

# CSC 311—Theory of Computation

## DFAs, NFAs, REs and Context-free grammars.

### Tutorial 3

Second Semester 2017

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Assume that  $\Sigma = \{a, b\}$  when it is not otherwise given.

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1. Sipser Exercise 1.29 (b)
2. Sipser Exercise 1.29 (c)
3. Show that  $\{w \in \{a, b, c\}^* \mid w = w^R\}$  is not regular.
4. Show that the set PAREN of balanced strings of parentheses over the alphabet  $\{ (, ) \}$  is not regular. For example  $(( ( ) ) ( ) )$  is in PAREN but  $) ( ( )$  not.
5. Exercise 2.4 (a)–(f) in Sipser.
6. Draw the minimal DFA for the following DFA:

