Steven Young

Games Development Pipeline: Assignment 2

Rube Goldberg Machine

When I first started development on my Rube Goldberg machine I opened up Unity and had a play with the physics to see what kind of things I could do just with the physics engine alone, this is why it starts simple with only the cliché dominos and the seesaws. (Figure 1 and figure 2).

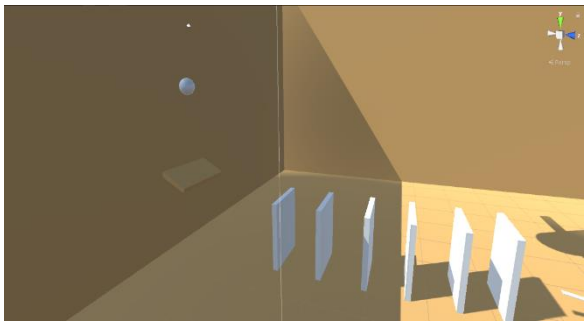


Figure 1

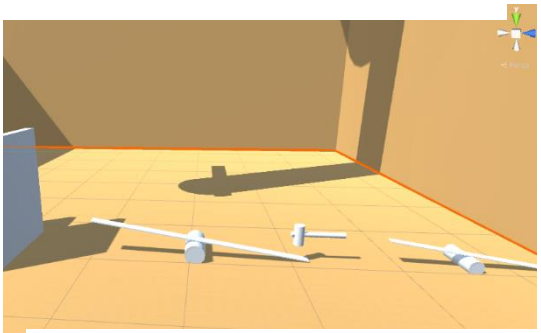


Figure 2

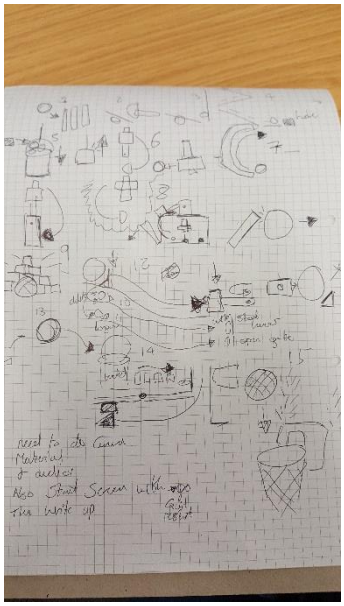


Figure 3

After I had played with the physics and got a feel on the engine I moved to pen and paper (Figure 3.) and youtube to plan out the project, I watched a few videos to see if I can find inspiration for any ideas and came up with one draft and then later came up with a second draft.

My first hurdle I had to overcome was creating the Bell and Hammer (figure 4) mechanism, inspired by the ones you find at festivals. I tried a few different pieces of code to come up with the solution but It kept on going through the trigger I had set and would not take into account collision, after an hour of tinkering I had found that on collision with the top part of the machine I can just freeze the bells position.

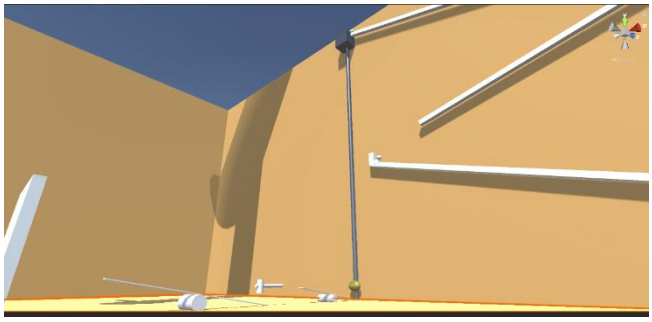


Figure 4

After the Bell hits the top I wanted to mimic the force pushing the ball

l down the ledge (figure 5), I did this by making a script that deleted a public game object if the collision was by gameObject.name, I then later altered this code for easier use and implantation by having 2 public game objects. This allowed the script to be used on any object I pleased.

