

For this assignment, I used matplotlib library to draw the grid. Through matplotlib, I've used mpmg to import my own sprite which I have made through Piskel. I have also used plt to plot the grid with 1/Black cells for dirty and 0/White cells for clean areas. First I used r, c to set the location of where the sprite will start. Then I used mpmg to import the sprite file I made. Then I created a function called in_bound_cells which I made for the cells in the grid rr and cc and more than or equal to 0 to ensure that the cells stay within the grid. Then I created another function called neighbors to define the cells surrounding the main cell. The function called dirty is used to check to see if there are dirty blocks remaining, if not then it will return. I used the find_nearest_dirty function to look for dirty blocks surrounding the main cell and target it.

In this project I ran into an issue with the sprite, if there are clean cells adjacent to the sprite, the sprite will prematurely end its action. However, I added a loop where the sprite will be prompted to look for dirty cells in the grid. And if there are no dirty dirty cells adjacent, then the sprite will move forward to the direction of the dirty cell.

In a vacuum cleaner simulation, the PEAS framework can be described as:

- Performance Measure
 - How much area has been cleaned
 - The time it takes to clean
 - The amount of dirty cells that has been cleaned
- Environment
 - The dirty/clean cells within the grid representing a room with clean/dirty areas.
 - Dirty cells might be far apart, hence, require good navigation

- Actuator
 - Move forward/ towards dirty cells
 - Stop the vacuum
 - Start the vacuum
- Sensors
 - Dirt sensor
 - Position of Vacuum
 - Obstacle sensor

In this simulation, the vacuum acts as a rational agent because it can perceive its current location, detect whether dirt is present, and take actions like moving up, down, left, or right, and then cleaning the dirt. By perceiving its surroundings and cleaning the tiles, the agent shows a rational behavior.