

12-B3

优先级队列

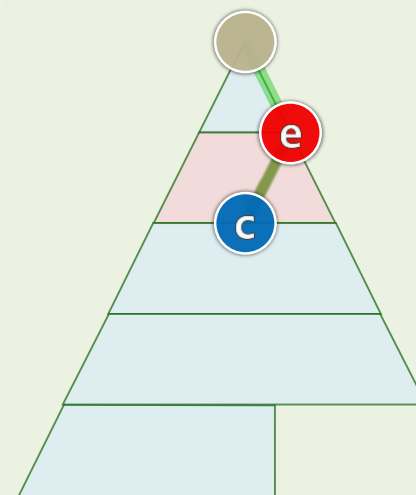
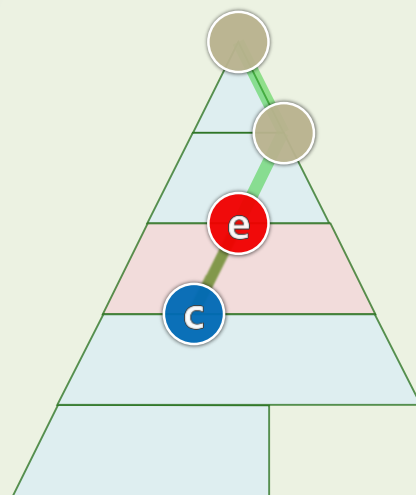
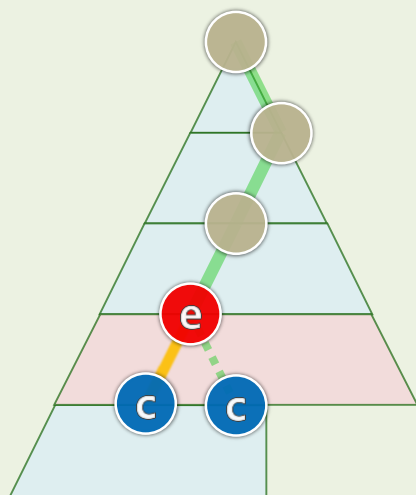
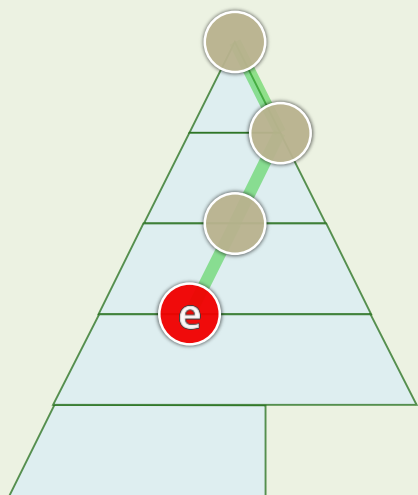
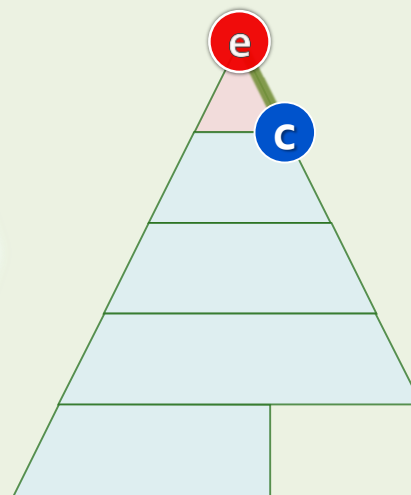
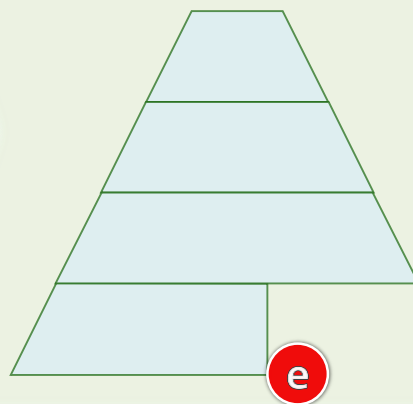
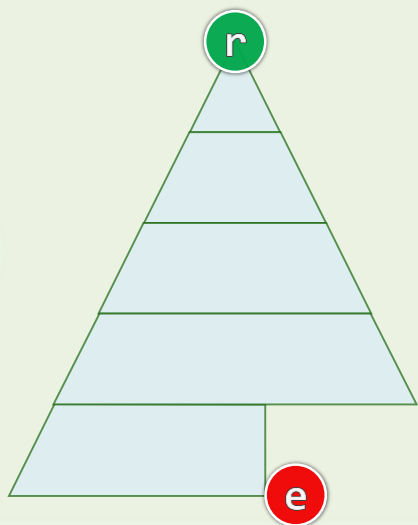
完全二叉堆：删除

I have scaled the peak and
found no shelter in
fame's bleak and barren height.

