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Py-World Project Proposal

In the early 2000's, Dr. Donald Nute of UGA developed V-World, an environment simulator implemented in the Prolog programming language for the purpose of examining the actions of artificial agents placed into a virtual world. These environments are temporally and spatially discrete with the world's foundational block cells, actors, and environment all displayed on the screen like a video game. Actors in the environment take turns performing actions. An artificial agent has two attributes: strength and damage. If the agent's strength drops below zero or its damage rises above 100, the agent dies. In regard to the agent perceiving the world around it, an agent can perceive the 5 x 5 grid of cells surrounding it without hinderance and may be able to perceive properties of surrounding objects. Some objects of the world are animate while others are not. Examples of animate objects include dragons, hornets, and snails while examples of inanimate objects include first-aid-stations and fruit. Some animate objects will harm the agent while others a just a nuisance. Some inanimate objects will affect the agent's strength and damage attributes. While an agent is theoretically capable of epic feats such as slaying a dragon with a flower and saving a princess who is under the spell of a witch, the sample agent, Bumble, spends his time wandering around eating and collecting things and running away from other animate objects.

For my project, I would like to implement a similar environment simulator, Py-World, and various artificial agents, but with the Python programming language. Using the Pygame library, I have already developed a simple, 2-dimensional, tile-based world with sprite

agents that randomly wander around to test the feasibility of this. Certainly, the difficulty will be in modelling the world, modelling agents and their goals, and implementing interactions between agent, objects, environment, and other actors. The agent will receive perceptions based on their vicinity and use current and past perceptions to make decisions. The agent will have at least two attributes: health and stamina and they will have an inventory of acquired items. The agent will take damage from the environment as well as other actors and their stamina will decrease as they move and perform actions. If either health or stamina drops below zero, the agent will die and the simulation will be over. The agent will, however, be able to regain health and stamina by using found first aid kits and eating found food, respectively. I have two goal-based agents that I would like to implement through personas. A rogue, whose goal is to search for and collect treasure while avoiding conflict and a warrior whose goal is to search for and eradicate orcs.