

12-XB3

优先级队列

左式堆：合并算法

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LeftHeap

❖ `template <typename T> //基于二叉树，以左式堆形式实现的优先级队列`

```
class PQ_LeftHeap : public PQ<T>, public BinTree<T> {
```

```
public:
```

```
    T getMax() { return _root->data; }
```

```
    void insert(T); T delMax(); //均基于统一的合并操作实现...
```

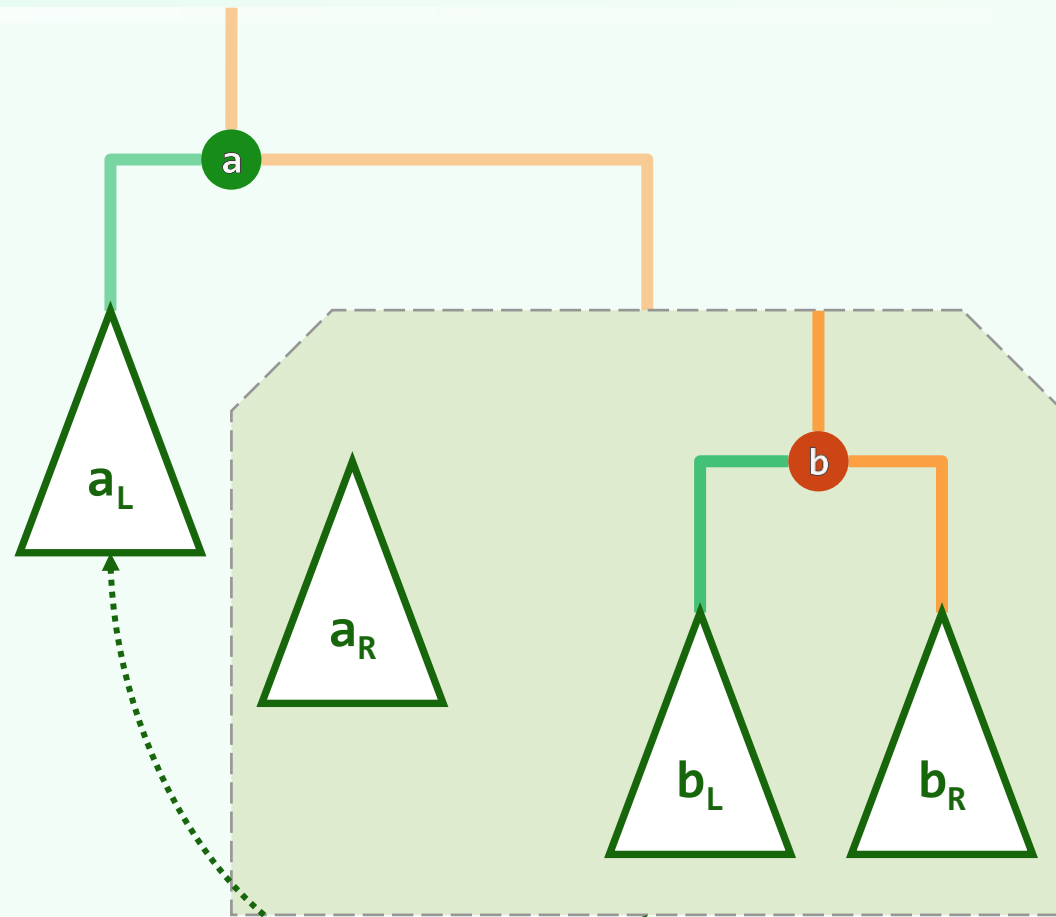
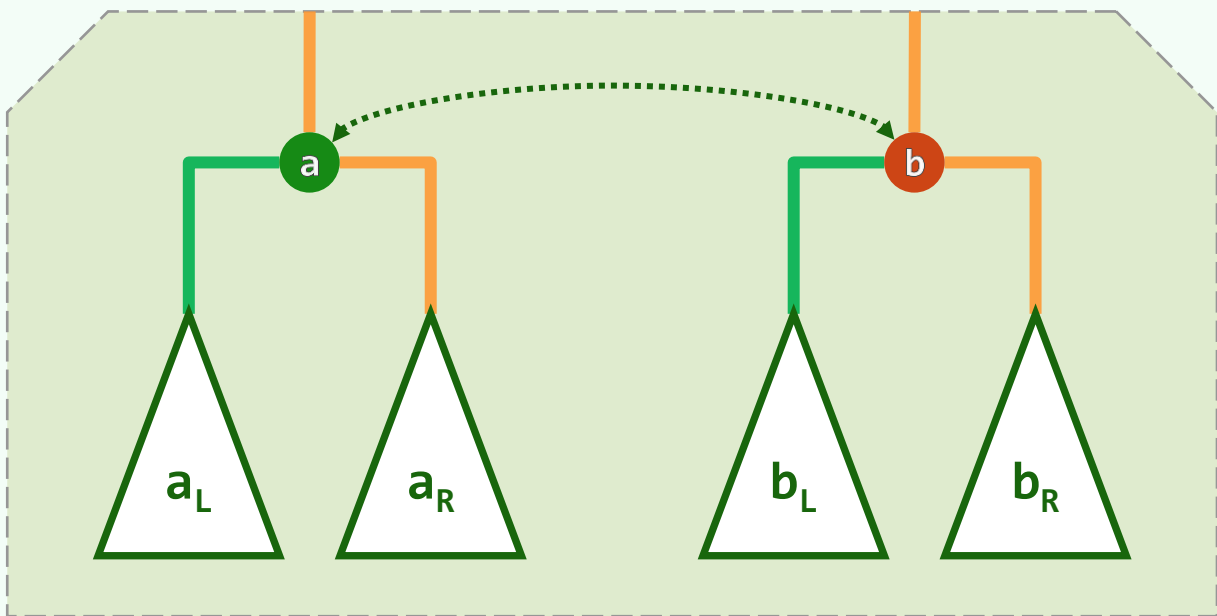
```
};
```