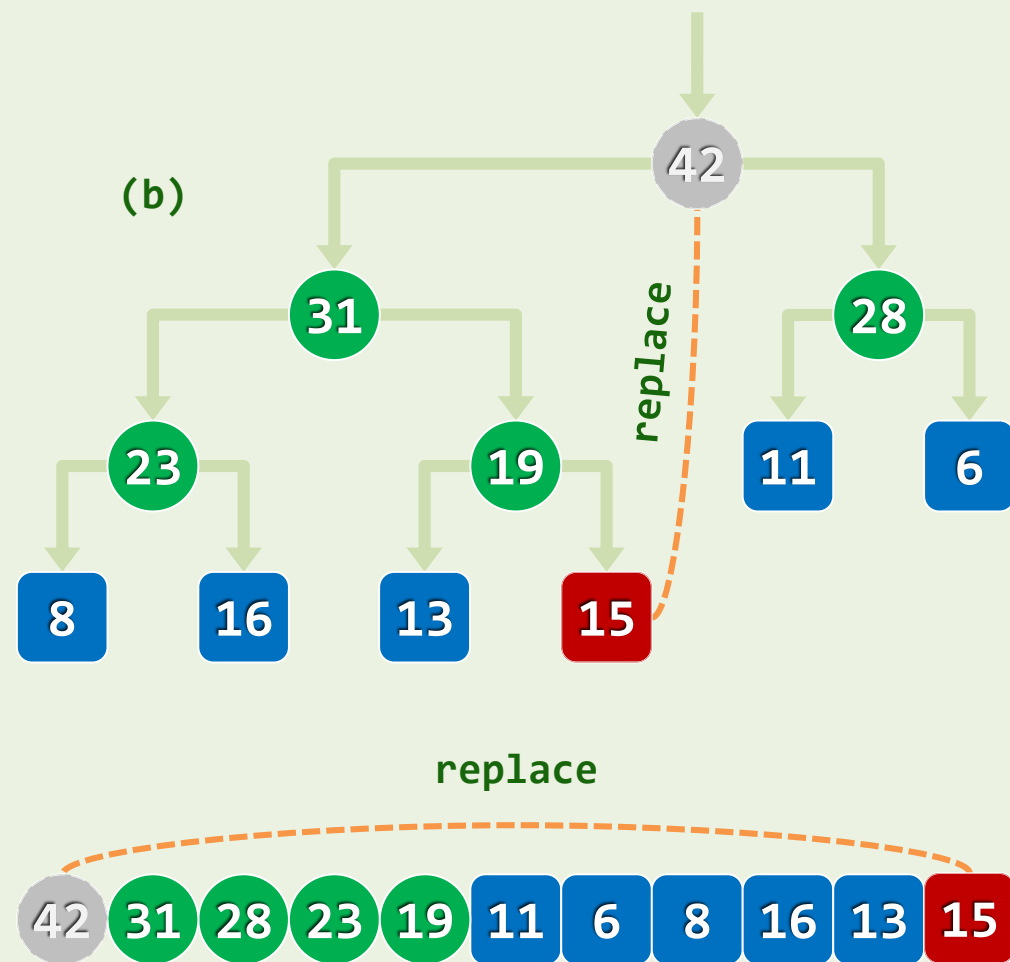
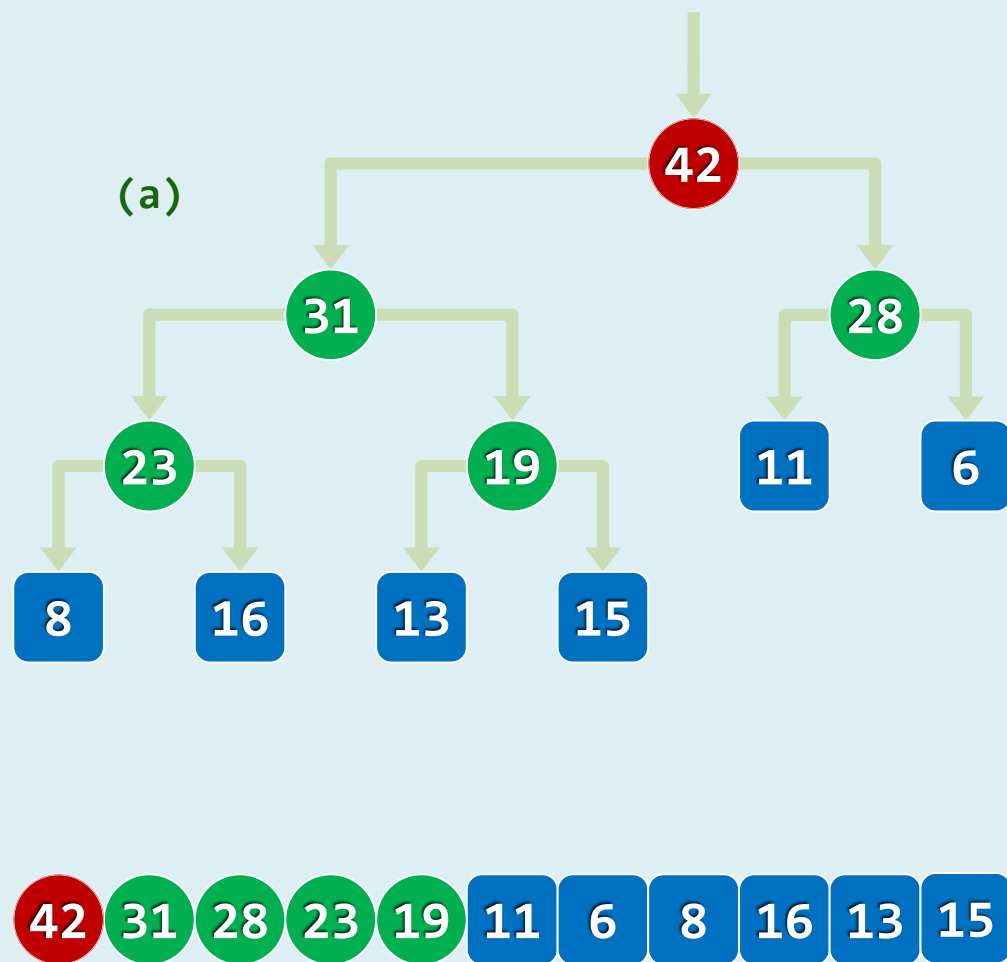
邓俊辉

