Algorithms and Data Structures I - Fall 2018 - Programming Assignment 4

Lab 4: Binary Search Trees

Directions: This assignment will be demoed in lab on Thursday, November 15th or Friday, November 16th.

Assignment Details: Your task in this lab is to implement a `BinarySearchTree` class in C++ that can hold `int` values. Your class should define the following public methods:

1. `void insert(int i)` - Insert integer `i` into the Binary Search Tree
2. `void printTheNodesOrNone()` - Traverse the binary tree. Print (to standard output) the value of every node whose parent has a value that is a multiple of five, or "None" if no such nodes exist.

It is up to you to choose appropriate data structures to manage internal state of your `BinarySearchTree` class. For a detailed description of implementation options, see chapter 5 of A Practical Introduction to Data Structures and Algorithm Analysis. In particular, for two possible structural implementation approaches, see sections 5.3.1 (Pointer-Based Node Implementations) and 5.3.3 (Array Implementation for Complete Binary Trees) You may choose either option or one of your own design.

Deliverable:

C++ code that compiles to a single executable (for example: `a.out`). This executable should accept as command-line arguments a list of integers. Output the value of every node whose parent has a value that is a multiple of five, or "None" if no such nodes exist.

```
$ ./a.out 10 4 -8 5 11
4 11

$ ./a.out 4 10 -8 5 11
11

$ ./a.out 1 3 4 11
None
```