❖ `template <typename T>`

```
static BinNodePosi(T) merge( BinNodePosi(T), BinNodePosi(T) );
```

递归：前处理 + 后处理

Before:
compare priority &
swap if necessary



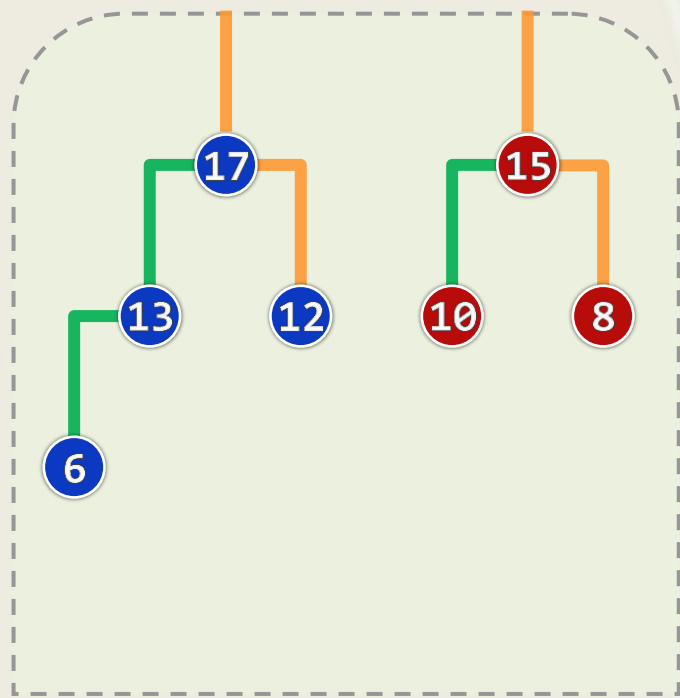
After:
compare NPL &
swap if necessary

实现

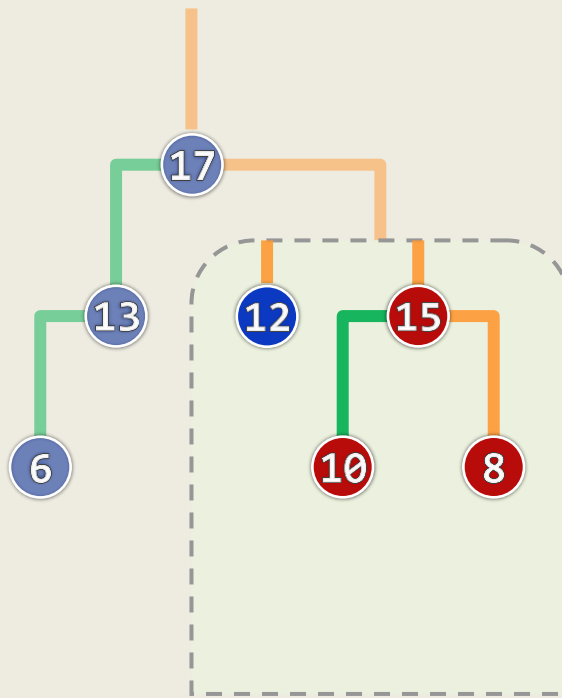
❖ template <typename T>

```
static BinNodePosi(T) merge( BinNodePosi(T) a, BinNodePosi(T) b ) {  
    if ( !a ) return b; if ( !b ) return a; //递归基  
    if ( lt( a->data, b->data ) ) swap( b, a ); //确保a不小  
    ( a->rc = merge( a->rc, b ) )->parent = a; //将a的右子堆, 与b合并  
    if ( ! a->lc || a->lc->npl < a->rc->npl ) //若有必要  
        swap( a->lc, a->rc ); //交换a的左、右子堆, 以确保左子堆的npl不小  
    a->npl = a->rc ? 1 + a->rc->npl : 1; //更新a的npl  
    return a; //返回合并后的堆顶  
}
```

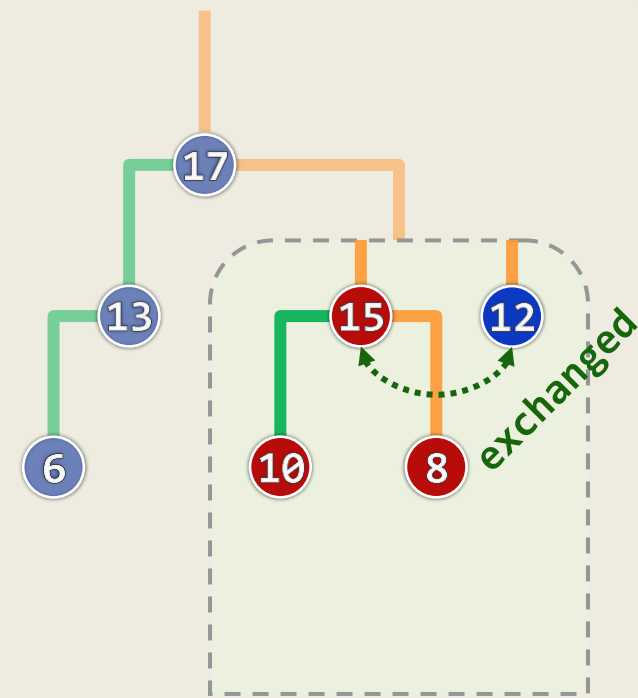
实例 (1/5)



(a)

