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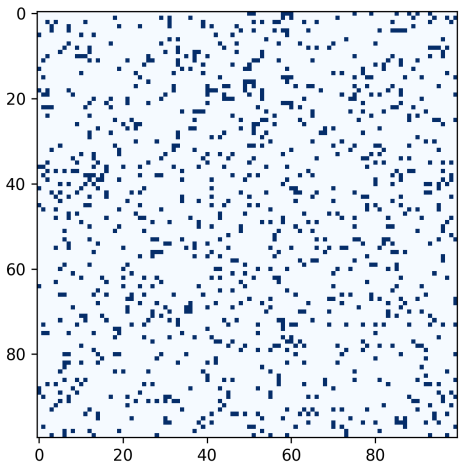
AI Vacuum Simulation Report

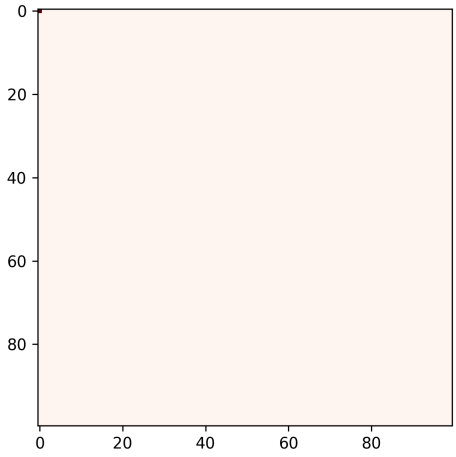
The simulation our group conducted involved the use of a few different types of AI vacuum cleaners. These AI vacuum cleaners differed in the type of agent that they were. The three different types were randomized agent, reflex agent, and model based reflex agent. These agents recorded different results in the 100 simulations we ran for each of them and the results of our findings indicated that some agents worked better than others. The different findings we gathered through the simulations will be shown in this report to get a better understanding of the effectiveness of each individual agent as well as the difference a change in environment makes for each agent.

Agent	Grid Size	Operations Limit #	# Dirty Remaining
Random Agent	5X5	20000	2.96
Reflex Agent	5X5	20000	0.0
Model Reflex Agent	5X5	20000	0.0
Random Agent	10X10	20000	9.96
Reflex Agent	10X10	20000	0.0
Model Reflex Agent	10X10	20000	0.0
Random Agent	100X100	20000	999.97
Reflex Agent	100X100	20000	607.74
Model Reflex Agent	100X100	20000	0.0

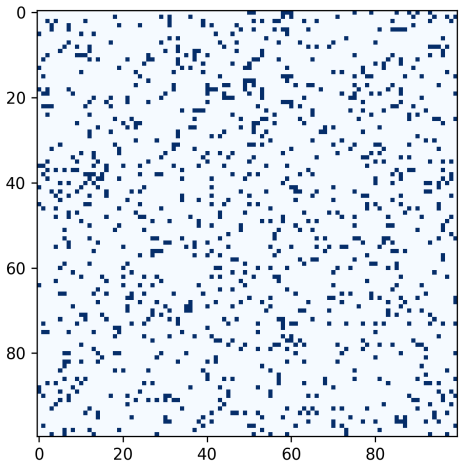
Pictured above are the averages we received through testing each agent with 20,000 moves in a dimension specified environment. The last column from the left indicates how much dirt was still left after each agent was given 20,000 moves to clean its environment. One big takeaway is how effective the model based reflex agent is in a 100x100 environment in comparison to the random agent and reflex agent. Another thing to note is that the model based reflex agent did not have a single simulation where it had dirt remaining in its environment.

