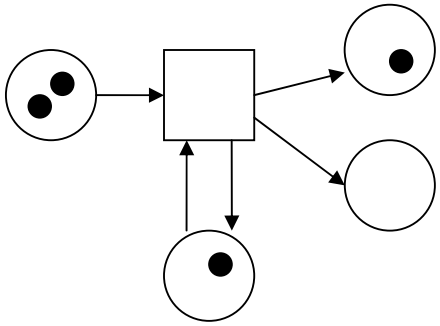
In The Name Of God

Advanced Software Engineering

University of Tehran, ECE Dept. **1384 /2 /26**
Name, Family name:
Student No.:

1- Consider the Petri net of figure below. Assuming the given start state, what are the consecutive states (go ahead for 3 steps)?



2- A student wants to simplify the Petri net of Figure A to the net of Figure B. Is this allowed, i.e., are these two nets equivalent?

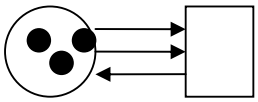


Figure A

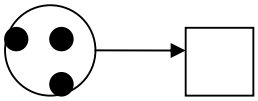


Figure B

3- The life of students in a student house consists of sleeping, eating and studying. We can model the life in a student house using the Petri net of Figure C. Every token in this Petri net represent a student. In the state shown in Figure C three students are eating, four students are studying and no student is sleeping. The transitions **es**, **ss** and **se** represent the three possible state transitions of the student.

a) In the Petri net in Figure C all students can go to sleep at the same time. Consider a student house where only one bed is available. There can thus never be more than one student in the state "sleeping". Adjust the Petri net in Figured C so as to account for this situation.

b) The table in student house only allows four persons to take a seat. There can thus never be more than four persons in state "eating". Adjust the Petri net in Figure C to account for this restriction.

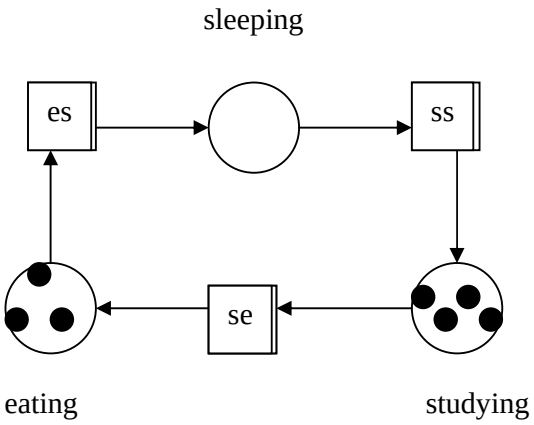
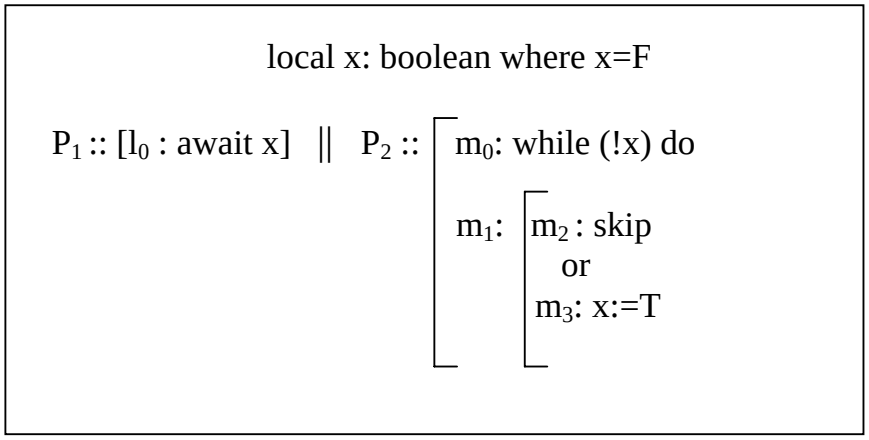
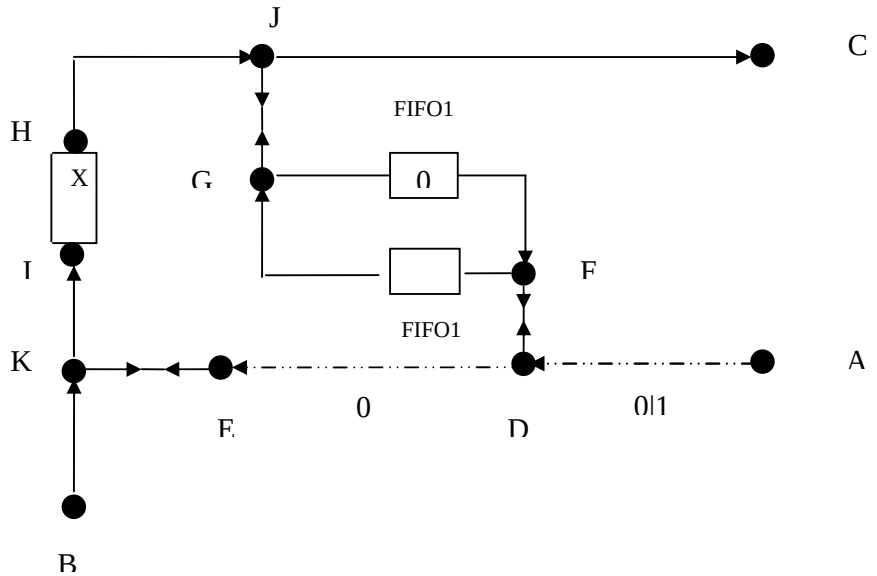


Figure C

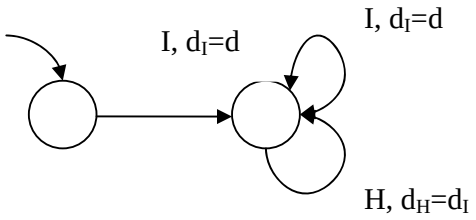
4- Write down all the possible computations of the following program.



5- Draw the constraint automaton of the Reo circuit below. Then do the hiding.



X is a component with the following constraint automaton:



The symbol denotes a filter, which only passes the data written on it, and discards the other data (data of any kind is read from the source end but not passed to the sink node). The symbol 0|1 on the filter means zero or one can be passed, and other types of data are discarded.

6- Draw a Reo circuit which models the coordination and communication between rebecs in Rebeca. Take rebecs as components in the Reo circuit, and use Reo channels (or components with pre-defined behavior) to coordinate them(rebecs) according to Rebeca semantics. Also, the communication between rebecs shall be modeled by Reo circuit.