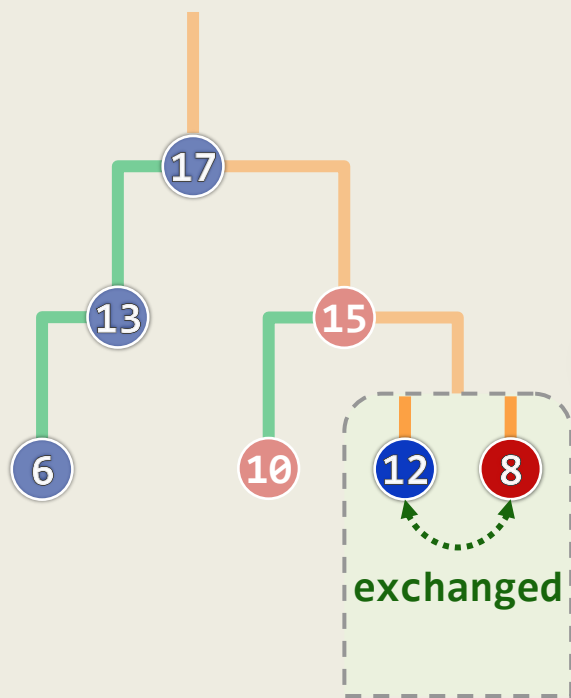


(b)

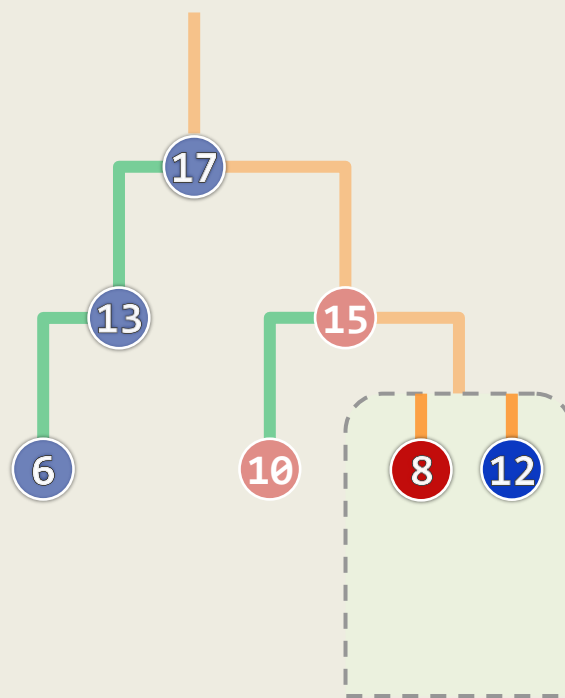


(c)

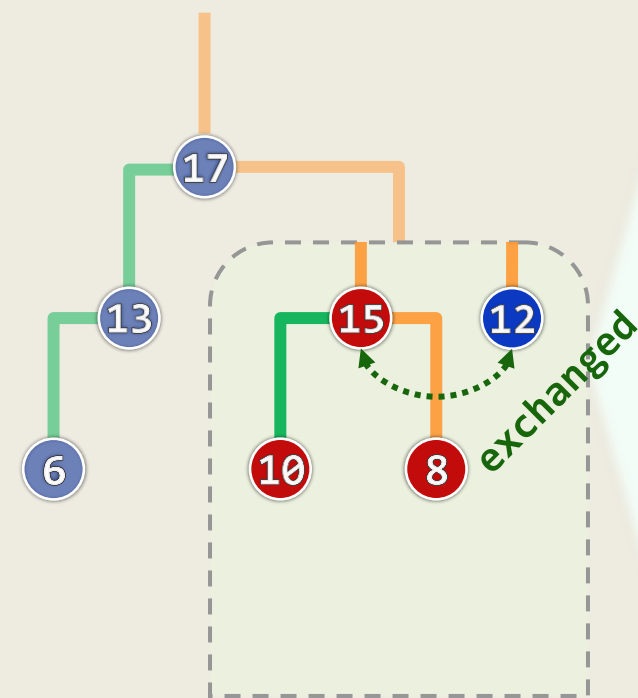
实例 (2/5)



(e)

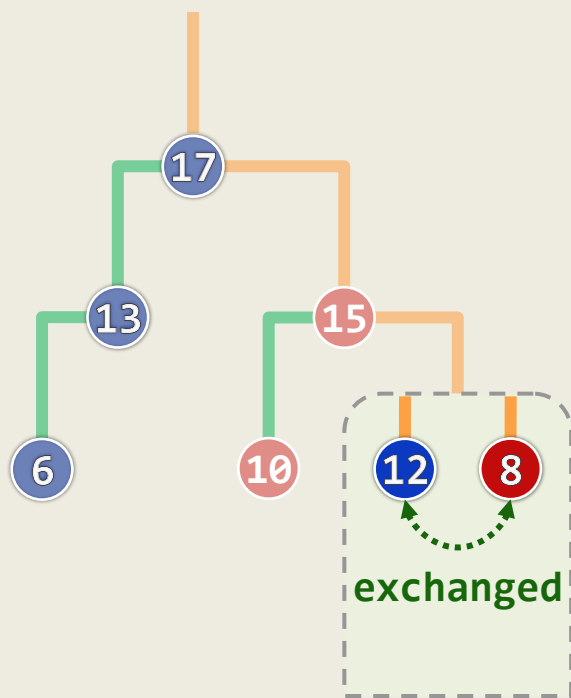


(d)

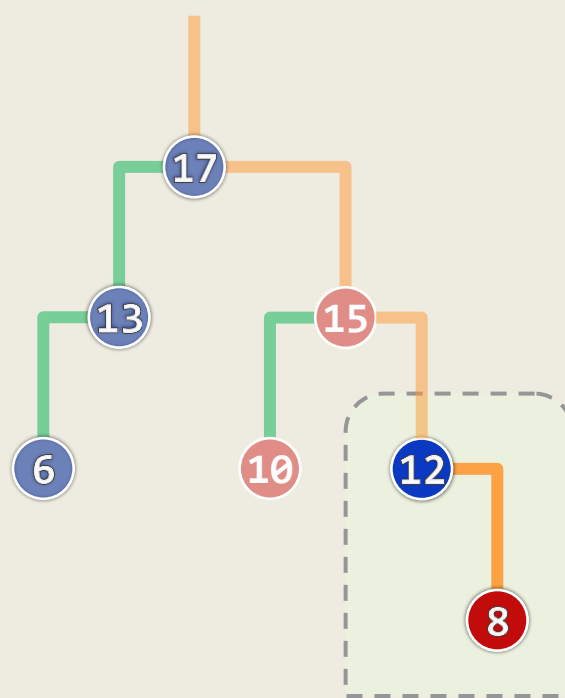


(c)

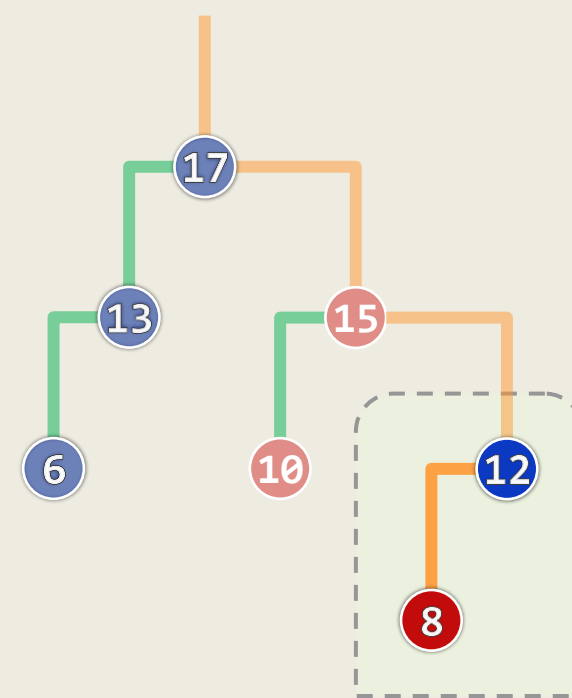
实例 (3/5)



(e)

