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CSCI 437 Pong Homework Report

Time required for core requirements: Around 19 hours

Time spent on bonus features: Around 14 hours

Additional external libraries: I only used standard C++ libraries.

Core features that do not work correctly: All of my core features work properly from testing on my machine and the school computers. I disabled the random perturbation for bounces on the top and bottom edge of the playing field because there were times when the ball could have its direction changed. This bug occurred after I implemented the bonus feature for the ball to take the paddle direction.

Implemented bonus features:

- **Window resizing** with sf::View. It works correctly, I did notice that the starting window size can be different on the school's machines but the game is still resized properly.
- **Sounds**: I took sounds from my favorite game (Super Smash Bros. Melee) and added them to the menu, pause screen, when the ball bounces, when scoring a point, and to the game over screen.
- **Paddle Acceleration:** It works for the player's paddle, I decided to disable it for the AI player because the game needed to be more balanced.
- **Ball takes paddle speed and direction into account.** This works well in my experience, you can essentially aim the ball now. There were quite a few bugs with the ball bouncing weirdly and going through the paddle but I have made these bugs occur less frequently if at all.
- **User selectable difficulty:** I implemented this in a different way than listed in the homework. Difficulty is simply the effectiveness of the AI, which boils down to two variables: response distance and the AI's paddle speed. Easier AI can only move when the ball is closer to their paddle and their paddle moves more slowly. The "Cruel" AI can move slightly faster than the player and is always trying to be level with the ball.
- **Title screen with selectable options:** I have a main menu with ability to exit, play a game with default parameters, and the ability to choose your own options. You can change your color, the opponent's color, the difficulty, the game speed, and the side of your paddle.
- **Visuals:** I tried to find a font that matches what one would expect from an Atari game. I added a trail to the ball to show motion; the trail gets longer as the ball's speed increases. The ball and trail also change colors to the paddle that hit it. This is so the player can know which direction the ball will move at the beginning of each point.
- **Adaptive framerate**: Game runs at roughly the same speed on my machine and school machines.