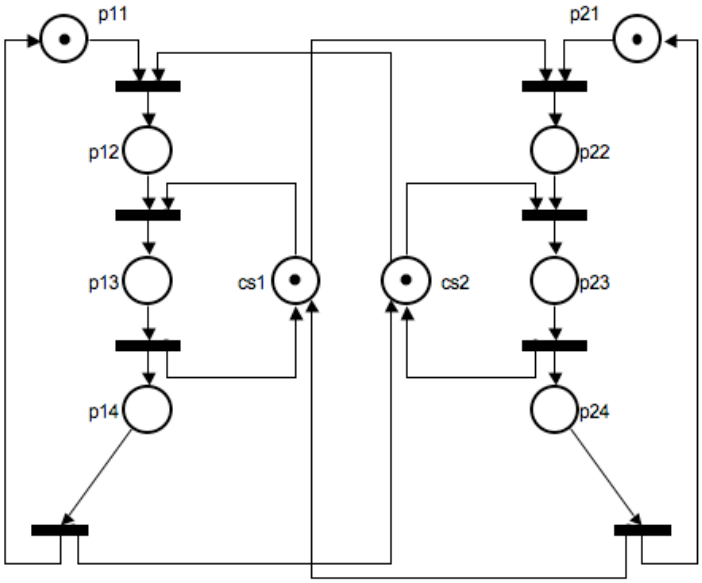
CMPSCI 520
Homework #3
October 5, 2008
Due: October 21, 2008

1) Pick an Agile Process that we did not cover (Adaptive Software Development, Agile Modeling, Dynamic System Development Methodology, Feature Driven Development, or Lean Development) and describe the process in 1-2 paragraphs and illustrate the process.
2) Consider the following Petri Net, which specifies a possible strategy to ensure mutual exclusion.
   a) Beginning with the initial marking shown, describe a reachable marking that represents a deadlock and explain why. You may draw it, or express it in a sequence of markings of the form: (p_{11}, p_{12}, p_{13}, p_{14}, cs_1, cs_2, p_{21}, p_{22}, p_{23}, p_{24}).
   b) Suggest a modification that will prevent deadlocks.



3) Relating Finite State Machines (FSMs) to Petri Nets (PNs):
   a) Sketch a method for converting FSMs to PNs.
   b) Give an example illustrating why it is not always possible to convert PNs to FSMs.
4) Consider the following specification (adapted from Ian Sommerville, Software Engineering, Vol. 7):
   An automated ticket-issuing system sells Amtrak tickets. Users select their destination and input a credit card and a personal identification number. The ticket is issued and their credit card account charged. When the user presses the start button, a menu display of potential destinations is activated, along with a message to the user to select a destination. Once a destination has been selected, users are requested to input their credit card. Its validity is checked and the user is then requested to input a personal identifier. When the credit transaction has been validated, the ticket is issued.
   a) Identify and describe ambiguities or omissions in this statement of requirements,
   b) Provide a set of use cases to describe the behavior of an ATM machine
   c) Write a set of non-functional requirements for the ticket-issuing system, setting out its expected reliability and its response time.