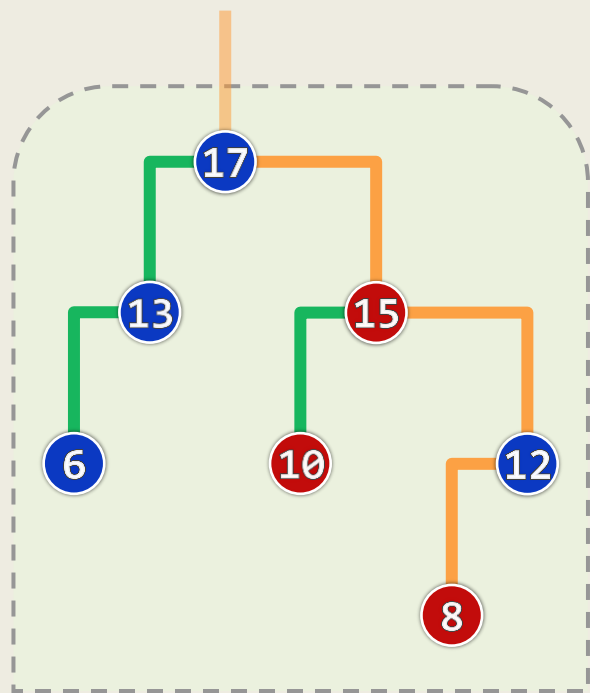


(f)

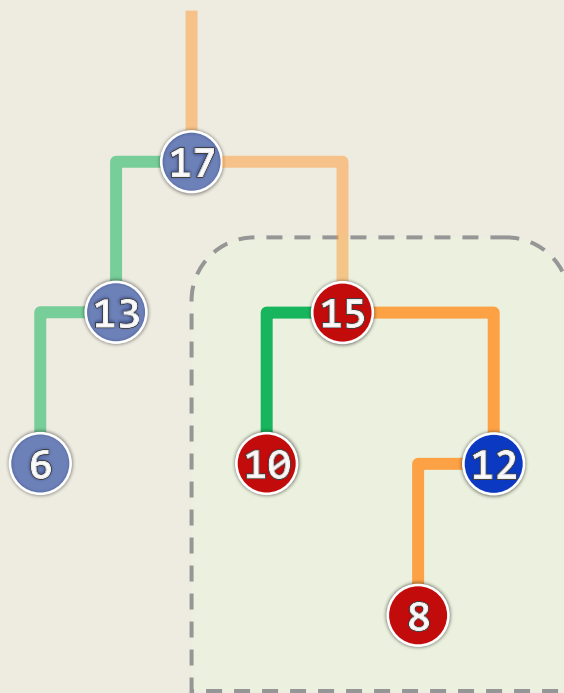


(g)

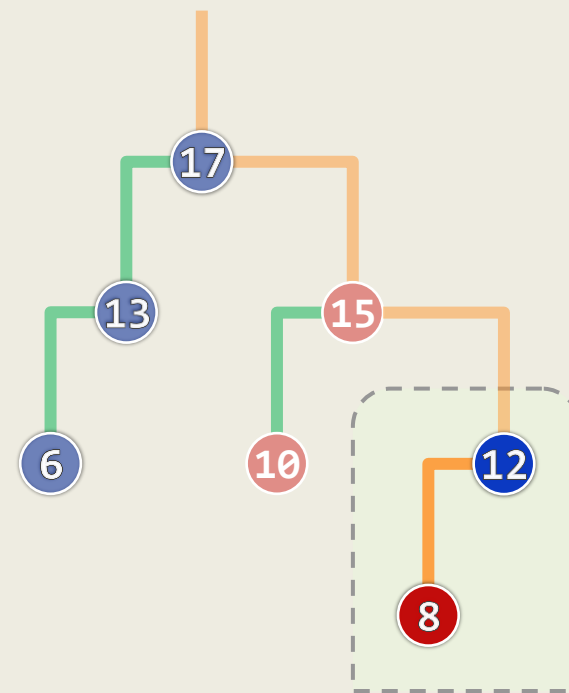
实例 (4/5)



