CSC 330 – Artificial Intelligence

**Programming Project #1 – The Game of NIM**

*Due Tuesday, February 4, by the beginning of class*

The first programming assignment for this class is to write a program to play the game of NIM. There are two main reasons for this assignment:

* It may have been a while since you wrote a program, so this assignment will help get you back into the programming “groove.”
* To end up with a program to play NIM, which we will expand upon in later assignments.

For those of you who don’t know how to play the game NIM, here are the basic rules:

* There are two players. Your program should have one human player (the user) and one computer player.
* Between the two players is a pile of sticks (or other objects). For your program, assume that there are 12 sticks – but make the program flexible enough that the number of sticks could be easily changed.
* The players take turns (have your program allow the computer player to start all the time). On each turn, a player may take 1, 2, 3, or 4 sticks from the pile in the middle. Again, you should make your program flexible enough that you could change this rule to allow taking any number of sticks relatively easily.
* The winner of the game is the player that takes the last stick from the pile. In other words, whoever takes the last stick wins.

Your program does not need to have any graphics (although it can if you want to spend the extra time), but for each player’s turn it should be obvious whose turn it is as well as how many sticks are left in the pile.

For this assignment, you may have the computer make any move you like on its turn. The only strategy that will not receive full credit is having the computer pick the same number of sticks every time. Having it pick a random number is fine. You can feel free to make the computer player as good as you want, though. You do need to make sure that the computer can only make legal moves – for example, if there are only 2 sticks left, it should not try to take 3.

We will be revisiting this game later in the course. It will make your lives a lot easier if you make it easy to change the procedure the computer uses to pick its move. I suggest making a function that computes the computer’s move – that way if we change the method of game play, it will not require wholesale rewriting of the code. Also, you should write your code well (easy to read, well-commented, etc.) for the same reason. Remember, you may use any programming language you want, but please let me know if you are using something other than Java or C++.

You should complete this assignment individually – this is not a group assignment. Submit your program assignment via the Moodle course management system. You should be able to submit multiple files for the Moodle assignment, if necessary. Please submit only the source files (not the binary files or the final program). Ask me for help if you have any problems with the process.