

Week12: CS 6301 - Machine Learning Lab

Date: 06.06.22

Instructions:

1. For exercises and spot u prepare a document with ur code, results obtained, plots and inferences (what do u understand from the results).

2. Write ur own functions (instead of packages) for the algorithms to get full mark.

1. Implement Genetic Algorithm (5)

Implement Genetic algorithm to solve the following card splitting problem?

You have 10 cards numbered 1 to 10

You have to divide them into two piles so that:

The sum of the first pile is as close as possible to 36.

And the product of all in the second pile is as close as possible to 360.

2. Implement Reinforcement Learning (5)

Imagine you were to design a reinforcement learning agent for playing chess. The state that the agent sees on its turn is the layout of the chess board. We can set the reward structure for the agent to be +1 for winning, -1 for losing, 0 for drawing, and 0 again for every move that does not lead to a win or loss. Such an agent will essentially learn to win. It will do so eventually after much exploration and a number of episodes, since it is always trying to maximize its expected return (cumulative rewards in the long run). What might happen if, in addition, we give a positive reward to the agent for taking its opponent's pieces as well?

3. Q Learning (5)

Simulate Q learning for a robot walking around in the following environment (b2 is a wall, entering b4 gives a penalty of -10, entering a4 gives a reward of 10)

