

SECOND MID TERM SIMULATION

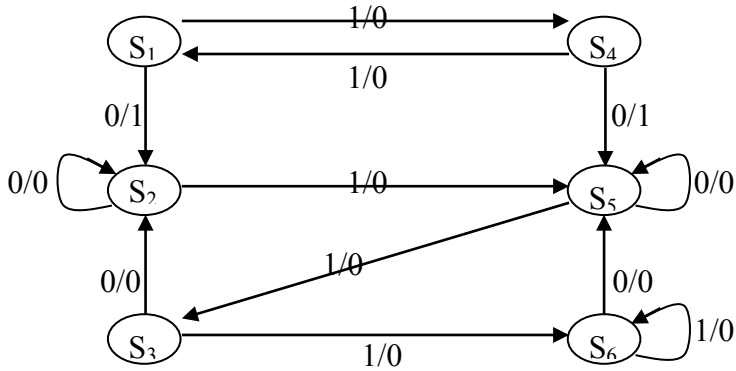
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Exercise 1 (10 points). Let us consider 4 registers R_0, R_1, R_2, R_3 , and design an interconnection net such that:

- Moves the content of R_1 into R_0 , if $R_0 < R_3$, or into R_3 , otherwise;
- Moves into R_1 the content of R_2 , if R_0 is even, or of R_3 , otherwise.

The movements are regulated by a control signal X : when 0, the first transfer happens; when 1, the second one. Furthermore, transfers are enabled only when the content of R_0 is a multiple of 4.

Exercise 2 (8 points) Minimize the following Mealy automaton, with initial state S_1 ; then, give a Moore automaton equivalent to the minimal one:



Exercise 3 (12 points) Design an automaton that receives in input characters A, B, C and D, and give in output 1 when the last 2 symbols received are in non-decreasing alphabetical order. Ignore the first output (in the sense that it can be arbitrarily put at 0 or at 1).

Example input: BACCDABDA...
output: - 0 1 1 1 0 1 1 0...

Design the temporal diagram for the input of the above example.

