CSE 262: Quiz #1  
Due September 16th, 2022 at 11:59 PM

The quiz has TWO questions. Please submit your answer by updating this file in the quizzes folder of your Bitbucket account, and then committing and pushing. You should use as much space as you want for each answer. Please be detailed in your answers. Remember: this quiz is worth 9% of your grade, and you will not receive very many points if you do not give detailed answers.

**Question 1:** Extend the grammar from Figure 2.25 with an exponent operator (^) that has higher precedence than multiplication and division, and with a modulus operator (%) that has lower precedence than multiplication and division, but higher precedence than addition and subtraction. Accompany your proposed grammar with text explaining what you did and why.

**Question 2:** In your repository’s p1 folder, you will find the files `scanner\_ids\_nums.png` and `scanner\_keywords.png`. When we combine them (by merging the common states), the result is a nondeterministic finite automata. First, you should explain why it is nondeterministic. Then, you should create a new diagram consisting of the composition of the two automata, but with whatever changes would be needed in order to make it deterministic. Be sure to explain what you did, and why. Is your construction *minimal*?