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

2. Construct an RE 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.)

3. 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 RE for \(L\).

4. Describe in simplest terms the language \(((0 + 01)^∗)^∗\)

5. Draw a DFA that accepts all strings that represent decimal numbers (such as 3.1415). Add actions to the transitions so that it calculates the value of the number as it reads the string.

6. Consider the following (nondeterministic) FA.

(a) List one string of length 4 the FA accepts.
(b) List one string of length 4 the FA rejects.
(c) Explain in succinct but precise English what property of binary strings the FA tests for.

Due: Thursday September 8