INFORMATION AND COMMUNICATIONS TECHNOLOGY ACADEMY

SOLUTION TO EXERCISES

For Exercise 3

Design a DFA that accepts all strings over the alphabet $\Sigma = \{0, 1\}$ that starts or ends with a 01.

This is similar to the design example except that instead of a string starting and ending with the substring 01, the DFA should accept strings starting OR ending with the substring 01.

One way of processing the strings is to determine first if the prefix 01 is present. If it is, then the DFA stops at an accept state, regardless if there are still incoming input strings.

If the string did not start with the prefix 01, then the DFA proceeds to determine if it will end with the suffix 01.

The DFA will have 6 states:

1. q_0 = the first symbol of the prefix 01 had not arrived.
2. q_1 = the first symbol of the prefix 01 had arrived.
3. q_2 = the two symbols of the prefix 01 had arrived.
4. q_3 = the prefix 01 was not encountered.
5. q_4 = the prefix 01 was not encountered and the first symbol of the suffix 01 had arrived.
6. q_5 = the prefix 01 was not encountered and the two symbols of the suffix 01 had arrived