Beihang University
School of General Engineering

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Computer Science and Programming
Homework December 7th, 2020

Task 1 *Counting Sort*

Write a function *counting_sort(L,k)* to sort a list L within linear time. Here, all elements in L are integers in the range 0 to k. Try your algorithm on $L = [2, 5, 3, 0, 2, 3, 0, 3]$, with $k = 6$.

Task 2 *A Warm-up for Binary Search Tree*

Please read and understand the following short code snippet for storing a tree in Python.

```
class Node:
    def __init__(self,data=None,left=None,right=None):
        self.data = data
        self.left = left
        self.right = right

Tree1 = Node(2, Node(1),Node(3))
```

1. Use the class structure above to create the BST visualized in Figure 4.
2. Implement a function that prints all elements in a tree by infix-order traversal. Infix means that the left children are explored first, then the data of a node is printed, and finally the right children are explored further.
3. Implement a function that prints all elements in a tree by pre-order traversal. Pre-order suggests that the data of a node is printed first, and then we recursively explore its left child and finally recursively explore its right child.

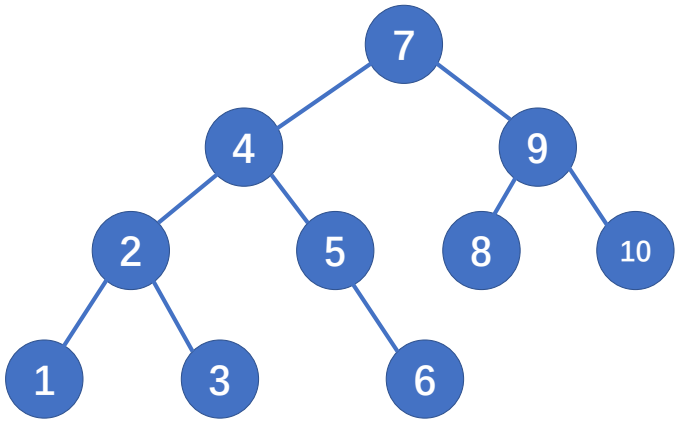

Figure 4: An example for BST