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Connect 4 AI Project Write Up

Now what does it mean to learn….For me it means to understand a concept so that you can make an enducated guess without pre knowing the exact answer I picked this project because I wanted to try to legitamatly teach a computer to play connect 4. The game rules are simple enough for us to understand, but how does one convey that to a computer. I built two different ways of doing this. There is(A), logic version of the code which uses some simple “You should do this” instructions, for example, it should make a copy of the board and put the opponents piece in each column, if the opponent has the opportunity to win, the computer should place its own piece there to block it. This is some form of “intelligence” or understanding but a much lower form of it, A bunch of if this do that statements. However I wanted to make something more complex. That is closer to what I consider to be learning. So I built a simple reqard based training model. Basically, there is no if, statements, the only thing the computer is working of off is a reward system. Basically, the computer will play against the logic version of the code hundreds of thousands of times and if it wins, it will be rewarded, and if it loses it will be penalized. This over the course of many games sort of teaches it a basic understanding of the game as we se it. A win is good and a loss is bad. It “Rememebrs” previous board states like a human would and says, I lost like this last time, lets try something different. It can then use similar board states to make educated guesses about where it should put its next piece to obtain a reward. You could also think of this like training a dog. Give it a treat if it does what you want. I have mupltilpe codes including local and online play, training code, model vs model code and playing against the logic version. My program is able to play connect 4 at a certain level, it has a grasp of what the goal of the game is to do and not do do

I would like to try and make more complex models but this will take a lot of time:O, This related to a question we discussed in class like what does it mean to have free will. Does the computer have free will in the logic version? Does it have free will in the model version. There is no if else statements it is closer to looking at a board and making its own judgment based on past experiences, that feels like some low level of intelligence/free will.

You write about the program according to the following guidelines:

Write a well-constructed essay of about 2 to 3 pages (typed, double spaced) which incorporates each of the following:

1. INTRODUCTION: Provide some background for the project. Why did you pick this project? What questions were you hoping to answer? Does it relate to any of the material we discussed in class?
2. PROGRAM: Give an informal, high-level, description of the program. What does it do? What functionality does it have? How does the user use it? Don’t go into any programming details here! If you want, you can include a print-out of the program as an appendix to the paper, but you don’t have to.
3. RESULTS: What is your program able to do (or not do)?
4. DISCUSSION: Did the program satisfy your goals? If not, can you say why? How did the program relate to anything we talked about in class? What improvements/extensions would you like to see?

You hand in your write-up and all of your code (source and executables … a link to a code repository like github will be just fine!) by Friday December 10.

Note: You will have to go to class (in Sage 5711) every Monday and Thursday to discuss your progress.