Assignment 9
Computer Science 235

Reading. Sections 7.1, 7.2, 7.3, and 7.4

1) Answer each part TRUE or FALSE.
   a) $2n = O(n)$
   b) $n^2 = O(n)$
   c) $n \log^2 n = O(n^2)$
   d) $\sqrt{n} = O(\log n)$
   e) $3^n = 2^{O(n)}$
   f) $2^{2^n} = O(2^{2^n})$

2) Answer each part TRUE or FALSE.
   a) $n = o(2n)$
   b) $2n = o(n^2)$
   c) $3^n = o(2^n)$
   d) $n = o(1)$
   e) $n = o(\log n)$
   f) $1 = o(1/n)$

3) Show that P is closed under union, concatenation, and complement.

4) Show that NP is closed under union and concatenation.

5) Part 3 (of 3). This is the final part of your project exploring research papers that use Theory of Computation in one way or another. Write a 1-2-page reflection paper (double-spaced) on the ways in which the assignment has helped you engage with the content of the course and theoretical Computer Science in general.

Here are some questions to think about as you prepare to write this reflection:

a. What did you learn from talking with your peers about the paper you read?
b. What is a topic that the paper introduced or mentioned and you’d like to know more about?
c. What is one thing you can take away from the experience of engaging with this paper to your life after CS235?
d. What is one piece of advice you would share with a future student reading this paper?
Make sure to address all these questions in your answer. We encourage you to be both reflective and creative. Take this opportunity to actually reflect on your learning this past semester.

Your reflection should be logically organized and easy for a reader to follow. This is not an academic essay, but you are trying to make a point! You need to have a clear idea that you are pushing across, and you need a coherent argument. This is not a draft, so make sure to use clear language with no grammatical errors.

Grading

As a reminder, this project is worth 5% of your final grade. This part of the project is worth 3% of your final grade.