1. (6 pts) Programming languages
   Name a disadvantage of dynamic types in terms of program correctness. Provide a code example in Ruby showing the disadvantage.
   **Type errors are not caught at compile time.**
   For example, in the following code:
   ```ruby
   x = 4
   x = \"a\" if ( ... )
   x = x / 2
   x = \"a\" is not a compile-time error. The error is hidden until x = x/2 is executed at run time.
   ```

2. (4 pts) Ruby features
   What is the output (if any) of the following Ruby programs? Write FAIL if code does not execute.
   a. ```ruby
      a = [ ]  # nil
      a[1] = \"b\"
      a[2] = 3
      a.each{ |x| puts x }
   ```

3. (4 pts) Regular expressions and finite automata
   Give a regular expression equivalent to the following finite automaton.
   ```
   0 | 01 | 011 or 0( c | 1 | 11)
   ```

4. (6 pts) Regular expression to NFA
   Create a NFA for the regular expression a(bc)* using construction method from class.
5. (10 pts) NFA to DFA

Apply the subset construction algorithm to convert the following NFA to a DFA. Be sure to list the NFA states represented by each DFA state.