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| IMD CA 2  3D Pool Game | Abstract  Report on development of a 3D Pool Game created with Unity.  Michael Smith  X00107586 |

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# Introduction

The topic for the second continuous assessment assignment in our Interactive Media Development module was to design and develop a 3D pool game using the Unity framework.

# Approach taken

## Roll-A-Ball

My approach to this game was to first watch the Roll-A-Ball tutorial that was on the Moodle page. This tutorial gave me a very basic idea of movement and how I could implement the pockets for the pool table and scoring. I decided before I began the game that I wanted to try and create as much of this game as possible instead of using prebuilt models for the table and such so I was looking forward to the challenge of creating this game.

## Creating the table and movement of cue ball

The Roll-A-Ball tutorial showed me the basics of creating a plane as a table so I created my own plane set about building my own pool table and setting the properties to the aspects I wanted for my game. I then created multiple balls and added them to the table. I did not think that these balls looked great so after being informed by other students that there was an asset pack on the Unity Asset Store that contained pool balls I decided to go with them instead as they looked more realistic than the ones I created myself. I then created the scripts to control the movement of the cue ball. I originally based the movement of the cue ball off the Roll-A-Ball tutorial were the user had the ability to move the ball in any direction but I changed this so that the user could only move the cue ball in a straight line as this is more in line with how real pool is played. So, when the user takes a shot they cannot turn the ball left or right once the ball is in motion.

## Cue

Once I had the movement of the cue ball somewhat working I wanted to add the cue stick to the game. I added created the cue object and started working on a way to make it so that the cue would hit the cue ball and then the cue would disappear until the cue ball came to rest again but again could not get this working so I decided to attach the cue to the cue ball and make it so that if the cue ball reached a certain speed the cue would disappear, but again could not implement this. I decided to include the cue and attach it to the cue ball but when the user takes a shot the cue will disappear.

## Pockets

For the pockets on the table I decided to create cylinder gameObject and shrink them down so that they were flat and then add them to the table as the pockets. These pockets control the scoring system of the game along with the Scoring System script.

## Aiming System

For enabling a user to be able to choose a direction that they wanted to shoot I created a third person camera view script and attached this to the main camera. This enables the user to rotate the camera using a mouse and select a direction that they want to shoot. I decided to focus the camera on the cue ball as this is the point of view that the user would be aiming from and this allows for more accurate shots. I anchored the camera so that the user cannot rotate the camera in a 360-degree view but instead they can change the view from a low angle to a higher angle to give them a better view of the shot. I wanted to add an aiming line to the game so that the user could see where they were aiming but due to time constraints I could not get this feature implemented.

## Scoring System

Regarding scoring, I wanted the game to be a turn based game so that player one goes first and continues until they miss a shot or make a foul and then it would switch to player two but I could not get this working the way I wanted. Instead I have the game working so that there are two score counts, one for spots and the other for stripes and the users will decide which they are based on the first ball they pot. I implemented some of the rules that apply to pool so I have the game working so that if a user pots the black ball before potting all of their balls they will lose and the game will end. Also, if a user pots the cue ball the ball will reset to its original point when the game started. I had an issue with this though as the ball will continue to roll once it is reset to its starting position.

## Extra Feature: Music

As an extra feature, I decided to add some background music to the game. I noticed during research that a lot of the online games had a nice piece of background music so I thought this would be a nice addition. If I had more time I would also have like to add sound effects to the balls themselves.

# Challenges

I found this CA to be very challenging, the lack of information online meant that it was very hard to implement some of the features for the game. Apart from the Roll-A-Ball tutorial there is no information or tutorials on how to create a pool game so most of the features to be implemented were up to myself to figure out and this was extremely difficult. I did manage to find some of the necessary information but for most the CA It was a lot of guesswork.

The most challenging aspect of the game was the getting the cue to make contact with the cue ball and then have the cue disappear until the cue ball came to rest and then it would reappear. I really wanted to implement this feature as it is the main way that people play pool but there was no information online about how to get this to work so I had to go with having the user use the cue ball instead of the cue.

The camera was also a major issue as I wanted to position it correctly and also make it so that the user could rotate the camera around the cue ball to aim in a certain direction. I was stuck on this part for quite some time but I managed to eventually come up with a solution that I think works well within the game.

Another issue was that a user can take a shot while the cue ball is still in motion. I tried to fix this by disabling the W key but could not get this to work properly.

# Conclusion

In the end, I was happy with what I managed to get together, although not fully functional I think most of the aspects of the CA were achieved to some degree. This is a CA that I would actually like to continue developing as I like the idea and learning some new things about the Unity framework.

# References

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