1. I decided to make this homework the last homework of this semester. Therefore, this homework is somewhat larger than the others. In terms of weight, it is twice as much as a regular homework. Since Jan. 1 is a national holiday, the due date of this homework is extended to Jan. 8, which is also the date of our final exam. Please enhance your P6 program to support the following features.

(a) Add a new state called link state. In link state, users of your program should be able to use mouse to add new links to the network (one link at a time, of course). Your program should be able to deny the attempt to connect two places (or two transitions) together. Note: adding links in other states is NOT allowed. [4 points]

(b) Add GUI (e.g. buttons) to support the ability of increasing or decreasing the number of tokens or the limit of a selected place in edit state. Note: these operations are allowed only in edit state. [4 points]

(c) Add GUI (e.g. buttons) to support the addition of new places or transitions to the network. A new place should have no tokens, no limits, and unconnected; a new transition should be unconnected. Adding new places and transitions are allowed in both link and edit states. However, it is not allowed in simulation state. [4 points]

(d) Add a new kind of place called generator. A generator is similar to a regular place in that it can hold a number of tokens and it has a limit. However, in the beginning of every simulation step, a generator automatically increases the number of tokens it holds by one (up to the limit that a generator can hold). Therefore, a dead network may become alive again, when the number of tokens of generators increases. You should use a Template Method to handle this problem; please report how your Template Method looks like in your homework. Note: you may assume that a generator is always added to the network using GUI; you do not need to modify your file format. [4 points]

(e) Draw the class diagram of your implementation. You do not need to draw the class diagram for unit tests. You may simplify the drawing of your class diagram by ignoring unimportant member variables or functions. [4 points]

(f) Bonus: support the ability of deleting a selected place or transition. When a place or transition is deleted, the links associated with this place or transition should also be deleted. [3 points]

(g) Bonus: support the ability of deleting a selected link. [3 points]

(h) Bonus: support the ability of recursive grouping and ungrouping. [3 points]

(i) Bonus: support the ability of copy and paste. [3 points]

(j) Bonus: keep your unit tests running. [3 points]