Link

https://spudoku.github.io/Bucketball-Clone/

The Mechanic: Trajectory Prediction

When the mouse is clicked, the ball projects a predicted trajectory based on the initial velocity that would be applied. It uses semi-transparent GameObjects, called “pointers” in the code, to show the given prediction. The exact equations for determining the position of a “pointer” are as follows:

X = V0 * cos(theta) * t
Y = V0 * sin(theta) * t - 0.5 * g * t^2

Where:

V0 = initial speed (Not velocity, this is important)
Theta = launch angle
G = gravity
T = time, in seconds.

With these equations, it just becomes a matter of spacing out the pointers. This is controlled with an “interval” variable, which indicates the “space” between each pointer in units of seconds. For example, if “interval” was equal to 0.5f, this would mean that the second pointer would show the position of the projectile half a second after it reached the first pointer.

You can alter the number of pointers and the interval between them.

This project does not account for interactions with other objects; it assumes there is an unobstructed path.

Controls

The only controls are to drag and release the mouse, launching the ball like a slingshot. An aim system assists the player in finding a trajectory.

Ball (Player) Behavior

Once launched by the player, the ball bounces off of blue obstacles relatively hard, or even more intensely when colliding with pink Bouncers.

If the ball gets in the bucket (detected by a trigger in the bucket), it will play particle effects before advancing to the next level.

The ball may change color if going through a green or orange Color Changer. The ball's color must match that of the bucket in order to win the level.

Time to Complete, Challenges and Learning

Time to complete: roughly 8 hours

Challenges and Learnings

- Trajectory calculations for the aim assist mechanic
- Level design and bounciness: modifying bounciness to enable bouncing off of walls as a key feature without the ball bouncing out of the bucket too easily
- Delays between ball collisions and sound effects playing