CS 430 – Fall 2016 – Third Quiz

Please work on separate paper, and write only the final solution here. This is an individual quiz, and no electronic help is allowed. Everything with an on/off button must be off. Books and notes are allowed.

Please respect the following guidelines for writing pseudocode:

1. C/Java/Python instructions are fine. But do not write object-oriented additions. Do not declare or use any class. Declare only procedures (if necessary) and explain in words what each procedure does, and what is the use of each parameter.

2. One instruction per line

3. Match the brackets with a horizontal line

4. Number your lines

5. Write down if your array is indexed 0…n − 1 or 1…n.

You have 30 minutes. Good luck!

**Problem:**
Present a linear-time algorithm (that is, with running time \( O(n) \)) for the following problem:

**INPUT:** Array A of size \( n \) with entries 1 or 0  

**OUTPUT:** Number \( m \), the length of the longest consecutive subsequence of 1’s in the array A.

For example, if A is 101110011, at the end of the algorithm, \( m \) should be 4. You do not have to prove correctness (but it matters if it is correct). You must argue that your algorithm has running time \( O(n) \), by counting the number of times each instruction is executed.