

Pac-Man Arcade Game Requirements

1. The solution must support Pac-Man movement.
 - a. The solution must allow the player to move Pac-Man using the arrow keys.
 - b. The solution must prevent Pac-Man from moving through walls.
 - c. The solution must reset Pac-Man to the starting position after he loses a life.
 - d. The solution must display the number of remaining lives.
2. The solution must support pellet collection.
 - a. The solution must place pellets throughout the maze.
 - b. The solution must detect when Pac-Man collides with a pellet.
 - c. The solution must remove a pellet after Pac-Man collects it.
 - d. The solution must track the player's score in real time.
 - e. The solution must display the player's score during gameplay.
3. The solution must support power pellet functionality.
 - a. The solution must place power pellets in designated maze locations.
 - b. The solution must detect when Pac-Man collides with a power pellet.
 - c. The solution must apply a weakened state to all ghosts when a power pellet is collected.
 - d. The solution must restore ghosts to their normal state after the weakened duration ends.
4. The solution must support ghost behavior.
 - a. The solution must move ghosts autonomously.

- b. The solution must detect when Pac-Man collides with a ghost.
 - c. The solution must remove one life from Pac-Man when a ghost collides with him in normal state.
 - d. The solution must allow Pac-Man to defeat ghosts when they are in a weakened state.
 - e. The solution must maintain consistent ghost behavior patterns across play sessions.
 - f. The solution must increase ghost speed in higher levels.
5. The solution must support maze display and environment.
- a. The solution must display the maze layout during gameplay.
 - b. The solution must ensure all maze elements remain visible at all times.
 - c. The solution must support both windowed and full-screen display modes.
6. The solution must support level progression.
- a. The solution must provide multiple levels with increasing difficulty.
 - b. The solution must save the player's progress between levels.
7. The solution must support game flow and state management.
- a. The solution must end the game when Pac-Man loses all lives.
 - b. The solution must display a Game Over screen when the game ends.
 - c. The solution must pause all movement when the player activates the pause function.
 - d. The solution must prevent pausing during cutscenes or transitions.

8. The solution must meet performance requirements.
 - a. The solution must run at a steady 60 frames per second during gameplay.
 - b. The solution must maintain consistent performance across all levels.
9. The solution may support audio features.
 - a. The solution may include sound effects for actions such as eating pellets or losing a life.
 - b. The solution may include background music that loops seamlessly.
10. The solution may support optional user experience enhancements.
 - a. The solution may include customizable key bindings.
 - b. The solution may include visual indicators showing when ghosts are vulnerable.
 - c. The solution may include a tutorial level explaining basic controls.
 - d. The solution may include a local high-score leaderboard.
11. The solution must support fruit bonus items.
 - a. The solution must spawn fruit bonus items at specific times or score thresholds.
 - b. The solution must display the correct fruit image based on the current level.
 - c. The solution must detect when Pac-Man collides with a fruit bonus item.
 - d. The solution must award bonus points when Pac-Man collects a fruit bonus item.
 - e. The solution must remove the fruit bonus item after it is collected.
 - f. The solution must remove the fruit bonus item if it remains uncollected after a set duration.