Project Proposal

By: Ryan Neumann

For my semester project, I will be applying deterministic finite automata to the classic game, PacMan. Specifically, I will be determining the actions of the ghost in different states, as PacMan traverses the map. There are four different states that the ghost assumes, either wandering, chasing PacMan, avoiding PacMan, and returning back to base. While PacMan is not visible to the ghost, it will be wandering. While PacMan is in view, the ghost will begin to chase PacMan. If PacMan eats the dot, otherwise known as the power pellet, the ghost will begin to avoid PacMan. When eaten by PacMan, the ghosts will return back at base.

When designing my project, my main focus will be on the coordinates of PacMan and the ghosts. As PacMan is a two-dimensional game, the only coordinates I will need to worry about is x and y. If PacMan is on the same x or the same y as a ghost, and there is a path in-between, then the ghost will begin to chase PacMan. Similarly, if PacMan is on a separate x or y, then the ghosts will just wander the map.

DFA can be applied to many aspects of PacMan, such as the number of lives, the total accumulated points, the number of bonus items that can be added to the map at any given time, and the ghosts traveling state. As previously stated, I will be analyzing the actions of the ghosts, and how they correspond to the actions of PacMan. Ultimately, there will be four different states, each being directed to a different action. I will be using a 50x50 grid to create the playing board, in order to fit all barriers and extra features.