Defaults

The starting place and initial location of the agents, their type of movement and the repetition of their behavior (behavior period) are as follows:

- Planter agent:
    - At first, 3 plants and randomly except for the storage area (warehouse)
    - A plant with a random location is added every 5 seconds.
    - PlanterBehavior Period=5000

Seeker agent:

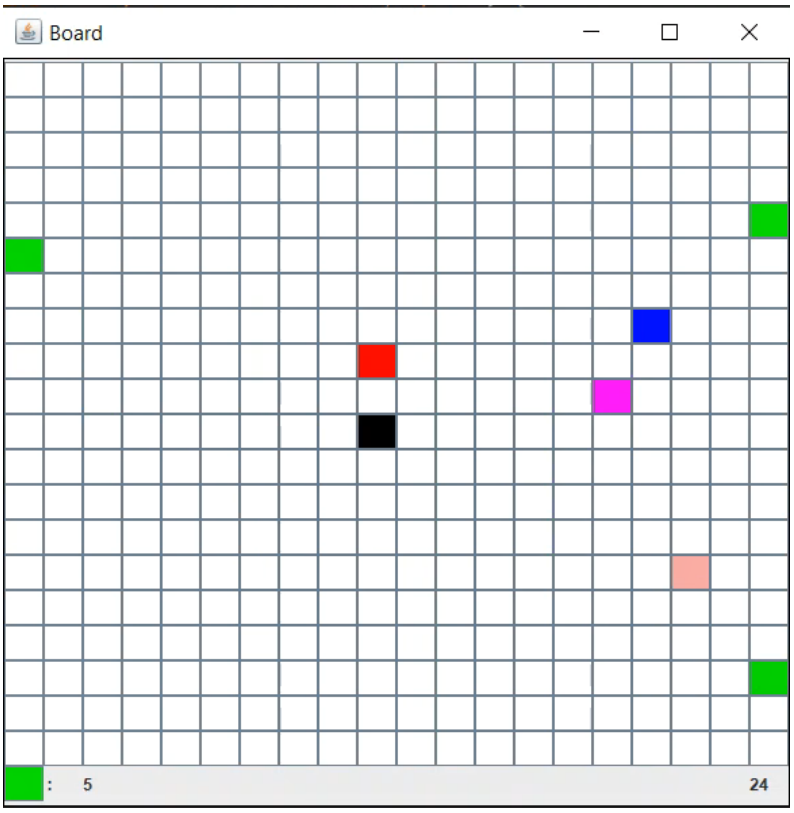
    - Location (0, 10) means the upper left corner that is in the array (0, 0)
    - Moving vertically from the beginning to the end of the entire environment and vice versa
    - SeekerBehavior Period=100
- Collector agent
    - First Collector: location (20 and 6), i.e. the right side and the beginning of the last third in the array (14 and 19).
    - Second Collector: location (20 and 13), i.e. the right side and the beginning of the second third which is in the array (7 and 19)
    - Third Collector: location (20, 20), that is, the upper right corner, which is in the array (0, 19)
    - The movement of these agents is vertically and from the beginning of the location within their limits to the end of the environment and vice versa
    - In case of arriving to a plant, the direct route to the warehouse is chosen.
    - If the location of the plant is announced, the direct route to the warehouse is chosen by the seeker agent.
    - CollectorBehavior Period=100
- Area agent
    - Using the array to control the environment
    - AreaBehavior Period=100

Therefore, agents are moved every 0.1 seconds and the plant grows every 5 seconds and the environment is updated every 0.1 seconds. These ratios are taken into account for the optimization of the simulation.

Environment and Agents

We used Swing library to simulate the environment. This environment includes 20 x 20 squares. The warehouse is black and fixed in 10x10 location. Plants are green and fixed until the collector agent collects them. If an agent reaches a plant and is not able to collect it, when passing over the location of the plant, that square will turn gray. The seeker agent vertically traverses the entire environment and it is shown by blue color. Since there are three collector agents and we want the user can understand the difference in the location of each agent, the agent that covers the first third of the environment is red, the agent that covers the second third is purple, and the agent that covers the last third is pink. At the end of the left

circle, the green square indicates the plant and the number in front of it indicates the number of plants stored in the warehouse.



We also have a second method for specifying the simulation logs. The considered environment array, which does not give any priority to agents and only holds the value of each agent and its location, prints the output every 0.1 seconds along with the number of stored plants. In this output, the amount of planter agents is 4, the first collector is 31, the second collector is 32, the third collector is 33, the seeker is 2, and the warehouse is 1. When an agent reaches a plant and is unable to collect it, that location becomes plus 4. For example, the second agent, which is 32, is delivering a plant to the warehouse, and when it reaches another plant, that location becomes 324, and when it passes, it returns to the value of 4, just to show the user that this agent saw the plant and its location is saved for returning and collection.

This simulation ends after 60 seconds. At first, to finish the simulation, it was used to calculate the start time of Java itself plus 60 seconds, but I noticed that the simulation itself starts 7 seconds later. Therefore, the total simulation time is 60 seconds and the total code execution time is 67 seconds.

There is a timer at the bottom of the screen on the right.