

# Unity CA2 3D Pool Game

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1.

**The approach taken** was to look at arcade style games, the goal was to recreate a more game like version of Billiards than a pool simulator, to do this I looked at various games with additional minigames such as billiards and snooker and tried to simulate the feeling. To this end I used a created a easier to play game that does not rely on more advanced techniques found in more simulation like games.

## 2. Game Features:

The game's features include ball direction and momentum based physics using relative force on the pool cue's z axis this means the ball will receive force based on the cue's z axis and not its own.

The game's balls are set to collide and bounce of each other like using a collider with a physics material set to allow bouncing with each collision. The same goes for the table edges with different levels of bounce set.

The Pool cue is set to pivot around the white ball this is used to aim the cue and shoot it in the direction of the ball when the cue hits the ball it is destroyed to respawn the cue the player has to hit the **spacebar** to spawn another cue this will also switch the turn indicator to the other player.

The lighting used for the game is a spotlight this light is aimed down at the table and generates shadows on the table, balls and cue.

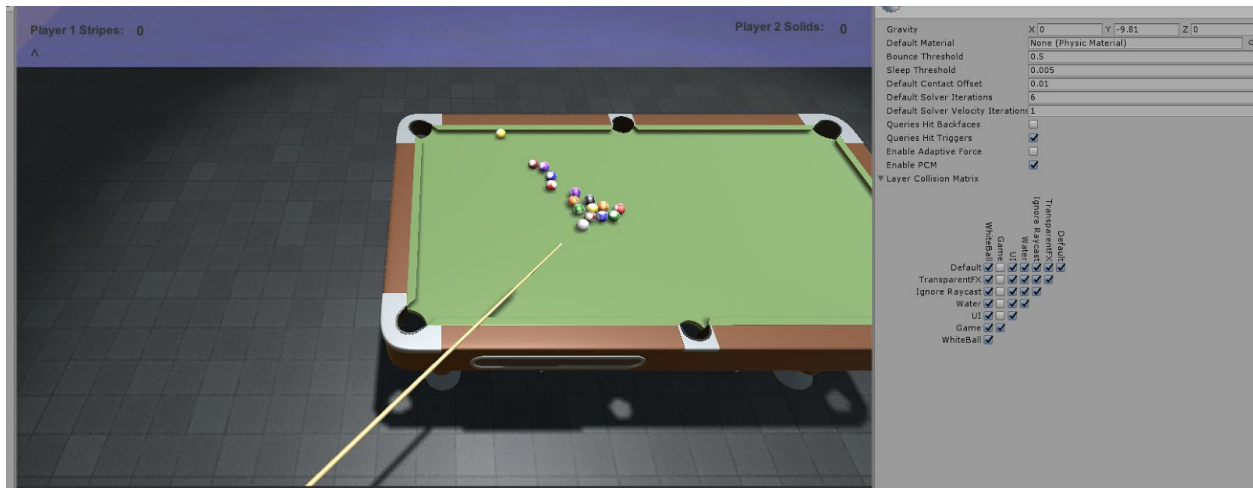
The camera follows the white ball using a rigidbody, in the case of the white ball falling off the table the camera resets to the default position in the center of the table.

### 3. **Challenges and Solutions:**

The challenge of this project was the physics the balls would seem to floaty and not at all like a real pool game this caused issues with the gameplay making it easy to score because of the size of the pool table model used and the way unity calculates physics the settings had to be adjusted to accommodate the size of the table to fix this I increased the gravity and mass of the balls.

Another issue was the lighting, the spotlight would only cast a shadow on the pool table to fix this issue the bias setting had to be set to 0.01

The next issue is the controls in order to rotate the cue around the white ball I had to use a pivot this solution works but if the spacing is off by a certain amount the cue would miss the ball the solution to fix this issue was to lock the rotation of the cue and use the layer collision matrix to set what the cue could collide with



## References:

### Unity Physics:

- <https://unity3d.com/learn/tutorials/topics/physics/bouncing-ball?playlist=17120>
- <https://docs.unity3d.com/Manual/class-ConstantForce.html>

### Ball Objects :

- <https://www.assetstore.unity3d.com/en/#!/content/6353>

### Table:

- <https://www.cgtrader.com/free-3d-models/sports/game/billiard-pool-table-4a97b4bb488c81810c3f044c2b44473a>