EXERCISE 1

Give a DFA accepting the following language over the alphabet \{a, b\}: the set of all strings such that the second last symbol is b.

EXERCISE 2

Give a DFA accepting the following language over the alphabet \{x, y\}: the set of strings that either begin or end (or both) with yx.

EXERCISE 3

Give a DFA accepting the following language over the alphabet \{0, 1\}: the set of strings such that the number of 0's is divisible by five and the number of 1's is divisible by three.

EXERCISE 4

Give a DFA accepting the following language over the alphabet \{a, b, c, d\}: the set of strings consisting of zero or more a's followed by zero or more b's, followed by zero or more c's.
1) The DFA looks as follows:

We show that it accepts bbaaba but not abbbbaa
- \((q_0, b) \rightarrow q_2\), \((q_1, b) \rightarrow q_2\), \((q_2, a) \rightarrow q_3\), \((q_3, a) \rightarrow q_0\)
- \((q_0, b) \rightarrow q_1\), \((q_1, a) \rightarrow q_2\)  \(q_2\) is a final state
- \((q_0, a) \rightarrow q_0\), \((q_0, b) \rightarrow q_1\), \((q_1, b) \rightarrow q_2\), \((q_2, b) \rightarrow q_2\)
- \((q_2, a) \rightarrow q_3\), \((q_3, a) \rightarrow q_0\)  \(q_0\) is not a final state

2) The DFA looks as follows:
3) The DFA looks as follows:

![Diagram of DFA 1]

4) The DFA looks as follows:

![Diagram of DFA 2]