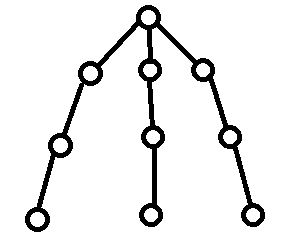
**CPT\_S 580 HW3**

**Yang Zhang**

**11529139 (graduate)**

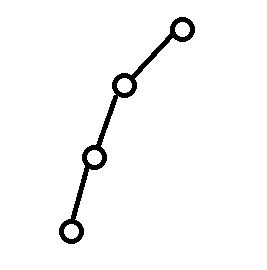
**3.2.10**

A ternary tree of height 3 with 10 vertices.



**3.2.12**

A ternary tree of height 3 with 4 vertices.



**3.3.1**

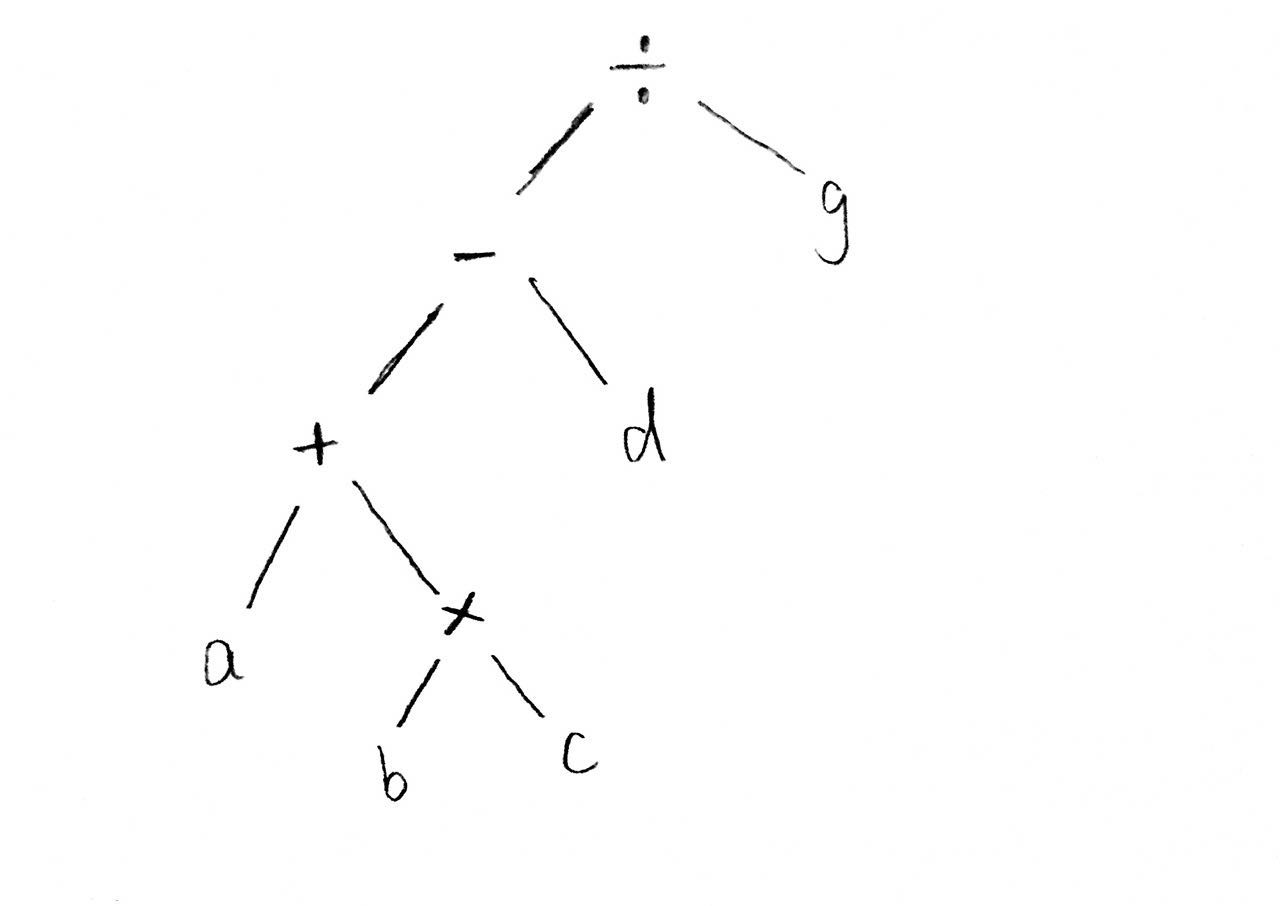
Level-order: {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

