

COP4530 – Data Structures, Algorithms and Generic Programming

Recitation 9

Date: March 3 & 5, 2009

1. Formulate the recursion relation for the following pseudo-code and analyze its time complexity.

```
function merge_sort(m)
```

```
    var list left, right, result
```

```
    if length(m) ≤ 1
```

```
        return m
```

```
    // This calculation is for 1-based arrays. For  
    0-based, use length(m)/2 - 1.
```

```
    var middle = length(m) / 2
```

```
    for each x in m up to middle
```

```
        add x to left
```

```
    for each x in m after middle
```

```
        add x to right
```

```
    left = merge_sort(left)
```

```
    right = merge_sort(right)
```

```
    result = merge(left, right)
```

```
    return result
```