deng@tsinghua.edu.cn

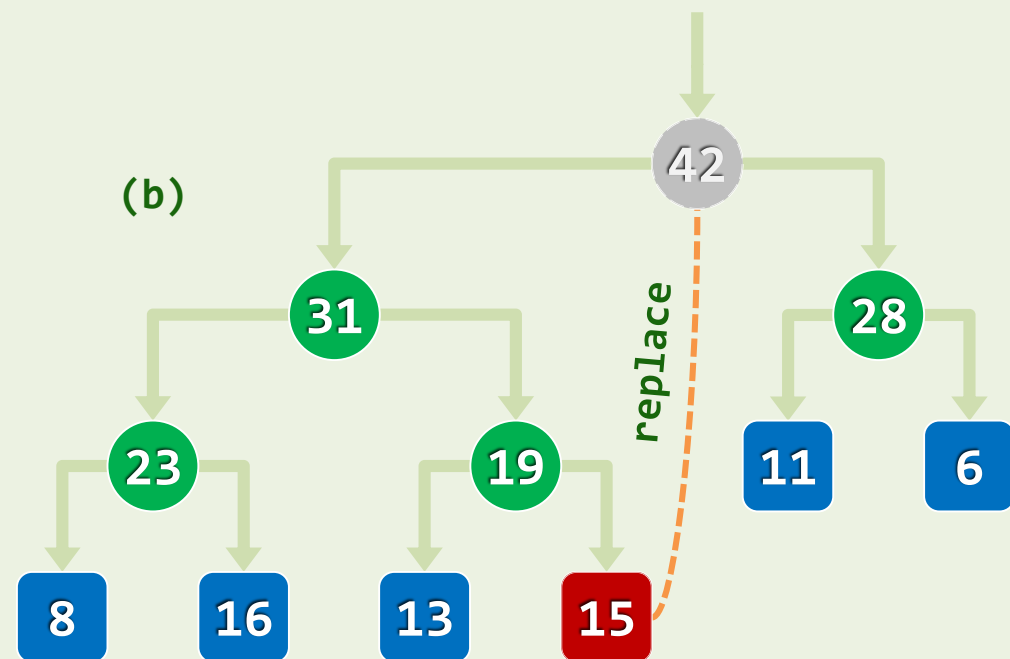
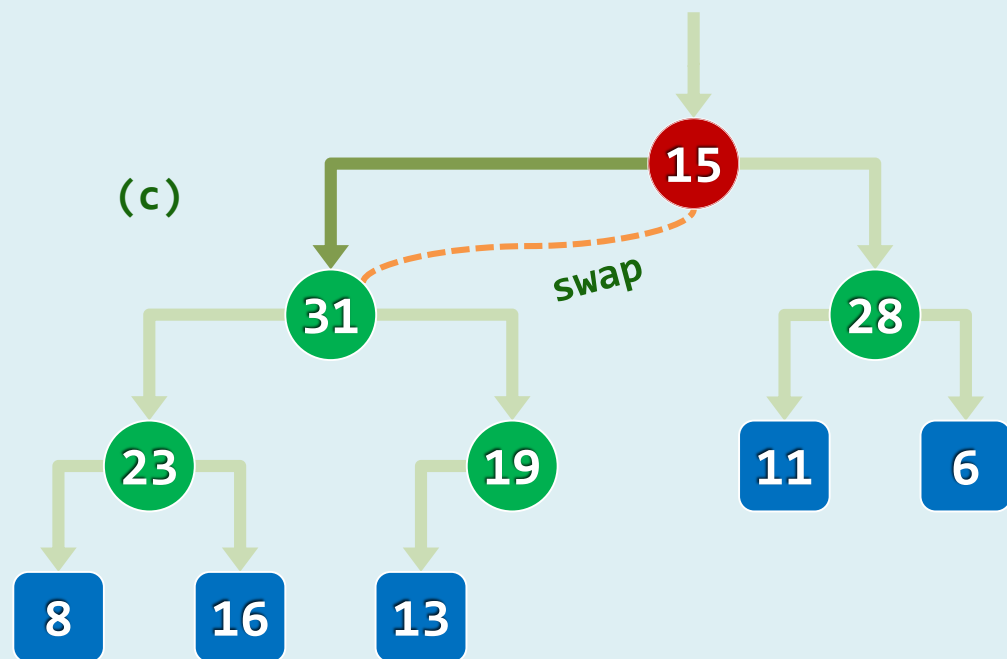
算法：割肉补疮 + 逐层下滤



