* **Analyze the differences between human and machine approaches to solving problems.**
  + There are various things to consider when a human is trying to solve a maze, this having to do with sensory and memory skills. The human would have to understand and remember the best route to go to solve the maze and get to the treasure in the least amount of time. The sensory aspect would be the visual indications that the human sees, giving a reward or memory that the human can utilize to help it sole the mazer and get to the treasure. The agent will use their new information and prior memory information to help it navigate the various states from the initial state to the “terminal” state of finding the treasure.
  + Describe the steps your intelligent agent is taking to solve this pathfinding problem.

Th intelligent agent has a much more complex way of solving the problem and getting through the pathfinding to the treasure. You are achieving this by creating a q-training algorithm (neural network) or various rewards throughout the states that gives you the most efficient path to the treasure(reward). This is achieved by implementing deep-Q learning, which gets a value from a state, where the pirate is, and assessing a value(reward) which gives a specific action that the pirate can take. This helps the pirate over an extended period, as it learns the values and essentially solves the path finding problem by maximizing the reward, in this case the least number of steps it takes to get to the treasure.

* + What are the similarities and differences between these two approaches?

Overall, they are both similar in essence but completely different in terms of maximizing the reward. They both are similar in that the agent or person act in a similar way, they use their own information or skills to navigate to the treasure. The human aspect varies in that it can not implement or use the proficiency of the agent in terms of assessing the rewards and figuring out which is best. This is achieved through the agent as it can assess the various states quicker then the human, as well as assessing the reward much more efficiently than the human, essentially finding the best possible path to the treasure.

* **Assess the purpose of the intelligent agent in pathfinding.**
  + What is the difference between exploitation and exploration? What is the ideal proportion of exploitation and exploration for this pathfinding problem? Explain your reasoning.

One of the most fundamental differences with exploitation and exploration could be understood in simple terms. Exploitation wants to make the best decision with the current given information, while exploration wants to gather more information to figure out how to solve the problem. With exploration, we are taking the risk to collect information, in this case with the algorithm, to increase the reward we get at the end. While with exploitation, we use the information we have on hand to strategize to get the best reward. The ideal scenario would be the to utilize exploration to a certain extent, while using a limited amount of data to use exploitation to find the best reward for the algorithm. We can think of this in terms of random exploration, trying to find the best reward by limiting the exploration we do and coming across the preferred reward by happenstance.

* + How can reinforcement learning help to determine the path to the goal (the treasure) by the agent (the pirate)?

Reinforcement learning could be used in a variety of ways to help the pirate get to the treasure at the end of the maze. It helps the pirate make a sequence of decision that will lead it to the treasure. The reinforcement learning algorithm employs a sort of trial-and-error situation, where the agent will either get awarded for a certain path or penalized. The algorithm then must figure out the best the best path to take for the maximum reward through these multiple trials, eventually using efficient and maximized efficiency to take the pirate to the treasure

* **Evaluate the use of algorithms to solve complex problems.**
  + How did you implement deep Q-learning using neural networks for this game?

We can implement deep-q learning in this situation by using our neural network for each state of the maze. With creating the neural network of inputs at each state and the rewards at the end, we can implement the deep-q learning. We can use the DQN to give the pirate in this case, the best possible solution at each state or obstacle, that will maximize his reward to get to the treasure.