CSP 740, CSE, IIT Jammu

Software Engineering (Methodologies)
MTech I (1st semester)/BTech III (6th semester)
Lab Assignment No 4 - Petrinet Simulation

SPRING Semester 2019-20

Instructions:

1. *The date of submission:* **will be specified two days before**. *However, for every delayed submission after the deadline, 10 marks per day will be deducted from the maximum marks of the assignment, without any exception, whatsoever may be the scapegoat.*
2. *The viva for this assignment will be taken on a future date as specified.*
3. **Maximum Points 100.**

Download the Petrinet simulation tool viz. WOPED from the URL WOPED-URL and install it in your machine. Use the instruction manual at this site to learn how to use the tool. Design the petrinet for the problems given below and simulate the net you designed using this tool.

1. Petrinet for the Producer-Consumer problem: *Consider a Producer process that produces an item and writes into the shared buffer. A consumer process reads the item from the shared buffer and consumes the same. The capacity of the buffer is three.*

2. Petrinet for two traffic lights at a crossroad: *The behaviour of the two trafffic light units at a crossroad is to be modelled such that while one arm of the roads is green the other is red. The transition from Green to Red occurs through the Yellow. The model should exhibit safety and liveness properties.*

3. Petrinet for the Sleeping Barber problem: *A barbershop consists of a waiting room with n chairs and the barber room containing the barber chair. If there are no customers to be served, the barber goes to sleep. If a customer enters the barbershop and all chairs are occupied, then the customer leaves the shop. If the barber is busy but chairs are available, then the customer sits in one of the free chairs. If the barber is asleep, the customer wakes up the barber.*

4. Petrinet for the Cigarette-Smokers problem: *Consider a system with three smoker processes and one agent process. Each smoker continuously rolls a cigarette and then smokes it. But to roll and smoke a cigarette, the smoker needs three ingredients: tobacco, paper, and matches. One of the smoker processes has paper, another has tobacco, and the third has matches. The agent has an infinite supply of all three materials. The agent places two of the ingredients on the table. The smoker who has the remaining ingredient then makes and smokes a cigarette, signaling the agent on completion. The agent then puts out another two of the three ingredients, and the cycle repeats.*

5. Petrinet for the problem: *A file is to be shared among three different processes, P_1, P_2, P_3. Only one of the three processes must be allowed to write into the file, whereas all the three processes can read from the file. A process must not be allowed to read from the file before other process has written into the file.*

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