Writeup for ps5.cpp

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How to Use the Program:

1) When you run the program, it will automatically start a game where you control Pac-Man.

2) You can move Pac-Man around the screen using the arrow keys (Left, Right, Up, Down).

3) Your objective is to collect all the blue stars while avoiding the red ghost obstacles.

4) As Pac-Man eats a star, it gradually turns from yellow to blue and stays blue for a while before transitioning back to yellow.

The game ends in two cases:

- If you collect all the stars, you win.
- If Pac-Man hits a ghost, it starts fading and the game ends with a "Game Over" message.

5) You can press the "ESC" key at any time to exit the game.

Features Used to Satisfy the Requirements:

OpenGL Animation with Double Buffering:

The program uses `glClear` and `FsSwapBuffers()` for smooth animations and to handle the continuous frame updates needed for the game.

Interactive Program:

The game is fully interactive, responding to user inputs via keyboard controls to move Pac-Man, making it reactive and playable in real-time.

Alpha Blending:

Alpha blending is used in two places:

- When Pac-Man eats a star, its color gradually transitions from yellow to blue and back to yellow over time.
- If Pac-Man collides with a ghost, it fades out by reducing its alpha value until disappearing completely, signaling a game over.

OpenGL Primitives:

- `GL_TRIANGLE_FAN` is used for drawing Pac-Man and ghosts.
- `GL_POLYGON` is used for drawing the ghost's body, and `GL_QUADS` for Pac-Man's eyes.

Math Library Functions:

The program uses `cos` and `sin` from the math library to calculate the positions of vertices when drawing circular shapes, such as Pac-Man, the stars, and ghosts.

State Transition:

The program uses state transitions to manage the different game states, such as `PLAYING`, `FADING`, and `GAME_OVER`, ensuring smooth game flow and appropriate behavior for each state.