1 Exercises

Exercise 1. Consider inserting the following keys (assume values to be non `null` and arbitrary) into a binary search tree (ordered) symbol table `st`, an object of type `BST`.

```
S  Y  M  B  O  L  T  A  E  X  P
```

a. What is the binary search tree (BST) that results? List the keys along with their indices (starting at 1) in level order.

b. What is the height of the BST (assume root to be at height 0)?

c. What is the order in which the keys are visited if we traverse the BST in pre-order?

d. What is the order in which the keys are visited if we traverse the BST in in-order?

e. What is the order in which the keys are visited if we traverse the BST in post-order?

f. What is the order in which the keys are visited if we traverse the BST in level-order?

g. What is the BST that results if we delete the smallest key from the initial tree?

h. What is the BST that results if we delete the largest key from the initial tree?

i. What is the BST that results if we delete the key `B` from the initial tree?

2 Solutions to Exercises

Solution 1.

a. `1: S, 2: M, 3: Y, 4: B, 5: O, 6: T, 8: A, 9: L, 11: P, 13: X, 18: E`

b. 4

c. `S  M  B  A  L  E  O  P  Y  T  X`

d. `A  B  E  L  M  O  P  S  T  X  Y`

e. `A  E  L  B  P  O  M  X  T  Y  S`

f. `S  M  Y  B  O  T  A  L  P  X  E`

g. `1: S, 2: M, 3: Y, 4: B, 5: O, 6: T, 9: L, 11: P, 13: X, 18: E`

h. `1: S, 2: M, 3: T, 4: B, 5: O, 7: X, 8: A, 9: L, 11: P, 18: E`

i. `1: S, 2: M, 3: Y, 4: E, 5: O, 6: T, 8: A, 9: L, 11: P, 13: X`