Assignment 1

(Please work in groups of two or three and submit one answer sheet for the group.)

1. For the following FA, determine which of the strings 0110, 1, 1011010 and 00000 are accepted.

2. Construct an FA that accepts all strings of \{a, b\} that contain either ab or bba (or both) as substrings.

3. Construct an FA that accepts all strings of \{a, b, c\} whose symbols are in alphabetical order. (For example, aaabcc and ac are okay; abca and cb are not.)

4. Which of the following languages can be accepted by a (deterministic) FA that has exactly two states? Justify your answer.
   (a) all binary strings
   (b) all binary strings contains 0
   (c) all binary strings of odd length
   (d) all binary strings starting with a 1

5. For the alphabet \{a, b, c\}, let \(L\) be the language of all nonempty strings \(x\) such that:
   if \(x\) starts with the symbol a, then it ends with the symbol b,
   if \(x\) starts with the symbol b, then it contains no c, and
   if \(x\) starts with the symbol c, then it has even length.
   Give an FA for \(L\).

Due: Thursday September 1