Pre-order: {1, 2, 4, 7, 8, 5, 3, 6, 9, 10}

In-order: {7, 4, 8, 2, 5, 1, 9, 6, 10, 3}

Post-order: {7, 8, 4, 5, 2, 9, 10, 6, 3, 1}

**3.3.6**



Prefix: {/, -, +, a, \*, b, c, d, g}

Postfix: {a, b, c, \*, +, d, -, g, /}

**3.5.2**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| letter | a | b | c | d | e | f | g |
| codeword | 00 | 0100 | 0101 | 011 | 10 | 110 | 111 |

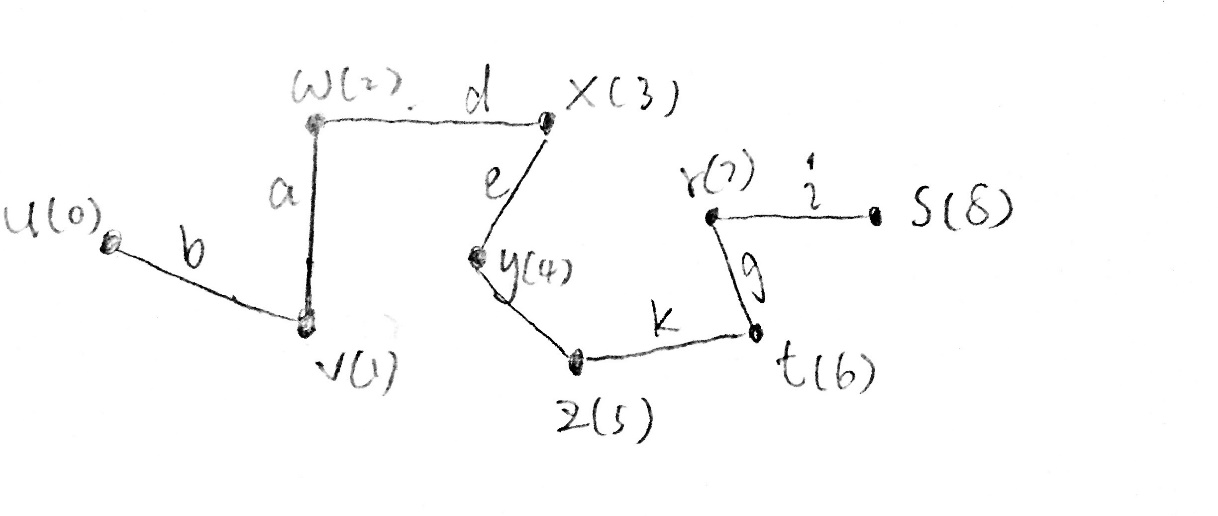
0100|00|111|111|00|111|10 = baggage

**4.1.2**

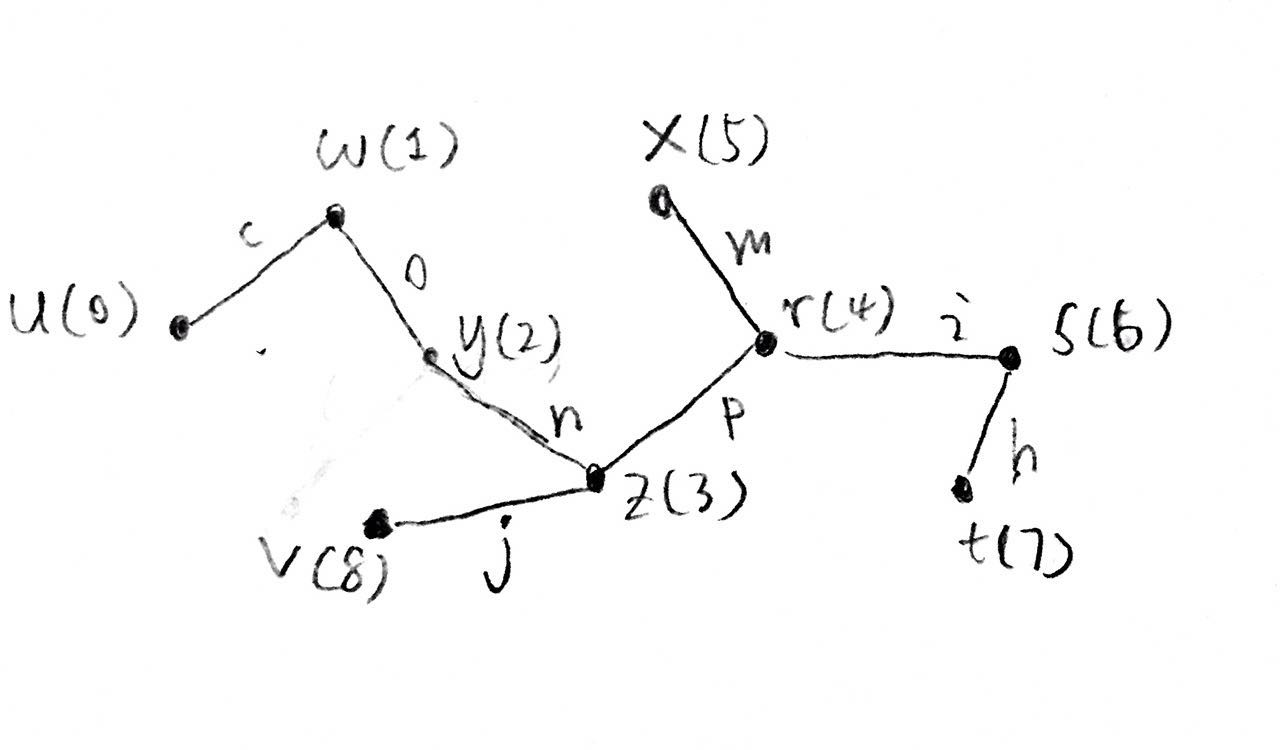
Frontier edges (one endpoint in the tree): {l, e, m, g, h}

