EECE.3220: Data Structures

Fall 2019

Key Questions
Algorithmic Complexity (Lectures 5 & 6)

QUESTIONS

1. Describe how to analyze the worst-case execution time of an algorithm.
2. Explain big O notation.
3. Describe a general linear search algorithm for finding a value in an array, including an analysis of its worst-case execution time.
4. Describe a general binary search algorithm for finding a value in an array, including an analysis of its worst-case execution time.
5. Describe a general selection sort algorithm for ordering the values of an array, including an analysis of its worst-case execution time.

EXAMPLES

1. 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 = 2; i <= n; i++)

6           res *= i;

7        return res;
      }
   }
```

b.

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

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

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

4          res = res + j;

5     return res;
   }
```