Artificial Intelligence and Machine Learning Fundamentals

Activity 2: Teaching the Agent to Realize Situations When It Defends Against Losses

In this section, we will discuss how to make the computer player play better so that we can reduce the state space and the number of losses. We will force the computer to defend against the player putting their third sign in a row, column, or diagonal line:

1. Create a function called player_can_win that takes all the moves from the board using the all_moves_from_board function and iterates over it using a variable called next_move. On each iteration, it checks whether the game can be won by the sign, and then it returns true or false.
2. Extend the AI's move so that it prefers making safe moves. A move is safe if the opponent cannot win the game in the next step.
3. Test the new application. You will find that the AI has made the correct move.
4. Place this logic in the state space generator and check how well the computer player is doing by generating all possible games.

We not only got rid of almost two thirds of the possible games again, but most of the time, the AI player either wins or settles for a draw. Despite our efforts to make the AI better, it can still lose in 962 ways. We will eliminate all of these losses in the next activity.