**4.2.2**

**(a) lexicographic order:**

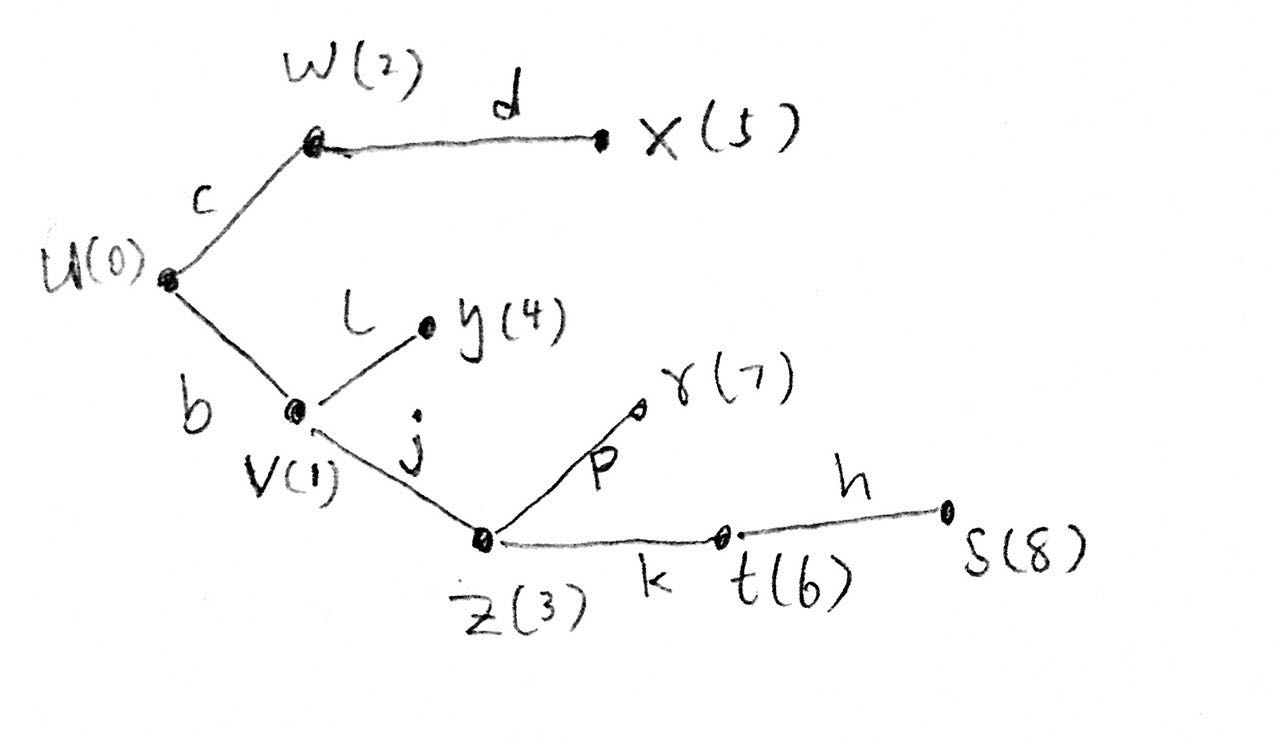
****

**(b) reverse lexicographic order:**

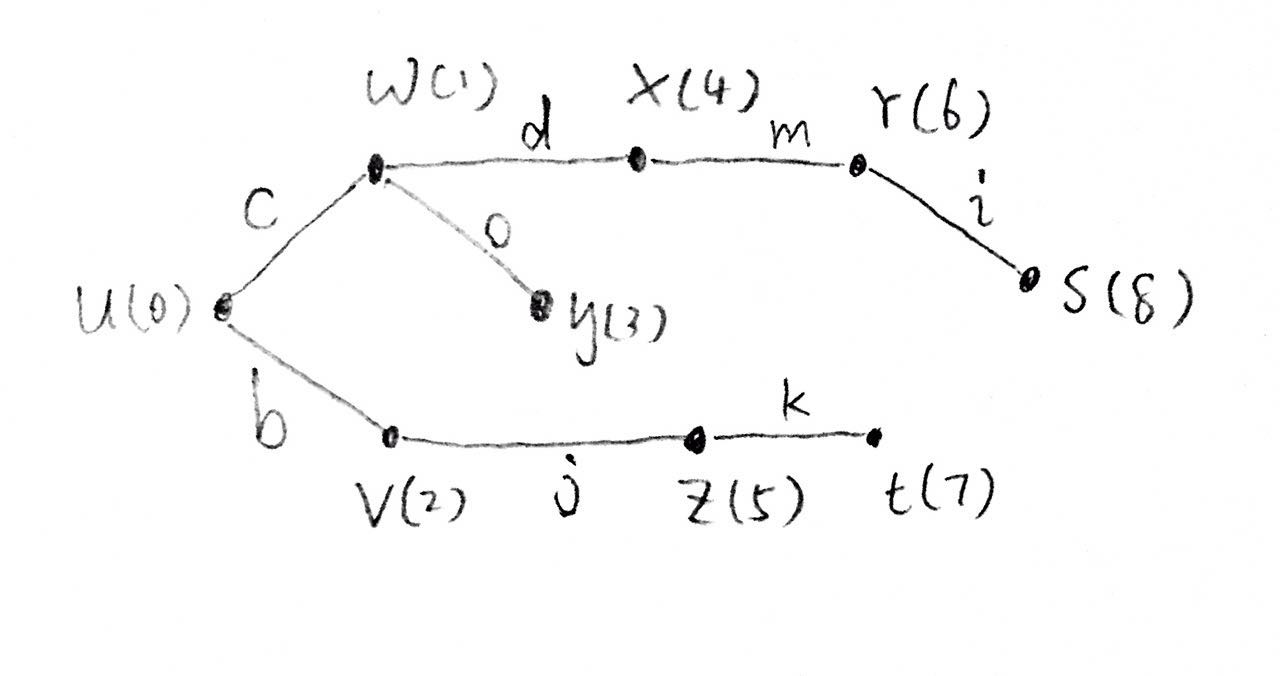
****

**4.2.9**

**(a) lexicographic order:**

****

**(b) reverse lexicographic order:**

****

**3.4.16**

According to the definition of BST, any value from the left subtree must be smaller than current root value. Start from the root **r**, the value of left child **c1** of the root is smaller than the value of root, and then the left child **c2** is smaller than the value of **c1.** Repeating the step until it reaches the leaf node which is the left most leaf node. Therefore, the left leaf node is the smallest in BST.

**4.1.17**

The tree-growing algorithm discover new vertex based on the vertex it already discovered, and the algorithm discover vertex by tracking the edge that contains the vertices it already discovered. Therefore, the new discovered vertices must be connected to those old discovered vertices.

By the process of tree-growing algorithm