

## Math 576 Final Project (revised)

### due May 1st

Please form a group of two (or one) and do one of the following projects.

1. Two players Left and Right alternate turns placing a piece of their own color to a cell of a rectangular  $n \times m$  game board. Left must not have two pieces of his own color which is vertically adjacent to each other. Right must not have two pieces of his own color which is horizontally adjacent to each other. The first one who can not place his piece on the board is the loser. Find the game values for small configurations (up to a  $2 \times 3$  board).
2. The game board is a sequence of  $n$  empty boxes. Two players Left and Right alternate turns placing a binary digit to form a sequence of a binary string of length  $n$ . Left can only place 0 and Right can only place 1. Both players can place their digits to any empty boxes. The only restriction is that the result number can not be divisible by 3 or 5. Find the game values for small boards of size  $n$  up to 6.
3. Implement the subtractions games using any computer language and any interface at your choices. Here are requirements. Your program allows to set parameters of the subtractions set  $S$  and initial heap sizes. It can play against user.
4. The game of Life is universal. Using Golly to design an initial pattern which can duplicate a glide sequence of any pattern. Two output sequences should run in the same direction.