

# Reinforcement Learning in Connect 4

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## Introduction:

Although an AI is often thought of as being only as intelligent as its programmer, this is not exactly the case; this project will attempt to create an dynamically learning Machine Learner for Connect 4 by using reinforcement learning, as well as to determine what degree of reinforcement allows for the Machine Learner to learn to play the best in the shortest amount of time.

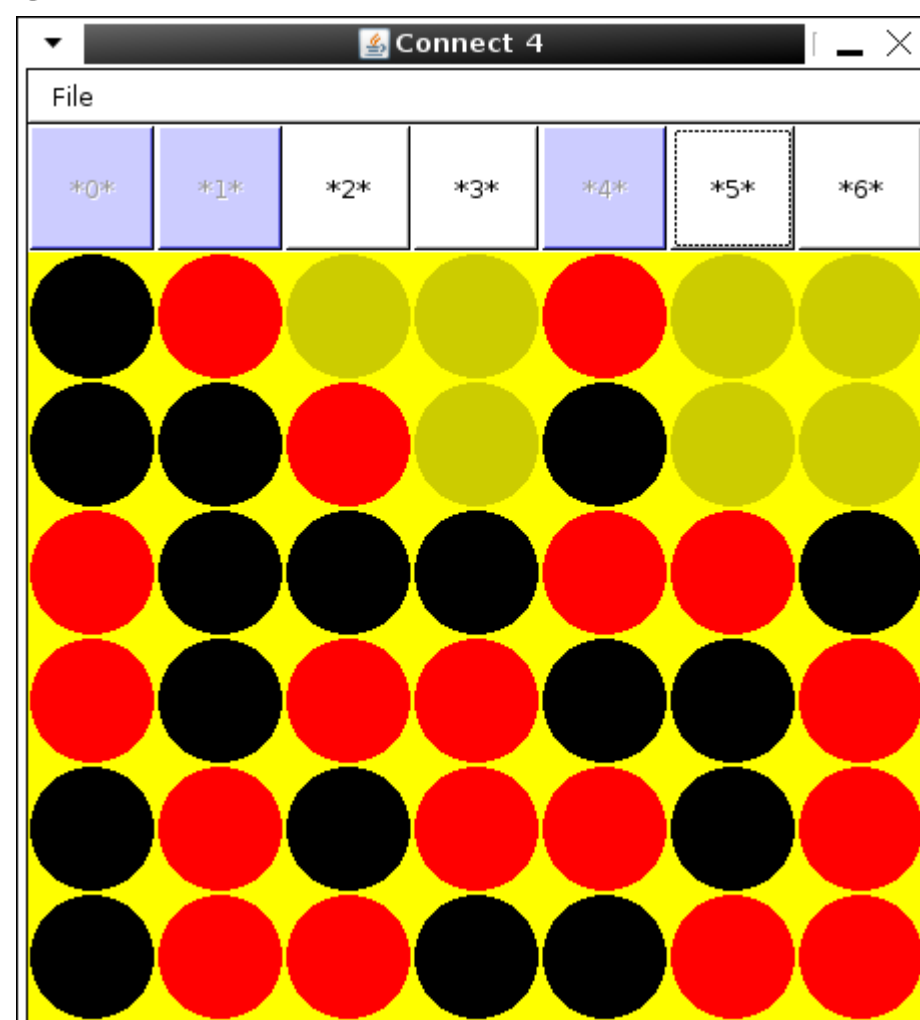
## Background:

I expect to have an ML that thoroughly and hopefully quickly learns to play Connect 4 to an advanced level. Through this project, I hope to learn how fast and to what quality reinforcement learning allows for the learning of a simple game; these methods can hopefully be extended to other, more complex tasks for machines to learn.

Connect 4 has already been solved by James D. Allen and Victor Allis; I will attempt to compare the way the ML plays to the strategies outlined in Allis's *A Knowledge-based Approach of Connect-Four*

## Procedures:

I have currently programmed the connect 4 game itself, as well as created an "ML" (Machine Learner) abstract class that other ML's will be based upon, with methods to load save its board data. I currently have an ML that does not change the way it places pieces, playing completely randomly. I will create ML's that will change the way they play to different degrees - some radically changing their strategies after each game, and others doing so to a more moderate degree.



## Expected Results:

Through this project, I hope to find a degree of reinforcement learning that allows the computer to learn to play connect 4 quickly and thoroughly. I hope that this project may add to the creation process of AI's.