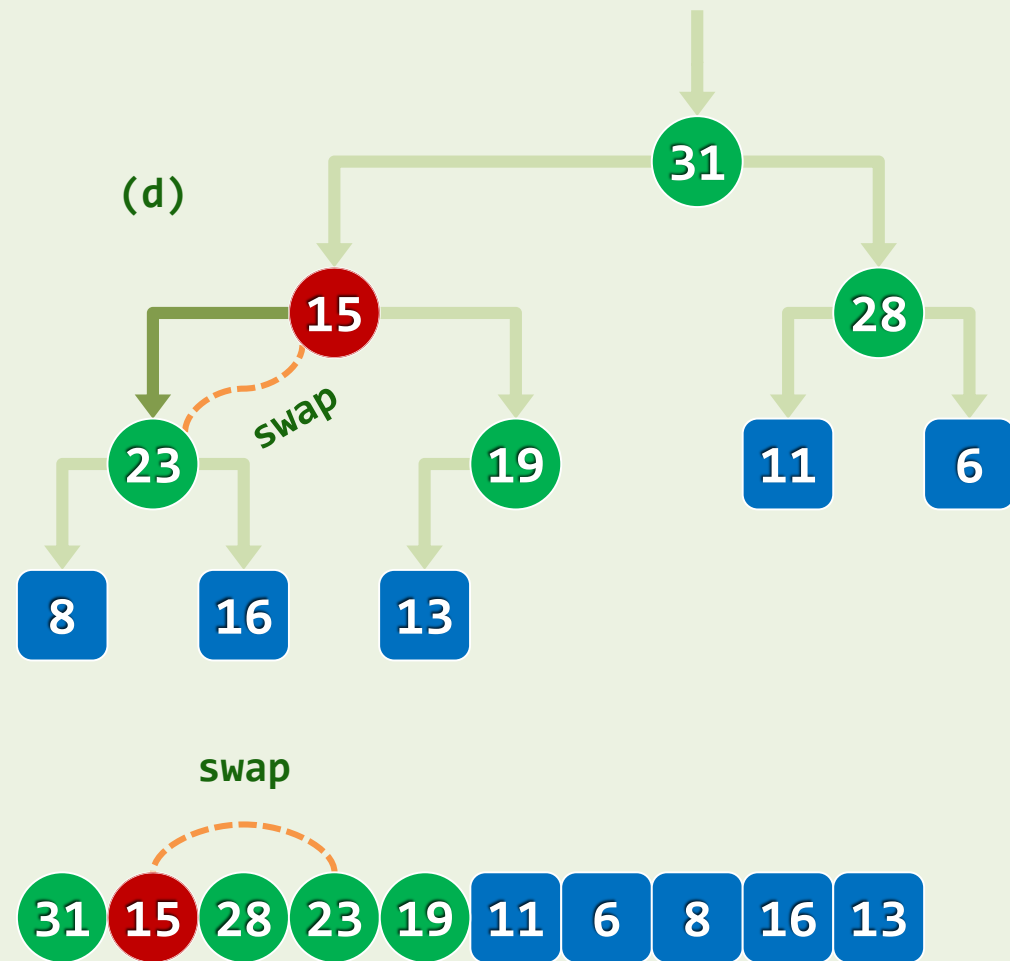
