Exercise 1
Specify an automaton over alphabet \{0, 1\} that accepts exactly those words containing an odd number of 0 and an even number of 1.

1. Graphically specify the automaton which accepts exactly the words described above.
2. Formally specify the automaton as a 5-tuple, including all of its components.

Exercise 2
Draw an FA \(A\) with input-alphabet \(\Sigma := \{a, b\}\) having exactly 2 states such that...

1. \(\ldots A\) is non-deterministic and incomplete.
2. \(\ldots A\) is deterministic and incomplete.
3. \(\ldots A\) is non-deterministic and complete.
4. \(\ldots A\) is deterministic and complete.

Justify each of your solutions.
Exercise 3

Specify an automaton over the alphabet \{a, b, c\} which accepts the words of the language with the following properties:

1. a word ends with at least two \(b\)
2. symbol \(a\) is always followed by an odd number of \(c\)
3. there are no other restrictions on the words

Examples: \(bb, acbb, bacccbbcbacbbb, \ldots\)

1. Graphically specify the automaton which accepts exactly the words described above.
2. Is the automaton deterministic?
3. Is the automaton complete?

Exercise 4

Show the product automaton of \(A_1\) and \(A_2\) shown below.

\(A_1:\)

\(A_2:\)