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FSMs: We have two general Finite State Machines that correspond to the Ghosts and Pacman.

Each ghost has a different decision tree within each finite state, so we choose not to draw out every decision tree as that would take a long time and be very complicated. Our explanation for each is pretty simple though, we can go over this in each state for each ghost respectively.

(States can be seen below in picture as well as Clyde's General Decision Tree)

Pacman FSM:

Pacman Seek/Eat Pellets: Pacman uses Dijkstra's Algorithm to find Pellets to seek nearby, prioritizing Power Pellets as he searches.

Pacman Chases Ghosts: When Pacman eats a Power Pellet, the ghosts are weak and he paths towards the closest. The Ghosts change back to normal after a short duration.

Pacman Dies: When Pacman collides with a Ghost, it pauses the game and restarts it. This restart switches the map back to the first map, our apologies for that.

Ghost FSM:

Pacman not Eaten Power Pellet:

Blinky: Blinky uses A* pathing to chase after Pacman. Blinky does not use Pacman's updated position every movement though, his knowledge of Pacman's location is only updated every so often.

Pinky: Pinky moves towards Pacman using the logic of, "is Pacman above me, is Pacman to the right of me" and so forth. He chooses with direction of the two (ex: Top-Left) by which is further away.

Inky: Inky runs away from Pacman the same way that Pinky runs towards Pacman, except the direction Inky travels is opposite that of the way Pinky would.

Clyde: Clyde moves randomly based on a random number roll (shown below).

Pacman Eaten Power Pellet:

Blinky: Blinky runs away, similar to how Inky acts when Pacman is in his normal state, moving away as the crow flies.

Pinky: Pinky runs away the same way that Blinky runs away.

Inky: Inky switches behaviors in a funny way, we decided to make Inky A* path towards Pacman when he eats the Power Pellet, this can cause Inky to die rather easily.

Clyde: Clyde still moves randomly in this state as well.

Ghost Death: This is the same for all ghosts. When they die they teleport back to their spawn, and wait a short while before resuming play.

IMPORTANT EXTRA INFORMATION:

TESTING:

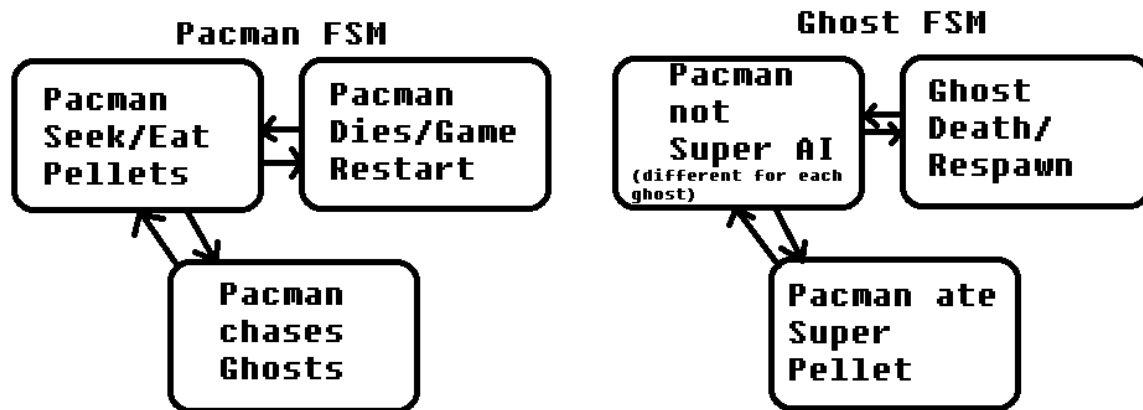
In general we've found that Pacman is really bad at this game. He has a tough time in open areas as both Blinky and Pinky will hunt him down, and even though Pacman is faster than the ghosts, they will eventually cut him off as he still wants Pellets. Pacman also struggles to catch back up to the Ghosts when he eats a Power Pellet, which will put him closer to the ghosts, usually causing him to die. We recommend placing a ton of power pellets to see the game run for a while, and place many in a path towards the ghosts, so that he can actually eat some of them.

Moving Pacman to different areas helps him a bit, but Blinky will always get to him, so he only gets a small amount of freedom to eat pellets, which he will use all of as that's all he knows how to do. The maps allow for no places for Pacman to gain an advantage position wise on the ghosts, which is why the design for the actual Pacman map looks a lot different, and plays a lot better.

ADDITIONAL FEATURES:

Left Click a Pellet to transform it into a Power Pellet as there are none on the map by default.

Right Click on an open space on the map to teleport Pacman to that location, this is useful for testing the behaviors of the ghosts, as Inky and Pinky can seem a bit stupid in their original locations.



(EXAMPLE)
Clyde Decision Tree