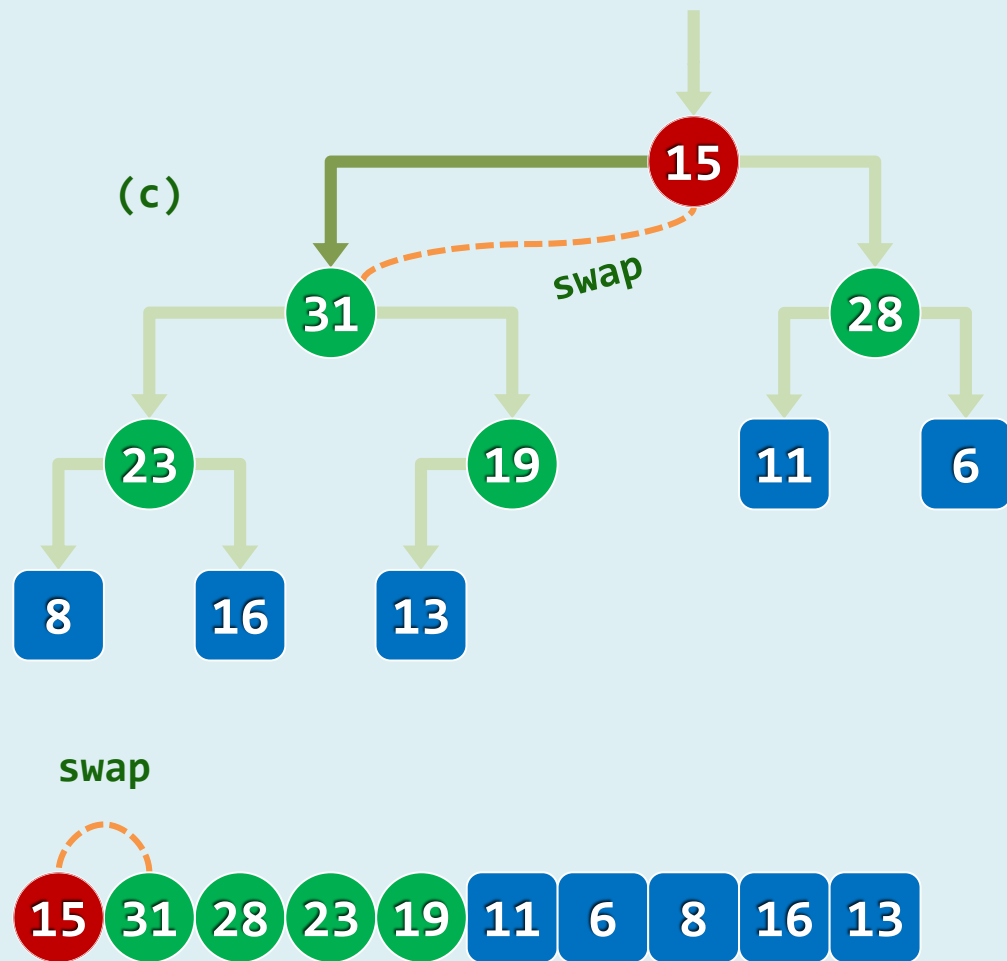
实例 (1/5)



