

# Set 3 Homework, Analysis of Algorithms

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- p 166: 6.5-6
- p 167: 6-1, 6-2
- p 178: 7.2-1, 7.2-5
- p 180: 7.3-1
- p 284: 7.4-2
- p 185: 7-2, 7-4

## Chapter 6

**6.5-6** Do ‘exchange’ in ‘Heap-Increase-Key’ with one assignment.

The original:

```
HeapIncreaseKey(A, i, key) :  
  if key < A[i]  
    error “new key is smaller than current key”  
  A[i] = key  
  while i > 1 and A[Parent(i)] < A[i]  
    exchange A[i] with A[Parent(i)]  
  I = Parent(i)
```

With three assignments:

```
HeapIncreaseKey(A, i, key) :  
  if key < A[i]  
    error “new key is smaller than current key”  
  A[i] = key  
  while i > 1 and A[Parent(i)] < A[i]  
    tmp = A[i]  
    A[i] = A[Parent(i)]  
    A[Parent(i)] = tmp  
    i = Parent(i)
```

With one assignment:

```

HeapIncreaseKey(A, i, key) :
  if key < A[i]
    error “new key is smaller than current key”
  while i > 1 and A[Parent(i)] < key
    A[i] = A[Parent(i)]
    i = Parent(i)
  A[i] = key

```

That was a real fun little puzzle.

**6-1**

**6-2**

## Chapter 7

1.