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7-3 Project Two

CS-370

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**Structure Defense**

Humans will take many steps to solve a maze by using trial and error. Humans will attempt to solve the problem by observing the maze, theorizing possible outputs, processing those outputs, then executing the chosen output. The human in this scenario will then find the right path and solve the maze without too many mistakes.

Intelligent agents take a different approach to solving the solution. They would start by using random paths to discover the solution. They do not know the correct path so they use multiple random trials to attempt to find the correct path. The agent will use the following steps to find the correct path; Step one will start with the agent will receive input data from any point they will use including the starting point and target point. Step two involves the agent running through the problem again and again until it finds the algorithm for the most optimal path to solve the problem. For the final step, step three, the agent will execute the shortest optimal path to solve the problem.

When comparing and contrasting the solutions, we can start by seeing that both take a similar approach by observing inputs and proving a correct solution via the output. The human uses their eyes to analyze the problem and the agent uses arrays of numbers to analyze the inputs. The first difference we can see is with the time needed to solve the problem. The Human does not always think of maximizing the rewards or any sort of penalties within the scenario. Humans are likely to repeat the same path or wander off a path within the maze by getting distracted or not paying attention. The agent on the other hand will always think of maximal rewards and penalties at every step of the way. The agent will also take every step to continually improving along the way. These factors will all come into play and allow the agent to learn faster and provide a solution faster than the Human.

When looking at comparing exploitation and exploration, we start by searching all the sample inputs and testing all possible combinations of solutions. Exploration involves searching solutions by searching, testing, finding, and perfecting solution combinations. Ideally, the proportion of exploration and exploitation for a pathfinding problem is that the agent will almost always learn through different paths of exploitation. The agent can usually explore and discover new paths of exploration for the following pathfinding problem.

Reinforcement learning helps to use trial and error to determine the correct path. This differs from the agent as the agent uses a testing method to solve the same pathfinding problem.

The implementation of deep Q-learning while using a neural network for the treasure hunting game can be explained by the steps to follow. The first step is by importing the libraries. The second step is to create training environments. The third step is to create a reward system. The fourth step is to create learning agents. The fifth step is to use enhanced learning algorithms. The sixth step is to test agents within the environment. By following the steps detailed above, we are able to implement deep Q-learning when using a neural network to find the best possible sequence that successfully navigates with great outcomes in reaching the treasure cell and also increasing the reward.

Reference Page

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