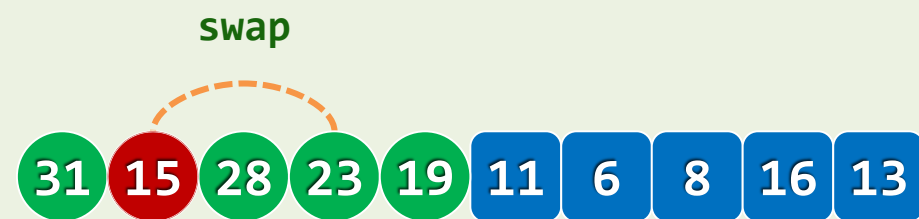
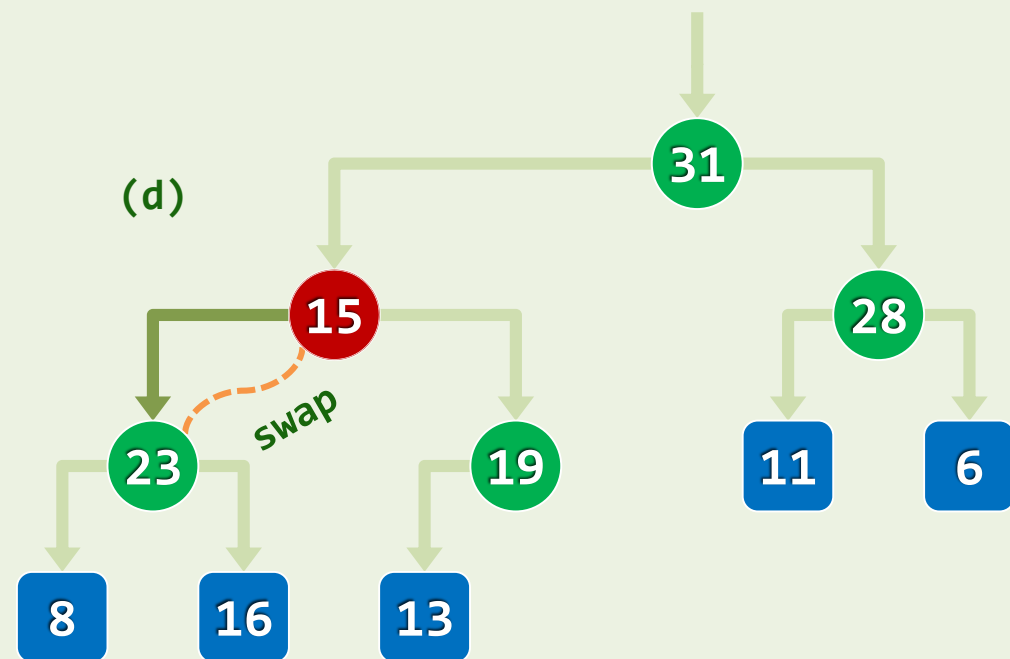
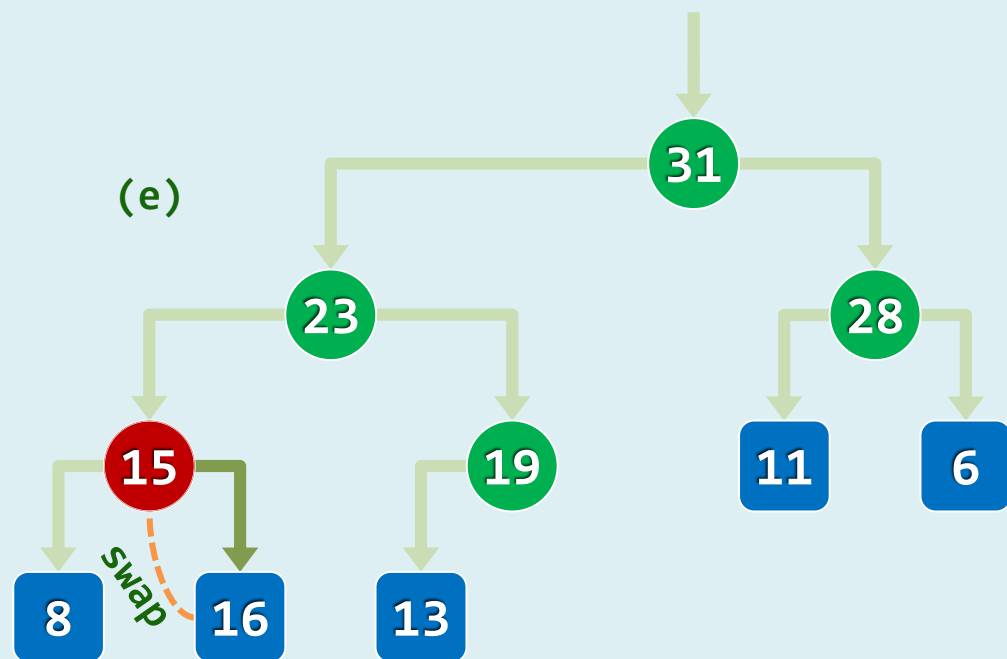
实例 (2/5)



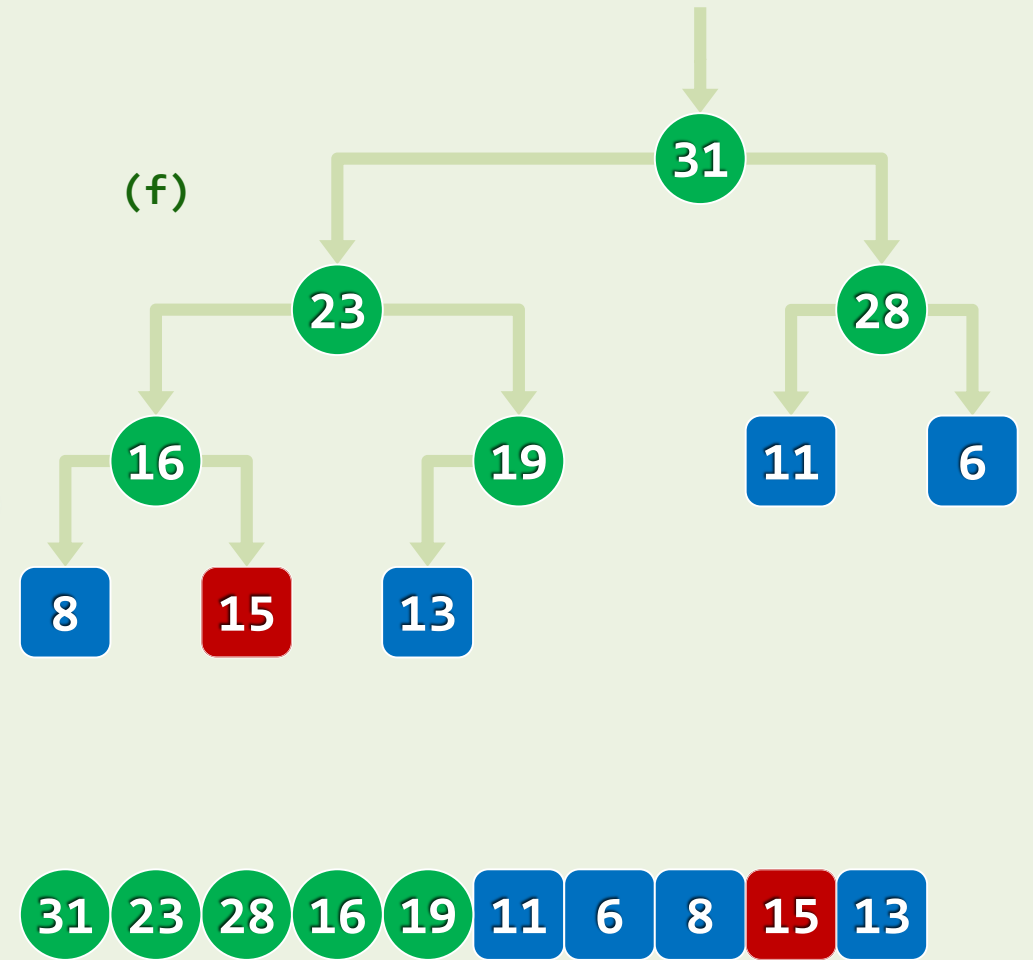
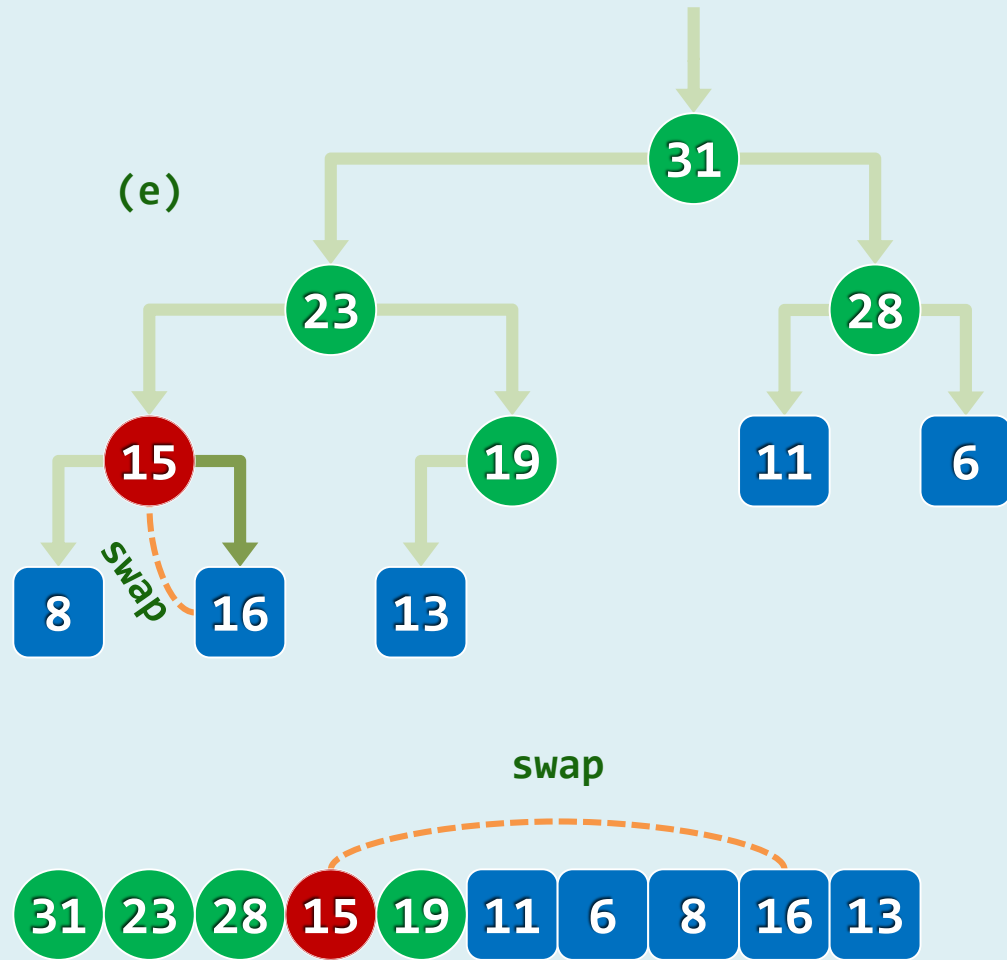
实例 (3/5)



实例 (4/5)



实例 (5/5)



实现

```
❖ template <typename T> T PQ_ComplHeap<T>::delMax() { //取出最大词条
    swap( _elem[0], _elem[ --_size ] ); //堆顶、堆尾互换
    percolateDown( _elem, _size, 0 ); //新堆顶下滤
    return _elem[_size]; //返回原堆顶
}
```

```
❖ template <typename T> Rank percolateDown( T* A, Rank n, Rank i ) { //0 <= i < n
    Rank j; //i及其（至多两个）孩子中，堪为父者
    while ( i != ( j = ProperParent( A, n, i ) ) ) //只要i非j, 则
        swap( A[i], A[j] ), i = j; //换位，并继续考察i
    return i; //返回下滤抵达的位置（亦i亦j）
}
```


效率

❖ e在每一高度至多交换一次

累计交换不超过 $O(\log n)$ 次

❖ 通过下滤，可在 $O(\log n)$ 时间内

- 删除堆顶节点，并
- 整体重新调整为堆

❖ 数学期望呢？

