***Video Link**: https://youtu.be/2pdgOL_8qcs*

Final Report

Game Title: **Angry Apple**

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Short Description:

Ever want to shoot bird with an apple? Well here is your chance! Angry apple is a projectile motion based 2D shooting game. It design to test your prediction skill where we don't tell you how far the apple will go. You have to play it and get a feel for it. There is also physics in the collision where if there is not enough force, then you won't break anything. The brick wall is also a obstacle for you to deal with. It will constantly break down to half size. If you break you might just have created a safe barrier for the bird. Angry Apple lets you prediction and strategize the gameplay. Try it out!

Fuller description

Gameplay:

1. Start with starting_scene, input player name and number of bullets needed (any positive integer input is fine). Then, click on play button and the player will be led to the playground. The playground is setup once the player enters.
2. Some information are displayed around the top area of the screen:
    a. Player name: the play name input in starting scene
    b. Cannon status: current status of cannon. Cannon status is "ready" in the beginning. Once a bullet is shot, the status becomes "waiting" and the cannon won't be able to shoot during this status. Once the bullet stops moving Or is lost in the deep (fall off the platform), we say that current round is over, and the status is reset to "ready". Then, cannon would be able to shoot another bullet.
    c. Wind speed: current wind speed of the time. Wind speed would update after every bullet shot. Wind speed determines the wind effects (continuous force) on the bullet.
    d. Bullet count: number of cannon bullets left. If you shot out all the bullets and have not killed all the birds, you would lose (and the cannon won't be able to shoot more bullets).
    e. Birds left: number of birds left in the playground. You goal is to kill all the birds in the scene (by shooting them with bullets OR 'kick' them off the platform and fall

to death). You win immediately once all birds are killed (even if that's your last bullet).

3. Try use up/down arrows to rotate the cannon (360 degree) to find the projection angle you want. Once the angle is ready, press and hold SPACE to adjust the power of the bullet. The longer SPACE is held, the more impulse force will be given to the bullet (the bullet can be shot farther and more powerful). There is a max power you can reach if you hold SPACE long enough. Release SPACE once ready to shoot.
4. To win the game, the player should take in consideration of the structure of wooden framework, positions of the birds, wind speed, projection angle, and power of bullet.
5. Message will be displayed once you win the game (killed all birds), or lose it (run out of bullets). You can press R to start a new level of the game.
6. Player may press 'Q' to quit to menu, or press 'ESC' to quit the program at any time of the game.

Notable Features:

-recursive wall breaking: the wall will break down half of its original size each time, with the position of left and right for horizontal wall, up and down for vertical wall. The wall will stop breaking and disappear after a fixed size.

-bird explosion: bird will change animation when hit and disappear after a few second.

-bird impulse detection: birds will be able to continuously detect incoming force/impulse and triggers explosion if the impulse exceeds certain limit.

-cannon 360 rotation & projection: cannon is able to shoot bullets with a 360 degree rotation angle (i.e. any angle in 2D), where the bullet will receive impulse in that angle.

- wind speed: wind speed is generated randomly and updated every round (it will affect every shot you make).

Credits:

Ran – Game logic (gameplay conditions, notifications), Cannon and Bullets (Projection geometry and physics), Environmental conditions (wind speed), bird collision physics.
Yufan – Scene build-up (setup of game scene, prefabs), animation resource seeker, breakable wooden frame/wall logic/collision physics, bird explosion logic.

External Resources:

https://answers.unity.com/questions/1002705/is-there-a-way-to-dynamically-attach-a-script-to-a.html
https://docs.unity3d.com/ScriptReference/Collider2D.html
https://docs.unity3d.com/ScriptReference/PlayerPrefs.html
https://stackoverflow.com/questions/36387753/getting-collision-contact-force
Unity asset store