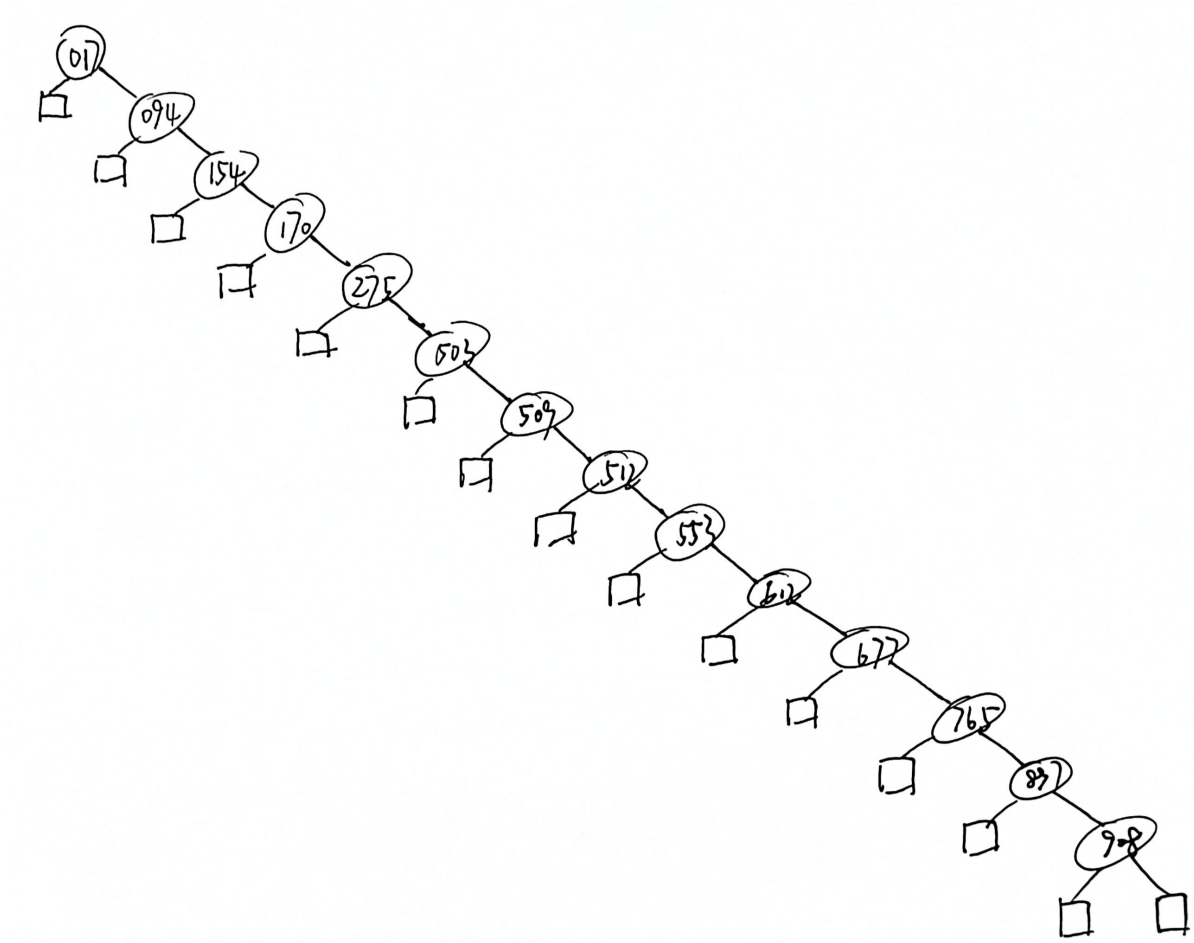
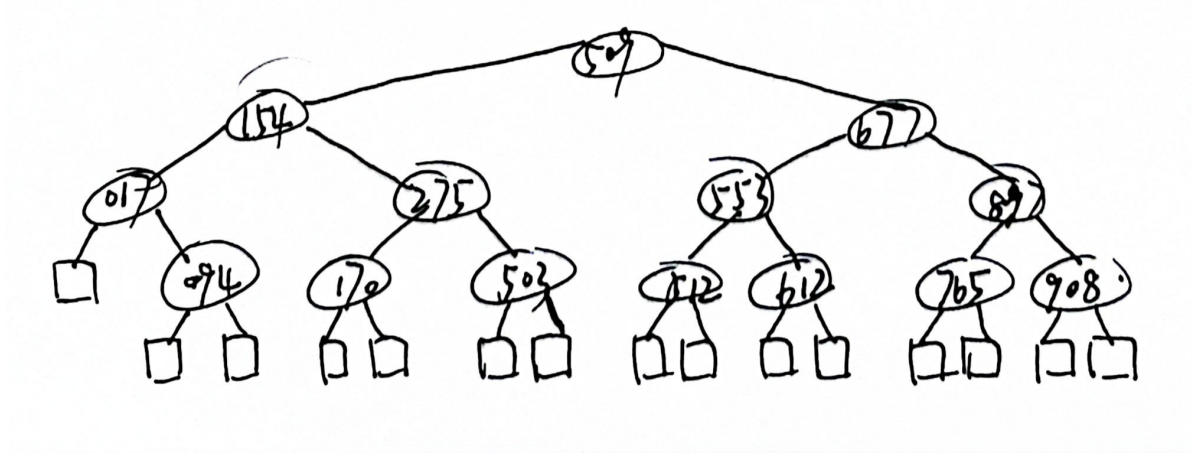
7.2



