**Week 2 Tutorial Session**

Tutorial exercises include more problems than what a typical student can solve in 15–20 minutes. Don’t be discouraged if you cannot solve all the problems within the time limit.

1. Draw a state diagram of a DFA (over \{a, b\}) that accepts the following language:
   
   (a) \( \{w \mid w \text{ contains the substring } baa\} \)
   
   (b) \( \{w \mid w \text{ has at least two } a\text{'s or at least two } b\text{'s}\} \)
   
   (c) \( \{w \mid w \text{ contains the same number of occurrences of } ab \text{ and } ba \text{ as substrings}\} \)
      
      For example, \( aba \) is in this language because \( aba \) contains a single \( ab \) and a single \( ba \), but \( abab \) is not in this language because \( abab \) contains two \( ab \) and one \( ba \).

2. (a) We considered the following NFA in the second lecture:

   
   ![NFA Diagram]

   Does the NFA accept \( 01 \)? \( 11 \)? \( 011 \)?

   (b) Consider the following DFA:

   
   ![DFA Diagram]

   What strings stop at \( r_0 \)? At \( r_1 \)? At \( r_2 \)? What is the language of the DFA?