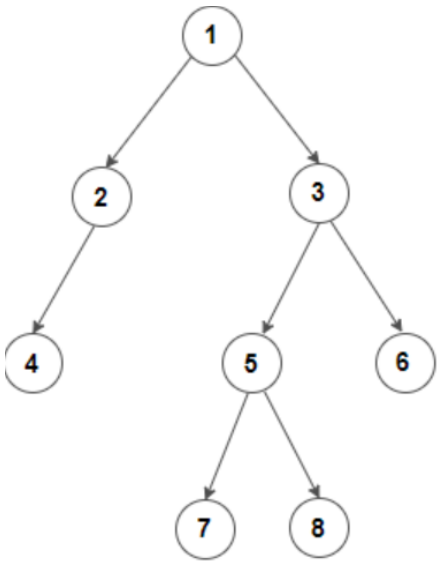
k = 2
Sample Output: 8

Ungraded Bonus Task:

Given a Binary Tree, Write a function that finds the difference between sum of all nodes present at odd and even levels in a binary tree, i.e. sum of all even level nodes - sum of all odd level nodes.

Sample Input:	Sample Output	Explanation
	-4	1-2-3+4+5+6-7-8 = -4