$$ASL_{succ} = \frac{1}{14}\sum_{0}^{13}(n+1) = \frac{15}{2}$$
$$ASL_{unsucc} = \frac{1}{15}(14 + \sum_{1}^{14} n) = \frac{119}{15}$$

7.3



$$ASL_{succ} = \frac{1}{14}(1 \times 1 + 2 \times 2 + 4 \times 3 + 7 \times 4) = \frac{45}{14}$$
$$ASL_{unsucc} = \frac{1}{15}(1 \times 3 + 14 \times 4) = \frac{59}{15}$$

7.4

(1)

不同。有序顺序表的平均搜索长度

$$ASL_{unsucc} = \frac{1+2+\cdots+n+n}{n+1} = \frac{n}{2} + \frac{n}{n+1}$$

无序顺序表的平均搜索长度

$$ASL_{unsucc} = n$$

(2)

相同。有序顺序表和无序顺序表的平均搜索长度

$$ASL_{succ} = \frac{1+2+\cdots+n}{n} = \frac{n+1}{2}$$

(3)

不同。假设关键码值为k的元素有m个，有序顺序表的平均搜索长度

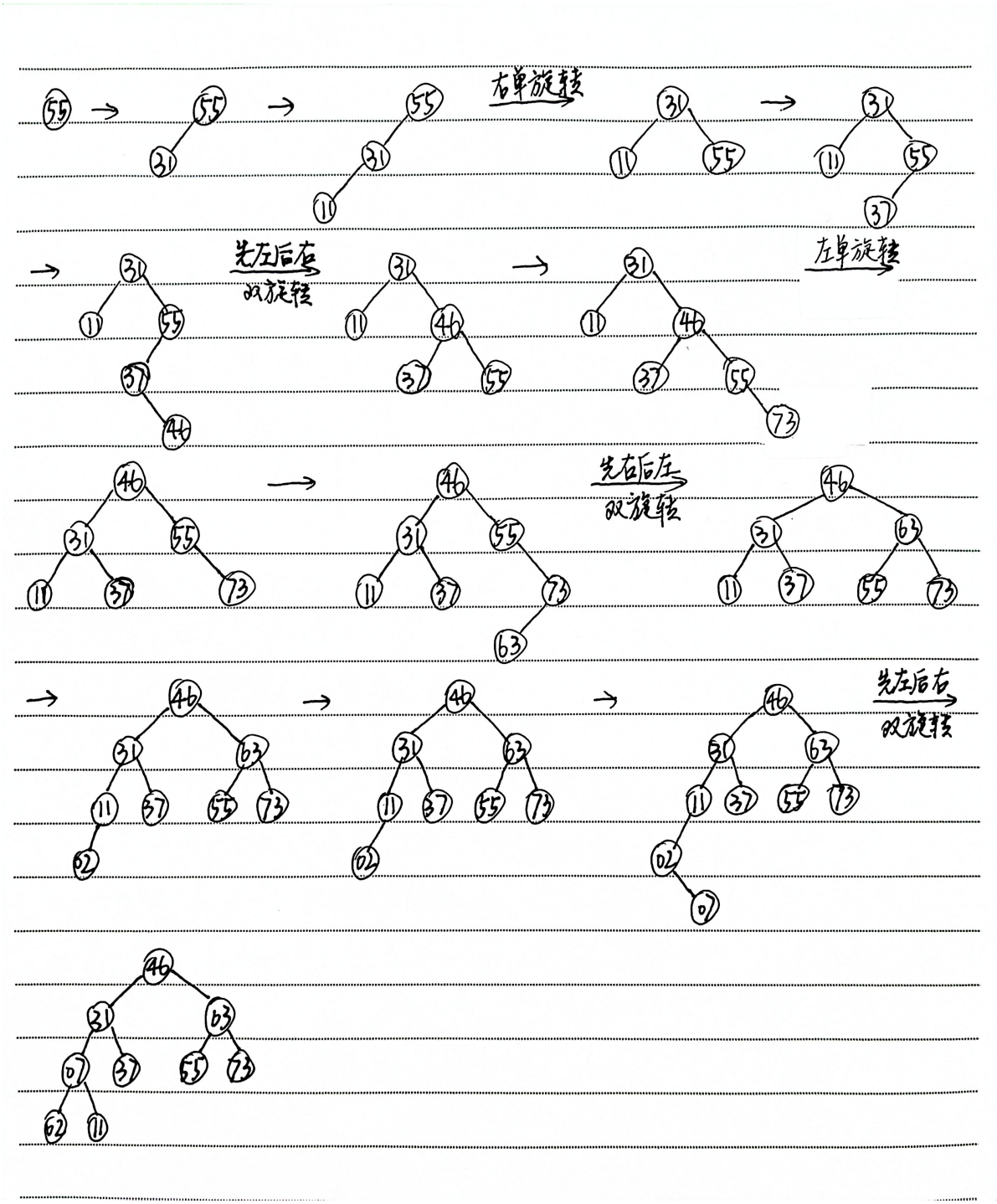
$$ASL_{succ} = \frac{1+2+\cdots+(n-m+1)}{n-m+1} + (m-1) = \frac{n+m}{2}$$

无序顺序表的平均搜索长度

$$ASL_{succ} = n$$

7.14

(1)



(2)

$$ASL_{succ} = \frac{1}{9}(1 \times 1 + 2 \times 2 + 4 \times 3 + 2 \times 4) = \frac{25}{9}$$

$$ASL_{unsucc} = \frac{1}{10}(6 \times 3 + 4 \times 4) = \frac{17}{5}$$

7.28

```
template <class T>
void BSTree<T>::Remove(T x, BSTreeNode<T>*& ptr) {
    if (ptr == NULL) return;
    if (x < ptr->data) Remove(x, ptr->leftChild);
    else if (x > ptr->data) Remove(x, ptr->rightChild);
    else if (ptr->leftChild != NULL && ptr->rightChild != NULL) {
        srand((unsigned)time(NULL));
```

```
        if (rand() % 2) {
            BSTreeNode<T>* temp = ptr -> leftChild;
            while (temp->rightChild != NULL) temp = temp->rightChild;
            ptr->data = temp->data;
            Remove(ptr->data, ptr->leftChild);
        }
        else {
            BSTreeNode<T>* temp = ptr->rightChild;
            while (temp->leftChild != NULL) temp = temp->leftChild;
            ptr->data = temp->data;
            Remove(ptr->data, ptr->rightChild);
        }
    }
    else {
        BSTreeNode<T>* temp = ptr;
        ptr = (ptr->leftChild != NULL) ? ptr->leftChild : ptr->rightChild;
        delete temp;
    }
}
```