Spike: Soldier On Patrol
Title: Soldier On Patrol

Author: Tran Duc Anh Dang | 103995439

Goals / deliverables:

Create a “soldier on patrol” simulation where an agent has two or more high-level FSM modes of behaviour and low- level FSM behaviour. The model must show (minimum)

(a) Highlevel"patrol"and"attack"modes

2. (b) The"patrol"mode must use a FSM to controllow-level states so that the agent wil lvisit (seek/arrive?)

   a number of patrol-path way points.

3. (c) The "attack" mode must use a FSM to control low-level fighting states. (Think “shooting”, “reloading” – the

   actual states and transition rules are up to you.)

Technologies, Tools, and Resources used:

List of information needed by someone trying to reproduce this work

- Python 3+
- Built in Python libraries.
- IDE or Code Editor (Visual Studio Code)

Tasks undertaken:

- Install Python: Download and Install Python 3+ via https://www.python.org/downloads/
- Set up a code editor or IDE: Download and install a python compatible ide or code editor such as Visual Studio Code, PyCharm
- Open and familiarize with the code by reading through, paying attention to the comments that had been made.
- Run the code: Execute the code and observing the output.

What we found out:

Classes and Components:

1. World: The World class defines the environment within which the agents and enemies interact. It manages the updating, rendering, and wrapping around of agents and enemies. Additionally, it provides transformation methods for converting points between local and world spaces.

2. Agent: The Agent class represents an autonomous character within the world. It is responsible for updating and rendering its state, as well as managing its movement, weapon selection, and interaction with other agents and enemies. The Agent's behaviors include patrol, attack, and hide modes, which adapt based on the presence of alive enemies in the world.
3. Enemy: The Enemy class is not explicitly defined in the given code, but it is mentioned within the Agent class. It is assumed that the Enemy class is similar to the Agent class, but with different behaviors and goals.
4. Weapon: The Weapon class manages the properties and functionality of various weapons, such as damage, projectile speed, accuracy, and fire rate. Each weapon is associated with a specific color for visual identification.

Agent Behaviors:

1. Patrol: In patrol mode, the agent follows a predefined path in the world. The agent smoothly moves from one waypoint to the next using the "arrive" steering behavior.
2. Attack: In attack mode, the agent targets the closest alive enemy and moves towards it while maintaining a certain shooting distance. The agent shoots at the enemy using its currently selected weapon. It also avoids moving too close to other agents using the "separate" behavior.