HW2 (Group Homework)

1. Drawing an upside down triangle (10 pts)

Problem Description:

Write a **recursive method** called drawTriangle() that outputs lines of '*' to form an upside down isosceles triangle. Method drawTriangle() has one parameter, an integer representing the base length of the triangle. Assume the base length is always odd and less than 20. Output 9 spaces before the first '*' on the last line for correct formatting.

Hint: The number of '*' decreases by 2 for every line drawn.

Example 1: If the input of the program is:

```
3
```

the method drawTriangle() outputs:

```
         ***
          *
```

Note: 8 spaces before the first '*' on the first line when the base length is 3, and 9 spaces before the first '*' on the last line.

Example 2: If the input of the program is:

```
19
```

the method drawTriangle() outputs:

```
*******************
 *****************
  ***************
   *************
    ***********
     *********
      *******
       *****
        ***
         *
```

Note: No space is output before the first '*' on the first line when the base length is 19.

Here's a default template:

```
import java.util.Scanner;

public class LabProgram {

  public static void main(String[] args) {
    Scanner scnr = new Scanner(System.in);
    int baseLength;

    baseLength = scnr.nextInt();
    drawTriangle(baseLength);
  }

  /* TODO: Write recursive drawTriangle() method here. */


}
```

(8 pts) Coding: (Copy and Paste Source Code here.)

(2 pts) Testing: (Paste the screenshot of your result here. And describe how you test this program)

2. Search in a Regular Binary Tree (7 pts)

Problem Description:

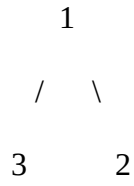
Create a **method** to search a tree node with target value in regular binary tree, Return the value if this value exists in the binary tree. Return null if not exists.

Example 1:

Input: {1, 3, 2}, and target value = 3

Output: 3

Explanation: there's a tree node with target value in this binary tree.

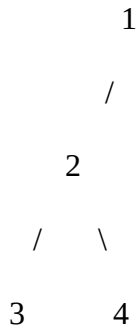


Example 2:

Input: {1, 2, #, 3, 4}, and target value = 3

Output: 3

Explanation: there's a tree node with target value in this binary tree.



(5 pts) Coding: (Copy and Paste Source Code here.)

(2 pts) Testing: (Paste the screenshot of your result here. And describe how you test this program)

3. Search in a Binary Search Tree (8 pts)

Problem Description:

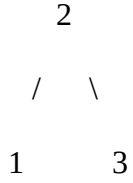
Create a **bianry search method** to search a tree node with target value in a binary search tree (BST), Return the value if this value exists in the BST. Return null if not exists.

Example 1:

Input: {2, 1, 3}, and target value = 3

Output: 3

Explanation: there's a tree node with target value in this BST.

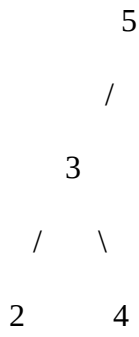


Example 2:

Input: {5, 3, #, 2, 4}, and target value = 3

Output: 3

Explanation: there's a tree node with target value in this BST.



(6 pts) Coding: (Copy and Paste Source Code here.)

(2 pts) Testing: (Paste the screenshot of your result here. And describe how you test this program)