[SE3BB4] Software Design III: Concurrent System Design

Assignment 1

Due October 18, 2015

Instructions: Please read the questions carefully. Solutions must be submitted in the Avenue Dropbox created for the assignment. Note that the deadline is strictly enforced. The avenue system tracks the exact time that submissions are uploaded and late submissions may be rejected.

Question 1: For the process `ROTATOR` below, provide a list of all of its syntactical errors together with their causes. List entries must have the following format: Line *no* Error *error* Reason *reason*.

```
1 ROTATOR = in_PAUSED.
2 in_PAUSED  = ( Run → in_RUN | Pause → in_PAUSED | Interrupt → STOP ).
3 in_RUN     = ( Pause → in_PAUSED || {Run,Rotate} → in_RUN ).
```

Question 2: From Wikipedia: *Three Men's Morris* is an abstract strategy game played on a three by three board. Each player has three pieces. The winner is the first player to align their three pieces on a line drawn on the board. The board is empty to begin the game, and players take turns placing their pieces on empty intersections. Once all pieces are placed (assuming there is no winner by then), play proceeds with each player moving one of their pieces per turn. A piece may move to any vacant point on the board, not just an adjacent one. Figure 1 shows a possible state of affairs in a Three Men's Morris game.

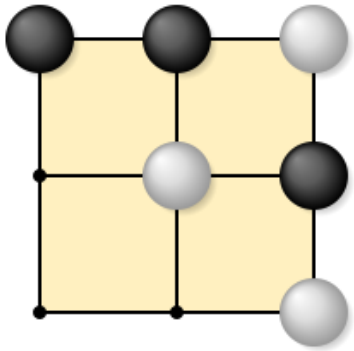

Figure 1: Three Men's Morris.

You are required to model the game and its rules as an FSP process AND to provide a corresponding Java implementation. Hints: You may think of this FSP process as being the parallel composition of separate processes `BOARD`, `PLAYER1`, `PLAYER2`, and `TURN` modelling the behaviour of the board, the players, and the taking of turns in playing, respectively.

References

[1] J. Magee, J. Kramer. *Concurrency: State Models and Java Programs*. 2nd. Ed. John Wiley & Sons (2006).

[2] Wikipedia. *Three Men's Morris*. Link: `https://en.wikipedia.org/wiki/Three_Men's_Morris`.