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AI Final Project Conclusions

For this project I was tasked with creating different ghost controllers in the game Ms. Pac-Man. I created six new controllers in totally. Two of those controllers, the convoy and kamikaze controllers, are completely new. The random legacy and randomly smart controllers, combine behaviors of the random and legacy and the random and starter ghost controllers respectively. The final two controllers, the all different and combination controllers, assign each ghost different controllers or a combination of controllers from the four previously mentioned controllers I created. I was also tasked with logging the final score of Ms. Pac-Man when each ghost was using the same controller, all different controllers, and a combination of controllers. I was then tasked with describing the behavior of the ghosts under each controller and analyzing how it affected the final score.

First a brief description of each controller. The convoy controller makes the ghosts behave very similar to a convoy. The red ghost will continuously chase Ms. Pac-Man while the other ghosts will follow the red ghost. The kamikaze controller will make the ghosts behave in an aggressive manner. The ghosts randomly move around the map, head towards power pills when the are close enough to them, and swarm Ms. Pac-Man when a power pill is eaten. The random legacy controller makes each ghost randomly cycle between legacy ghost behaviors. The randomly smart controller makes the ghosts move randomly around the map and run away from Ms. Pac-Man when a power pill is eaten. The all different controller assigns each ghost a different controller from the four previously mentioned. Finally, the combo controller assigns two ghosts the randomly smart controller and assigns the other two ghosts the kamikaze controller.

The effectiveness of each controller was extremely interesting to observer. For each trial I set Ms. Pac-Man’s controller to be the starter one and I logged the final times and score of each trial. As one can tell by looking at the project’s logger file, the final scores and times Ms. Pac-Man receives varies immensely depending on the ghost controller in use. The most effective ghost controller out of the six used was the all different controller. The second most effective controller used was the convoy controller, followed by the combination controller, then the kamikaze controller, then the random legacy controller, then finally the randomly smart controller. From the data contained in the logger file it is very easy to see that controllers that relied heavily on randomization would easily be outplayed by Ms. Pac-Man when using the starter controller. The most successful controllers, the all different and convoy controllers, are successful because they have at least one ghost consistently chasing Ms. Pac-Man. The other controllers usually resulted in all the ghosts sporadically spreading out across the map applying no pressure, giving Ms. Pac-Man free rein to move however she deemed fit and progress throughout each level multiple times.