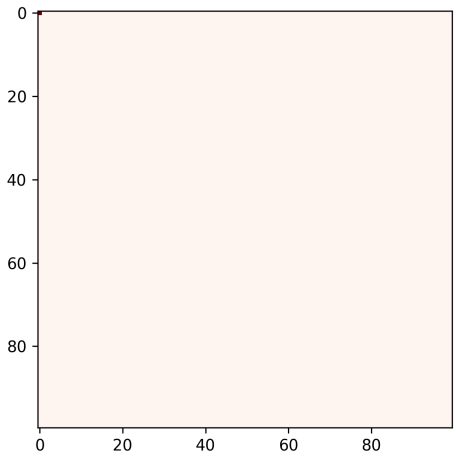
Random Agent: Before Floor and Agent Path





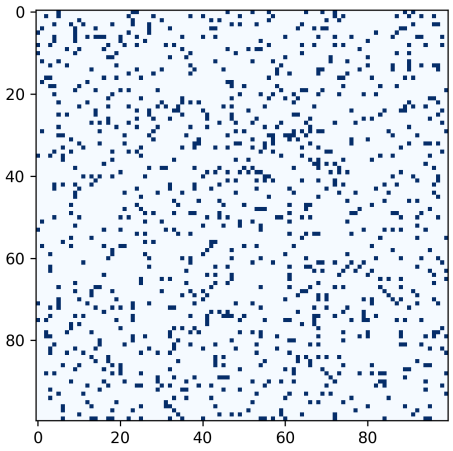
Random Agent: After Floor and Agent Path*

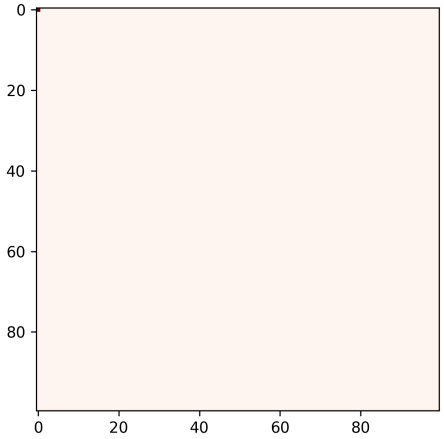




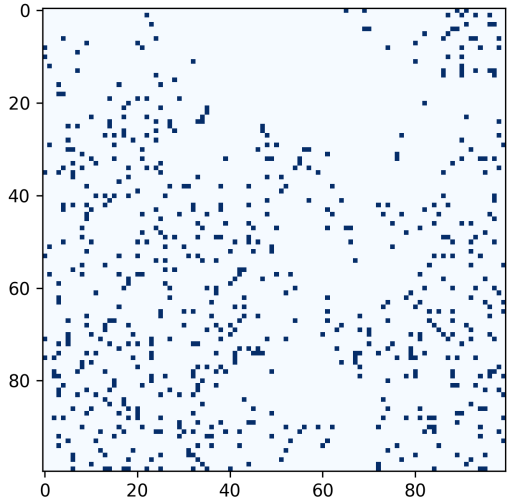
***These pictures have no change because our random agent would always leave the boundary before it cleaned anything.**

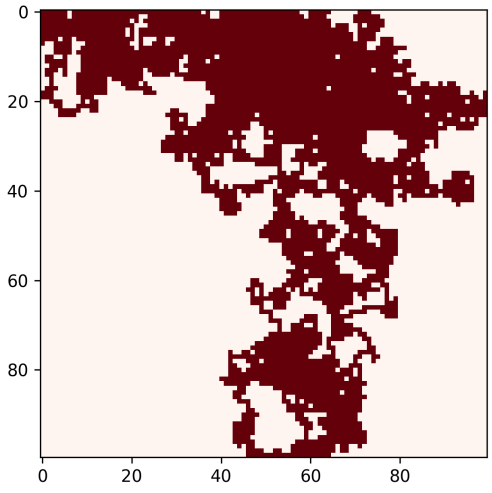
Reflex Agent: Before Floor and Agent Path





