IMD CA2 3D Pool

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Approach Taken

The Approach to making the 3D pool game was to first try out other free pool games available on the internet there were multiple games available with different types of controls for the cue like moving the mouse or arrow keys and different ways to select amount of force you want to use on hitting the ball by either using the mouse and depending on how far you pull back is the amount of force you will give and many other ways were found too.

Looking at how different games handle how balls behaved when force is applied gave me a good understanding on how reactionary the balls should be and how much do they bounce off the cushion parts of the table.

Game Features

Controls

I have chosen to control the Cue and the Main Camera with the Mouse by moving it left and right you can adjust the direction the Cue Ball is going to take which is marked with a line.

Holding the Left Mouse Button freezes the Main Camera rotation and gives you the ability to move the Cue up and down with the Mouse, moving it up fast to hit the ball applies a larger force than if you move it slowly towards the ball.

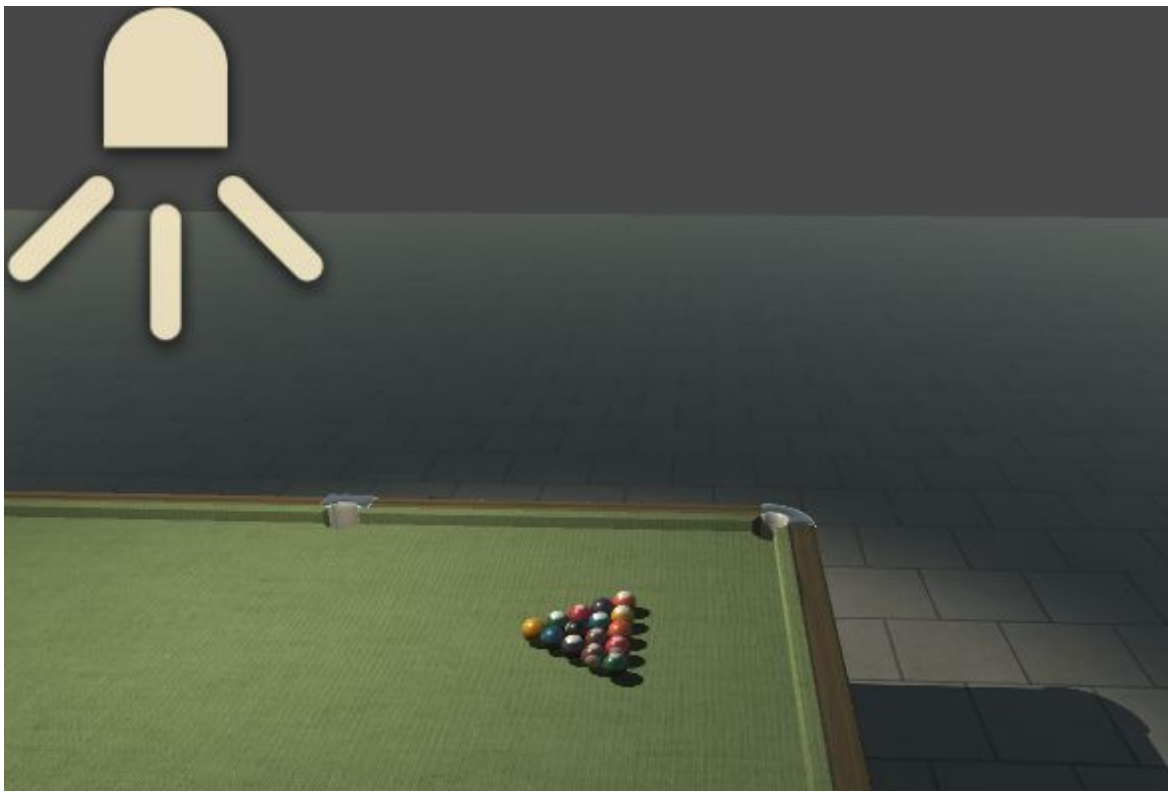
Clicking Spacebar switches the camera view between the main first person perspective to a top down perspective.

Physics

Balls collide and interact with each other in a realistic manner and bounce off the table cushions and lose momentum.

Lighting

A realistic slightly tinted light is above the table that illuminates only the play area and makes the balls cast a small shadow depending on where the ball is and adds extra shine and reflection to them.



Scoring

The game takes turns between two players the first type of ball potted is assigned as the type that the player needs pot in order to be able to pot the 8 ball to win the game, the score, types and who's turn it is are displayed on the UI. If the 8 ball is potted early the user who did it is shown as the player who lost on the UI and the game can be reset.

Challenges And Solutions

Controls

It was challenging to find a good solution that works for the controls as there are multiple ways to implement a control scheme that works, a simple solution would be to just control everything with the keyboard but I wanted the mouse to be what controls the movement of the cue.

At first I set up the camera to rotate around the ball and then tried to have a similar script for the cue to also rotate around the ball but multiple problems arose as the rotation of the cue would not be at the angle I wanted it to be at and as I rotated it around the ball it would always be different.

To solve this issue I tried different rotation scripts but nothing worked so instead of writing any scripts the better solution was to just child the cue to the camera and keep some of the scripts where the cue would point towards the ball, this solved my issues with getting the cue movement the way I wanted it.

Physics

At first when I imported the pool table i had found on the internet and started playing around with the physics of the balls they seemed to be a bit slow as when I dropped a ball down it travelled too slowly this seemed to be incorrect.

After some research I learned that Unity uses realistic values for their physics calculations and the table when I first imported it in a realistic scale the table was giant and this was why the gravity seemed so low to fix this I could either up the gravity number on Unity or scale down my objects to a realistic value.

Lighting

There are multiple light types to choose from in Unity, point light gave me the desired effect but the balls were not casting shadows on the table, to fix this I needed to fix the light settings and set the Bias to be 0.001 to have the light be able to cast a shadow on the balls.

References

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Table: https://archive3d.net/?a=download&id=52cc9877

Camera Rotation:
http://answers.unity3d.com/questions/600577/camera-rotation-around-player-while-following.html

https://docs.unity3d.com/ScriptReference/Vector3.MoveTowards.html