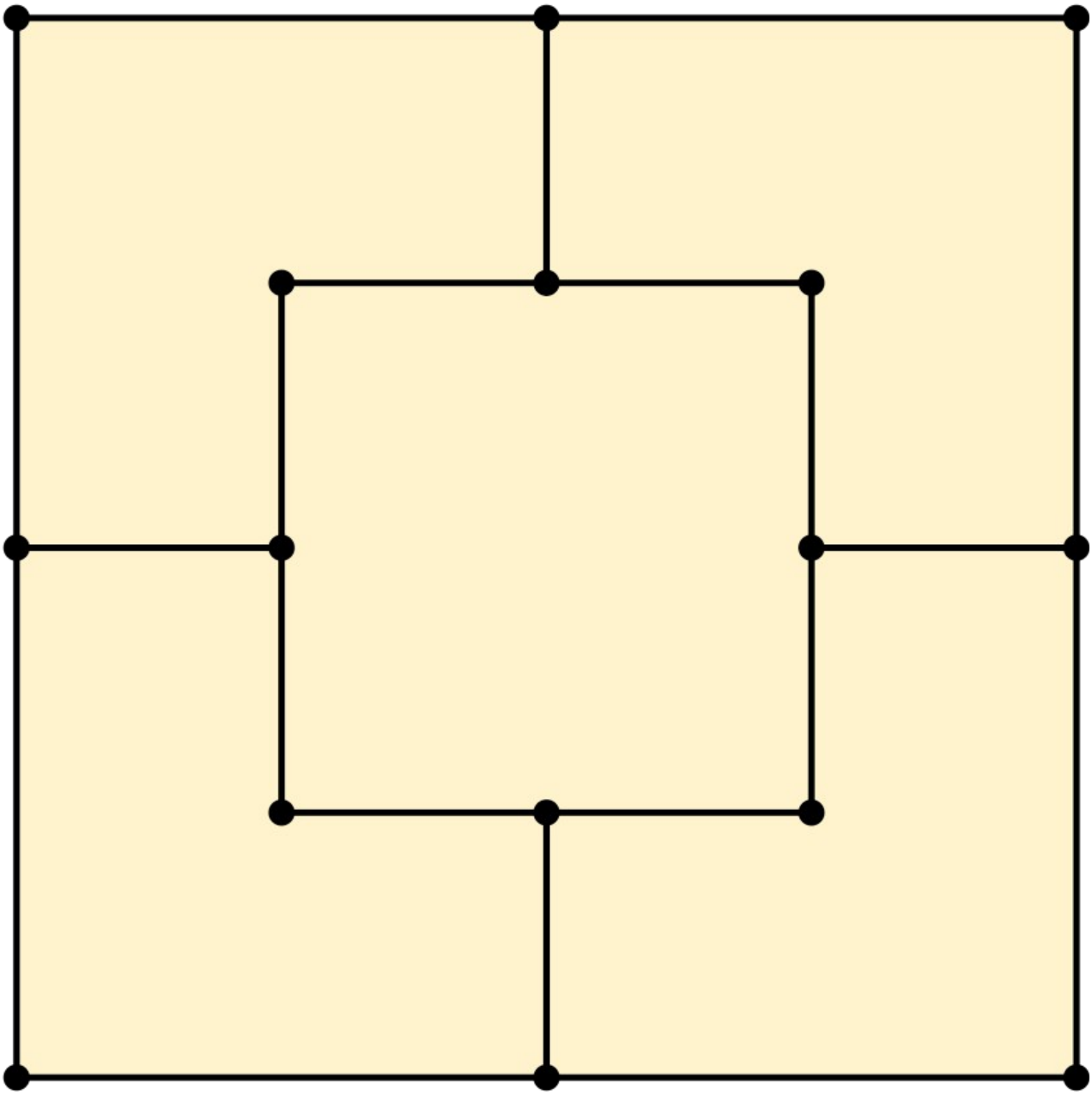
CS 2ME3 and SE 2AA4: Assignment 1 January – April 2016

Due: 22 February, 2015

You are going to implement a game called Six Men's Morris. It is a variant of Nine Men's Morris as described in https://en.wikipedia.org/wiki/Nine_Men's_Morris. Consider the following game layout.



This assignment consists of generating the graphical representation of a Six Men's Morris board, setting up the current state of the game, and being able to make a single "move".

Specifically:

1. Enable the user to set up a board similar to the one shown above. The board should include two different kinds of discs (blue and red), one for each player, initially placed on either side of an empty board. At the start of a game there should be no discs already entered on the board. Note: We will always use blue and red for the colour of the discs.
2. The order of play (blue first or red first) shall be determined randomly.
3. The user shall be able to choose to start a new game, or enter discs to represent the current state of a game by placing different coloured discs in the frame. This latter option shall be achieved by allowing the user to select a colour and then click on the position for that disc. When all the discs the user wants to place have been placed in the frame (the end of this phase being indicated in some way by the user), the system should analyze whether the current state is possible or not (a disc may not be supported by another disc underneath it), and all the errors shall be highlighted in some way on the screen. You need to determine what errors may occur.
4. The deliverables for the assignment include a design document as well as the code and an executable (be clear what system(s) it will run on). The design document should include:

slide 3, p21 4.1. a description of the classes/modules you have decided to use in your application, and your explanation of why you have decomposed the application into those classes;

MIS 4.2. for each class, a description of the interface (public entities), and make sure that there is a description of the semantics (behaviour) of each public method in the class, as well as a description of the syntax;

tutorial 4 slides 4.3. a view of the uses relationship;

4.4. include a trace back to requirements in each class interface;

MID 4.5. for each class, a description of the implementation (private entities), including class variables - include enough detail to show how the class variables are maintained by the methods in the class;

4.6. an internal review/evaluation of your design.

4.7. Document the code so that it is clear how the code follows its design, and also explain design decisions in the code that were not included in the design document.

5. Include a test report document that records how you tested your application (we have not discussed testing yet – so you are on your own with this document ☺).
6. In order to help you with the decomposition, here is some indication of what is to come in assignments 2 and 3:
   6.1. Assignment 2 will require you to be able to make moves. The moves have to be legal moves. In this version of the game users will play both colour discs. The application will have to recognize when the game has been won, or if the game cannot be won. The result of the game must be displayed at all times. Suggested results are: “Blue wins”; “Red wins”, “Game drawn”; and “Game in progress”.
   6.2. Assignment 3 will require you to provide two modes of operation: 2 player Six Men’s Morris, in which 2 people can play against each other; or 1 player against the computer. The latter mode will require you to include an automated mode in which algorithms are used to determine the moves for the computer.

Programming language: Java.

Grading:

The assignment will be graded out of 50.

35 marks for the design document (decomposition – 10, public interface – 8, uses relationship – 4, private implementation – 6, traceability – 4, evaluation of the adequacy of the design – 3).

15 marks for the code (layout, variable names, comments, etc – 5, and “correctness” – 10).