# EECE.3220: Data Structures

Spring 2017

Lecture 7: Key Questions
February 1, 2017

1. (Review) Describe how to analyze the worst-case execution time of an algorithm.

2. (Review) Explain big O notation.

3. **Example:** Determine the worst-case execution time, T(n), of each function listed below as a function of n, and express that execution time using big O notation (T(n) = O(?)).

a.

```
   int F(int n) {
      int i, res;
1     if (n < 2)
2        return 1;
3     else {
4        res = 1;
5        for (i=0; i<=n; i++)
6           res *= i;
7        return res;
      }
   }
```

b.

```
   unsigned F(unsigned n) {
      unsigned res = 0;

1     for (i=0; i<n+1; i++)

2        for (j=0; j<n+1; j++)

3          res = res + j;

4     return res;
   }
```

4. Describe a general linear search algorithm for finding a value in an array, including an analysis of its worst-case execution time.

5. Describe a general binary search algorithm for finding a value in an array, including an analysis of its worst-case execution time.

6. Describe a general selection sort algorithm for ordering the values of an array, including an analysis of its worst-case execution time.