Math 77D Lab Project 1 (Due May 17)

**Instructions**: Pick one of the following adaptive learning programming assignments. This will be your first program integrating some sort of learning scheme whereby the computer starts by picking moves randomly and ends up able to play perfectly, provided it is in a winning position.

**Novice Programmer (this is your first programming class)**: Write a program which will play computer vs. computer Poison with 5 initial objects. Your program should play the computers against each other 100 times. Initially, each computer should choose moves randomly. If a computer loses, it should punish the last move it made by changing the weights so that it never chooses that move again. If there is a board in which all of the moves have been punished, that player immediately resigns and punishes his prior move. Display a vector which records which player won each of the 100 games.

**Intermediate Programmer (have taken 1 computer programming course prior to this one)**: Write a program which will play computer vs. computer Poison or Cupcake with an arbitrary number of starting objects. Your program should play the computers against each other 1000 times. Initially, each computer should choose moves randomly. If a computer loses, he should punish the last move he made by changing the weights so that he never chooses that move again. If there is a board in which all of the moves have been punished, that player immediately resigns and punishes his prior move. Display a vector which records which player won each of the 1000 games. Also, display each of the possible game states, and what the winning move was for that board.

**Expert Programmer (have taken two or more computer science type courses)**: Write a program which will play computer vs. computer Nim with an arbitrary number of starting piles and objects in each pile. Your program should play the computers against each other until one player wins 100 games in a row. Initially, each computer should choose moves randomly. If a computer loses, he should punish the last move he made by changing the weights so that he never chooses that move again. If there is a board in which all of the moves have been punished, that player immediately resigns and punishes his prior move. Display a vector which records which player won each of the games played. Also, display each of the possible game states, and what the winning move was for that board.