**Briefly describe the artifact. What is it? When was it created?**

This assignment was worked on during the *CS 370: Current/Emerging Trends* class. Here we learned about and worked on a reinforcement learning application. The Q-learning algorithm was used to train the agent to move throughout a maze in search of a particular tile acting as the treasure. The agent in this case is called the pirate. The purpose is to train the pirate to find the treasure with efficiency and consistency valued.

**Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in software development? How was the artifact improved?**

This project involves using an algorithm like Q-learning for problem solving. To build upon the project we implement dynamically moving obstacle tiles to the previously stagnant maze environment. The purpose of these moving obstacles is to further challenge the pirate agent in its efforts of finding the treasure tile. Previously, the model needed to navigate the maze with predetermined tiles for obstacles and for tiles the agent is able to move within. Adding movement to the obstacles forces the agent to adapt to a changing environment to discover the treasure.

**Did you meet the course outcomes you planned to meet with this enhancement in Module One?**

Through the introduction of the moving obstacles adaptive algorithm design is applied and achieved along with problem-solving to help the agent move within the more complicated environment.

**Do you have any updates to your outcome-coverage plans?**

No updates are required to the plan at this point but further revisions to the project are still required. I am having issues getting the program to run through each of the testing phases without crashing from seemingly performance related reasons after the cell containing the code  
model = build\_model(maze)

qtrain(model, maze, epochs=3, max\_memory=2\*maze.size, data\_size=16). I am currently altering the values previously listed to make the process more time effective while maintaining effective training.

**Reflect on the process of enhancing and modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?**

To begin, I learned through the process of recreating the environment the project was initially established in given it was completed in a virtual Linux based environment via Apporto (if I recall correctly, I no longer have access to this class on Brightspace). I had to install various libraries such as Keras to my Windows system to successfully run the code. Beyond that, I was fortunately able to find the necessary .py files that were given to begin the project in CS 370. These files were not to be altered but were required imports for the notebook files functionality.

The primary challenges included debugging issues with memory and state representation, ensuring the model could adapt to dynamic obstacles, and resolving compatibility warnings in the machine learning libraries.