



PAC-SNAKE

Game Design Document

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1. Introduction

Pac-Snake is a unique arcade-style game combining the mechanics of two classics: Pac-Man and Snake. The player navigates a maze, collects coins, and avoids enemies while trying to grow their body like Snake. The game is simple to pick up but challenging to master as players balance collecting points and avoiding death by managing an ever-growing body.

2. Game Vision

Objective:

The goal of Pac-Snake is to collect as many coins and power-ups as possible, grow the player's body by consuming ghosts after gaining power-ups, and ultimately fill the game board with the body of the player character without dying. The game's design focuses on providing a nostalgic arcade experience while introducing new layers of strategic complexity.

Target Audience:

- Casual gamers who enjoy high-score-based challenges**
- Fans of retro arcade games**
- Players who enjoy simple but increasingly complex mechanics**

Platforms:

PC

3. Game Rules and Mechanics

Game Rules:

- 1. The player navigates through a maze to collect coins and avoid ghosts.**
- 2. Collecting a power-up enables the player to eat ghosts, extending their body by several segments.**
- 3. The game ends when the player either collides with their own body or is hit in the face by a ghost when not powered up.**

Mechanics:

- **Movement:** The player moves in four directions (up, down, left, right) in a 2D maze.
- **Growth:** Each time the player eats a ghost, their body grows longer by adding segments. These segments remain stationary after growth.
- **Power-Ups:** The power-up grants temporary invincibility and the ability to eat ghosts. This effect lasts for a set duration (e.g., 10 seconds).
- **Respawn Mechanic:** Coins and power-ups respawn every 10 seconds, creating continuous opportunities for growth and point accumulation.

Key Features:

- The player's face is the only vulnerable part that can be hit by ghosts. The player can safely collide with their own body but must avoid their face being hit by a ghost.
 - The player's body grows longer after each ghost eaten, increasing the difficulty of avoiding their own tail while moving through the maze.
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4. Gameplay Elements

Core Game Features:

- **Arcade Challenge:** The player must balance avoiding ghosts and filling the board with their body while aiming to collect as many points as possible before dying.
- **Power-Up System:** Strategic use of power-ups enables ghost consumption and body growth.
- **Respawning Coins and Power-Ups:** Coins and power-ups respawn every 10 seconds, which forces the player to continue moving and creates new strategic opportunities.

Control Scheme:

- **PC:** Arrow keys or WASD for directional movement. Xbox Controller support.
- **Power-Up Activation:** Automatically activates upon collection.

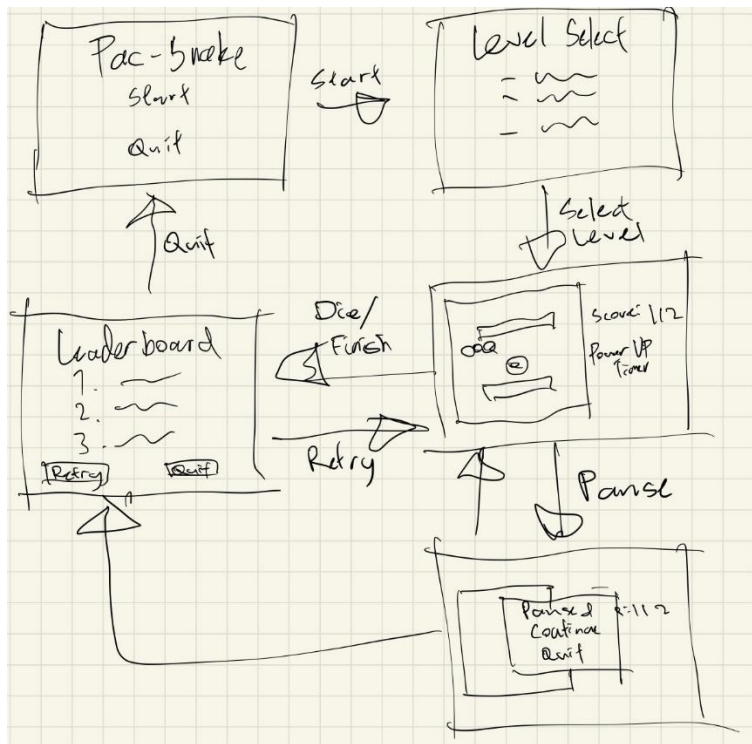
Key Algorithms:

- **Ghost AI:** Ghosts follow predefined patterns within the maze. Upon power-up activation, ghosts avoid the player character for a set time.
- **Collision Detection:** Checks for player interaction with walls, coins, power-ups, ghosts, and their own body. If the player collides with their own body or is hit by a ghost without a power-up, they die.
- **Growth Mechanic:** Each time the player eats a ghost, the body extends by a set number of segments.
- **Respawn System:** Coins, power-ups and ghosts respawn on a timed interval and at randomized locations, ensuring that no item overlaps with walls or the player's body.

Cheat Features:

- **Invincibility Mode:** Temporarily turns off collision detection with ghosts and walls, allowing the player to move freely without dying.
- **Infinite Power-Up:** Grants unlimited power-up effects, allowing the player to eat ghosts indefinitely without the timer expiring.

5. User Interface



Main Menu:

- **Options:** Start Game, Options, Exit
- **Retro arcade-style pixelated UI** with an animated background.

In-Game Screen:

- **Top HUD:** Displays the player's score, power-up timer, and player length (body segments).
- **Bottom HUD:** Lives remaining (if applicable) and current level indicator.
- **Main Game Area:** The 2D maze with a top-down view, where the player character, ghosts, coins, and power-ups are displayed.

Pause Menu:

- **Pause Overlay:** An opaque overlay with options to resume the game, restart the level, or quit to the main menu.

HUD (Heads-Up Display):

- **Score:** Shows the current accumulated points.
- **Power-Up Timer:** A countdown indicating how much time remains before the power-up expires.
- **Length Counter:** Displays the current length of the player's body segments, giving a visual indication of progress.

6. Required Assets

Sprites:

- **Player Sprite:** A round character (similar to Pac-Man) with animated body segments.
- **Ghost Sprites:** Several colorful ghosts with unique designs and animations.
- **Coin Sprites:** Small, shiny coins that the player collects.
- **Power-Up Sprites:** Special glowing orbs that grant temporary abilities.
- **Wall/Tile:** Tile sprite with repeatable pattern.

Animations:

- **Movement Animations:** Player movement in four directions with a smooth transition between body segments.
- **Ghost Animations:** Chasing and fleeing animations depending on the power-up state.

Sound:

- **Background Music:** Looping chiptune music to set the retro arcade mood.
 - **Sound Effects:**
 - **Coin Collection:** A soft chime when a coin is collected.
 - **Power-Up Activation:** A rising tone when a power-up is collected.
 - **Eating Ghosts:** A satisfying crunch when a ghost is consumed.
 - **Death Sound:** A distinct sound for when the player dies or the game is over.
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7. Bibliography

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This game design document outlines the vision and gameplay mechanics of Pac-Snake. With its unique combination of two iconic game genres, it aims to provide an engaging and challenging experience to players of all skill levels while offering endless replayability through a classic arcade framework.