(i)

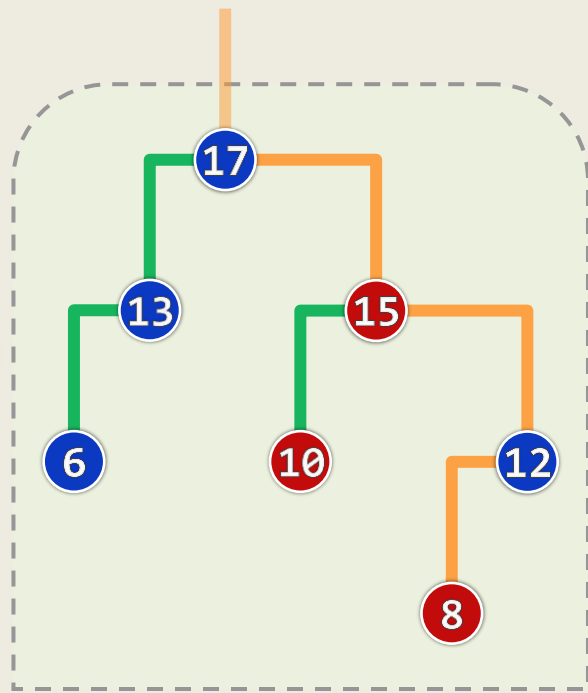


(h)

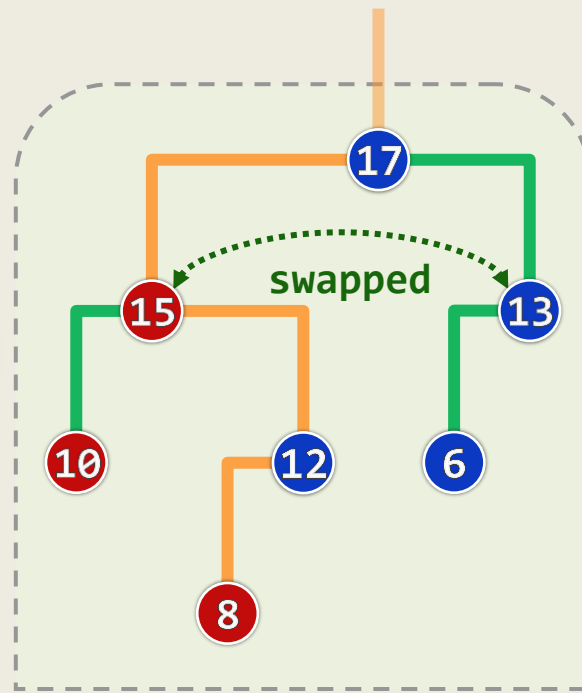


(g)

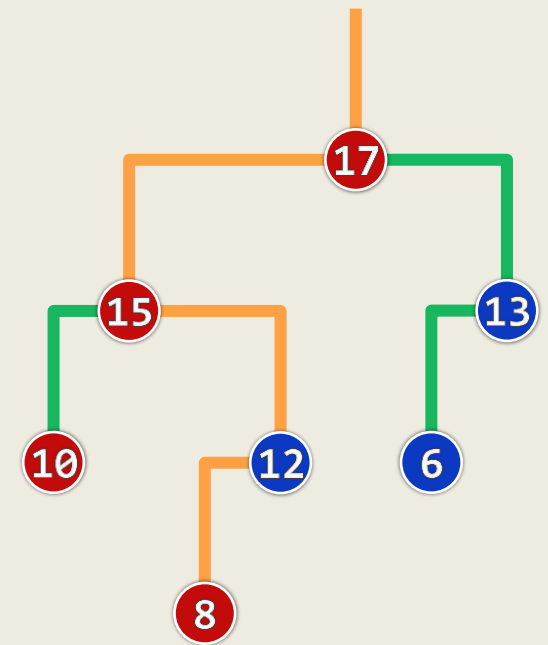
实例 (5/5)



(i)



(j)



(k)