EECE.3220: Data Structures

Spring 2017

Lecture 7: Key Questions
February 1, 2017

1. (Review) Explain the function used to input one or more characters, including whitespace. Describe the example we use to illustrate its operation.

2. Explain the function used to input an entire line. Show the example we use to illustrate its operation. What issues exist when mixing this function with the stream extraction operator? (>>) How can we fix those issues?

3. Describe how to analyze the worst-case execution time of an algorithm.

4. Explain big O notation.

5. **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;
   }
```

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

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

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