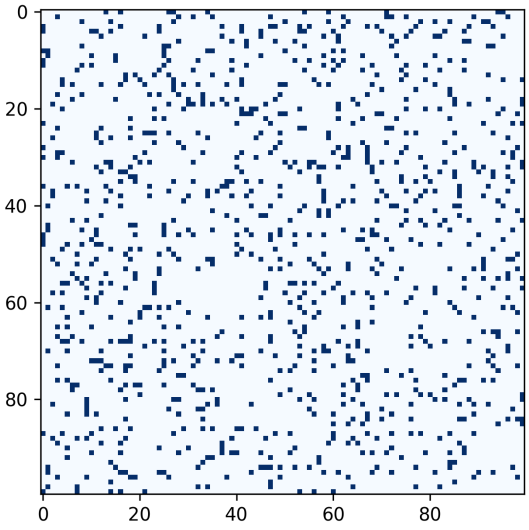
Reflex Agent: After Floor and Agent Path**

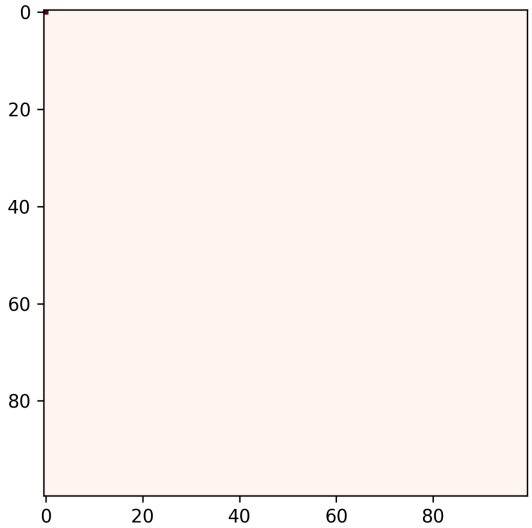




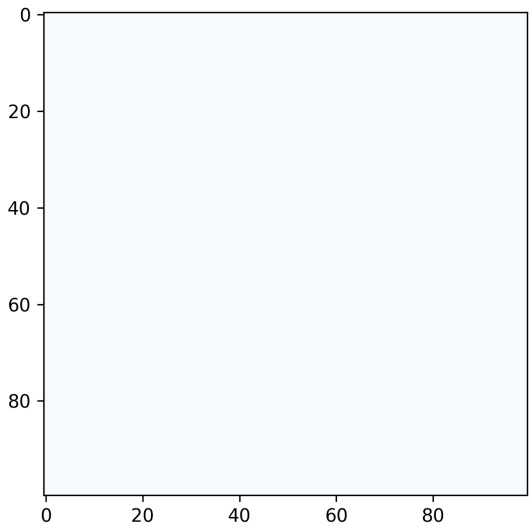
****These pictures show the effectiveness of the reflex agent when cleaning dirt from the environment it's placed in. It picked up a good amount of dirt in the 20,000 moves it could make.**

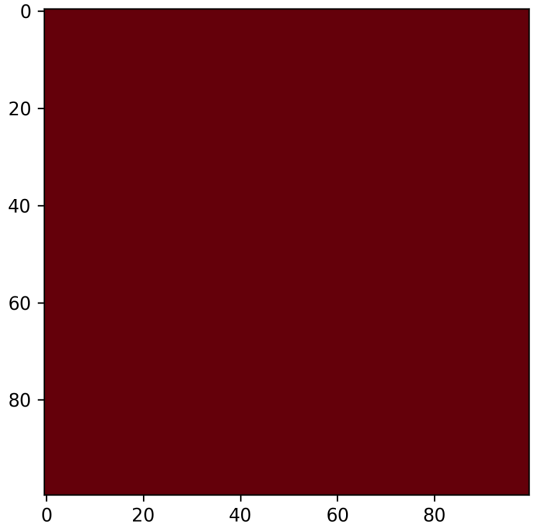
Model Based Reflex Agent: Before Floor and Agent Path





Model Based Reflex Agent: After Floor and Agent Path***





*****These pictures show the efficiency and the effectiveness of the model based reflex agent. The prior history it was given was that it must move row by row in the form of how a snake would move in the grid. This resulted in this agent cleaning all dirt and doing it in less than 20,000 moves.**