

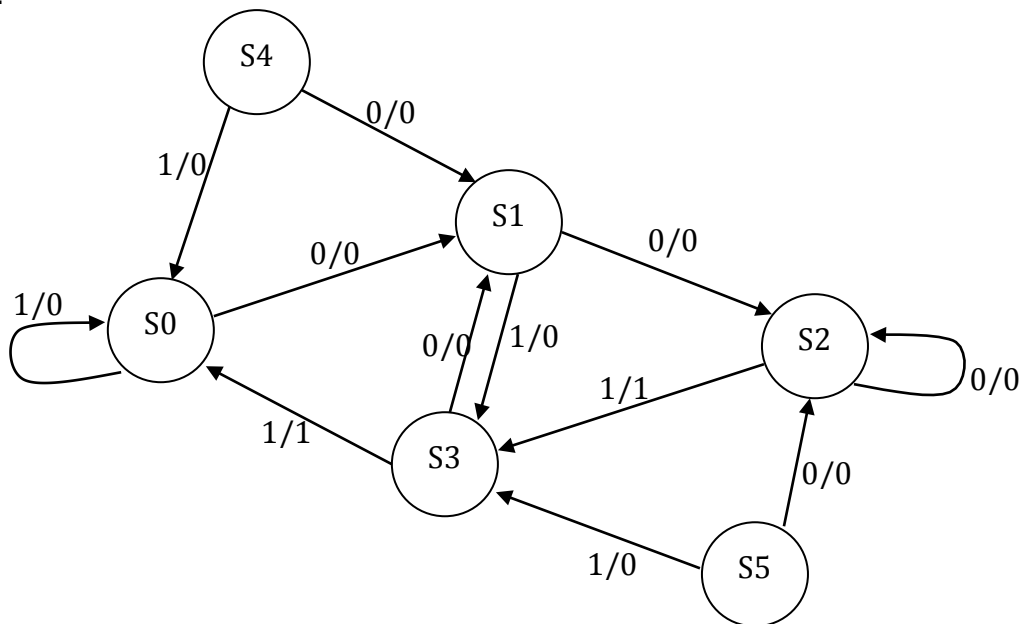
Exercises on the topics of class 17

Exercises with a solution

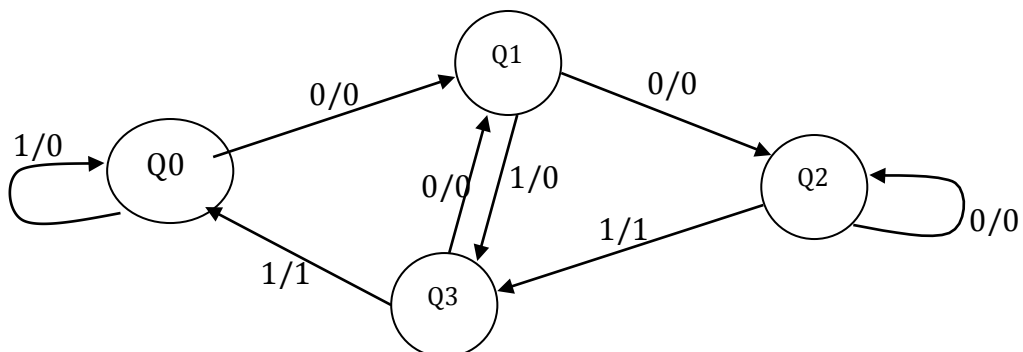
Ex. 1. Draw the Mealy automaton specified by the following table:

	0	1
S0	S1/0	S0/0
S1	S2/0	S3/0
S2	S2/0	S3/1
S3	S1/0	S0/1
S4	S1/0	S0/0
S5	S2/0	S3/0

SOLUTION:



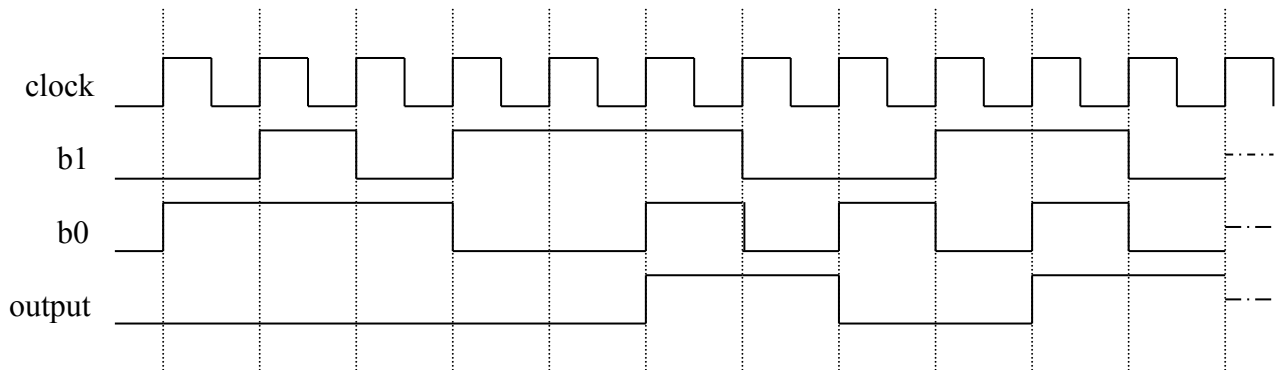
Ex. 2. Consider the following automaton:



Represent on a temporal diagram the output sequence and the traversed states with input sequence 01000110011.

SOLUTION:

The four states of the Mealy automaton can be codified as follows: $Q_0 = 00$, $Q_1 = 01$, $Q_2 = 10$, $Q_3 = 11$. Moreover, let's call the input bits as b_1 and b_0 . The temporal diagram with input 01000110011 is:



Exercises without solution

Ex. 1. Give the automaton that accepts the words SONO and NOSO, with and without superpositions.

EX.: SONNONOSONOSOOSO

OUT: 0000000001 0101 000

Ex. 2. We want to describe the fault checker of a lift. Three kinds of faults are caught: broken door closure, broken pushbutton and irregular speed. In case of one single fault, the automaton has to switch a warning on; from the second fault on (**important:** the two or more faults can happen in different moments of time) the automaton, apart from the warning, has to call the technical support. Once the faults have been fixed by the support, the control unit is reset: the warning is switched off and the fault counting starts again from 0.

Give the desired automaton whose inputs are the faults and the technical support, and whose outputs regulate the warning and the call to the technical support.

Ex. 3. Design an automaton that counts modulo 3 the (non overlapping) occurrences of the binary string 11 in an input sequence. Then, show the output sequence and the traversed states with input 11001111100.