Project Proposal

**Project Description:**

Pacman 112 is a parody of the original Pacman game. The game consists of a player that attempts to collect all the points before the ghost kills them.

**Competitive Analysis:**

There are many other types of Pacman games out on the internet. They try to replicate the game play of Pacman and have their own twists to them. My project will be different because I will be utilizing various path planning algorithms to make my AI ghosts smart. I will also incorporate a random map generator so that the player doesn’t get bored of playing on the same map each round. My game will also have animations that will keep the audience engaged.

**Structural Plan:**

1. Map Generation File with code
   1. flipAccrossHorizontalAxis()
   2. flipAccrossVerticalAxis()
2. Game File with all game functions
   1. Graphics Functions:
      1. appStarted()
      2. timerFired()
      3. redrawAll()
      4. keyPressed()
      5. mousePressed()
   2. Pacman Related Function:
      1. Move()
      2. isLegalMove()
      3. isTouchingGhost()
   3. General Game Functions:
      1. isGameOver()
3. File for A-Star Search algorithm
   1. Vertex Class
   2. findPath()
4. File for Dijkstra’s Search algorithm x

**Algorithmic Plan:**

I will be using 3 main algorithms in my program. I will utilize a map generation algorithm and two path finding algorithm.

1. Map Generation:
   1. The map is generated using Tetris like pieces that are randomly generated. The pieces are then placed on the map and its edges are used as a path for Pacman. Once the top left quadrant is filled up with the maze, the quadrant is reflected vertically and horizontally.
2. Dijkstra’s Path Finding Algorithm:
   1. Dijkstra’s Algorithm is a breath first based (BFS) algorithm that will search the entire map for Pacman. It will then provide the ghost with the shortest path to reach its destination. The ghost will utilize this path to chase after Pacman.
3. A\* Algorithms:
   1. The A\* algorithm is a depth first based (DFS) path finding algorithm. A DSF is an algorithm that searches for the target as far down as it can, then backtracks until it finds an unexplored path, and then explore it. This algorithm will be implemented on one of the ghosts to chase after Pacman.

**Timeline Plan:**

|  |  |
| --- | --- |
| **Date** | **Goal** |
| 11/16/21 | All basic gameplay |
| 11/20/21 | Get 1 AI to work and reach MVP |
| 11/22/21 | Get 2nd AI to work to go above MVP |
| 11/24/21 | Add extra details to go above MVP |

**Version Control Plan:**

I will use GitHub to back up all my code. After I am done working on my code for the day, I will commit my changes to GitHub.

A screenshot of a computer

Description automatically generated with medium confidence

**Module List:**

I am not planning on using any external modules/hardware/technologies

**TP2 Update**

Decided to add power ups to the game. Now when Pacman eats the cherry, the ghosts will run away from Pacman.

**TP3 Update**

Decided to add a custom map generation mode. The player can create their own map and then play on it! You can also now save your scores which will be presented if it is in the top three in the leaderboard section. The scores will be updated in a recursive manner and will be saved using file IO.