**CSCI 165 CS2**

**Week One Discussion**

Closely read the following problems. Your task is to come up with a workable solution to each of these. The goal is to spark some conversation around these problems and algorithmic thinking in general. Make a discussion post and describe how you approached each of these problems. If you are struggling with a problem don’t be scared to post that too. The goal is to help each other out. You are required to interact with your classmates by carefully reviewing their post and providing thoughtful commentary. Did you learn something from their approach? Did you find an error in the reasoning? Let’s talk.

Understand that I am **not** asking you to write any actual Java code here; only to problem solve. I am asking you to use **pseudocode** for one problem. I have included a link to the concept.

Variations of these problems may be encountered at a later date, particularly the Caesar Cipher.

1. **Determine the Output:** Suppose N is 15. What numbers would be output by the following pseudocode algorithm?  
     
   0 => Print N.

1 => If N equals 1, stop.

2 => If N is even, divide it by 2.

3 => If N is odd, triple it and add 1.

4 => Go to step 0.

1. **Determine the Output:** Suppose N is 6. What would be output by the algorithm in that case?
2. **Puzzle Problem:** A Caesar cipher is a secret code in which each letter of the alphabet is shifted by N letters to the right, with the letters at the end of the alphabet wrapping around to the beginning. For example, if N is 1, when we shift each letter to the right, the word ***daze*** would be written as ***ebaf.*** Note that the z has wrapped around to the beginning of the alphabet. Describe an algorithm that can be used to create a Caesar encoded message with a shift of 5. I am not asking you to write a working Java program for this. That will come very soon. I am more interested in you expressing your ideas using pseudocode.   
     
   <https://en.wikipedia.org/wiki/Pseudocode>
3. **Puzzle Problem:** Suppose you received the message, “sxccohv duh ixq,” which you know to be a Caesar cipher. Figure out what it says and then describe an algorithm that will always find what the message said regardless of the size of the shift that was used.