CS 260 Programming Assignment #3
Due 11/17/14
Traversals of Binary Search Trees

Write a Python program that solves the following problem. First input a list of values that correspond to the level-order traversal of a binary search tree. Note: because this is a binary *search* tree rather than just any arbitrary binary tree, we can also infer its in-order traversal. (How?) Next build the binary search tree that has the given level-order traversal and the inferred in-order traversal. Finally output the in-order, pre-order, post-order, and level-order traversals in the format illustrated by the examples below.

Your program should behave as shown in the following examples. Note that the input traversal (shown in red) is a flat list, but each output traversal consists of nested lists that show the structure of the binary search tree.

```
Enter level-order as a Python list: [5,3,7]
In-Order:    [[3], 5, [7]]
Pre-Order:   [5, [3], [7]]
Post-Order:  [[3], [7], 5]
Level-Order: [[5], [3, 7]]
```

```
Enter level-order as a Python list: [5,3,7,2,4,6,8]
In-Order:    [[[2], 3, [4]], 5, [[6], 7, [8]]]
Pre-Order:   [5, [3, [2], [4]], [7, [6], [8]]]
Post-Order:  [[[2], [4], 3], [[6], [8], 7], 5]
Level-Order: [[5], [3, 7], [2, 4, 6, 8]]
```

```
Enter level-order as a Python list: [1,2,3,4,5,6]
In-Order:    [1, [2, [3, [4, [5, [6]]]]]]
Pre-Order:   [1, [2, [3, [4, [5, [6]]]]]]
Post-Order:  [[[[[[6], 5], 4], 3], 2], 1]
Level-Order: [[1], [2], [3], [4], [5], [6]]
```

```
Enter level-order as a Python list: [6,5,4,3,2,1]
In-Order:    [[[[[[1], 2], 3], 4], 5], 6]
Pre-Order:   [6, [5, [4, [3, [2, [1]]]]]]
Post-Order:  [[[[[[1], 2], 3], 4], 5], 6]
Level-Order: [[6], [5], [4], [3], [2], [1]]
```

```
Enter level-order as a Python list: [9,1,8,2,7,3,6,4,5]
In-Order:    [[1, [[2, [[3, [[4, [5]], 6]], 7]], 8]], 9]
Pre-Order:   [9, [1, [8, [2, [7, [3, [6, [4, [5]]]]]]]]]
Post-Order:  [[[[[[[[[5], 4], 6], 3], 7], 2], 8], 1], 9]
Level-Order: [[9], [1], [8], [2], [7], [3], [6], [4], [5]]
```