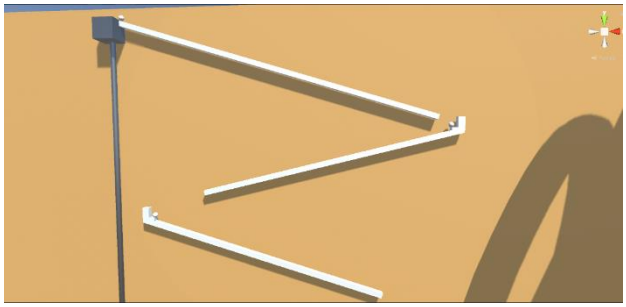
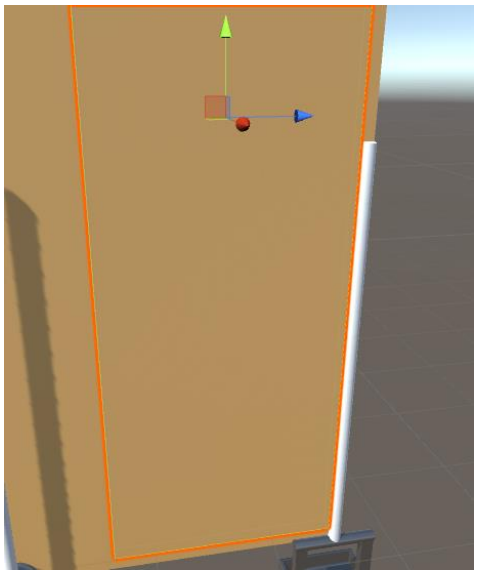


Figure 5

After this I had the ball roll towards the wall and I was going to have it change direction to follow the next wall along. Instead of this I thought I would make it interesting by having a secret door (figure 6) in the wall. i thought it was a nice surprise and after showing some other students they too were surprised thinking that the machine was finished up to that point.



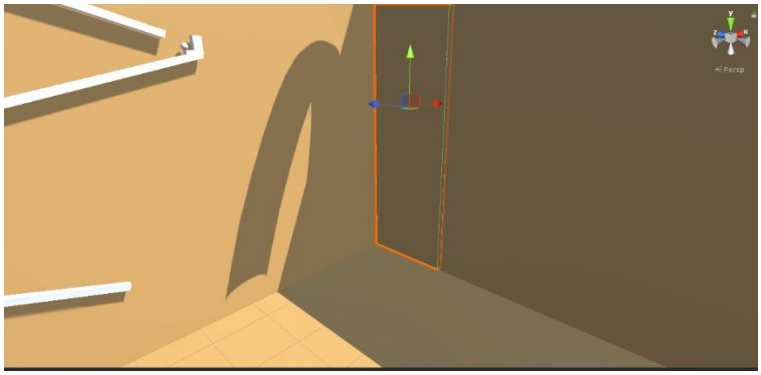


Figure 6

When the ball rolls out I wanted it to fall into a pulley system. Spending a while looking around seeing what I could do I figures it would be best to use camera trickery and 2 separate moving groups of object. When the ball falls into the bucket/basket it start to fall. I then used a code similar to that of the bell. As the basket falls the ball will come into contact with a trigger and this will send up the weight. I had also times this to allow the camera to focus on each without too quick of a change. (Figure 7). I chose this design as it would seems very complicated and is also quite rarely used in these machines due to the complexity.

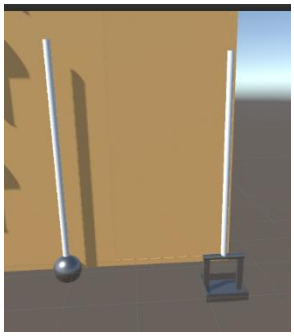


Figure 7

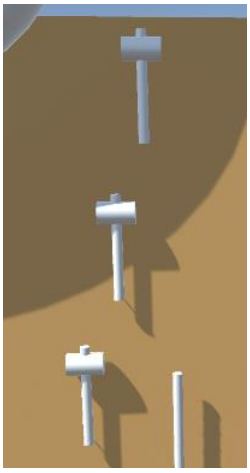


Figure 8

As the weight floats up it collides with a hammer that is sat carefully on a hinge, it swings round and knocks another hammer leading into a series of four hammers in total. This required no code and only used physics and components. I had chosen to implement this as it was pleasing to eyes seeing the hammers knock into each other. (Figure 8)

When the last hammer swings it collides with a ball with a series of 'loops'. When I first tried this the ball could not make far up at all. So I had scripted a few trigger boxes adding force and extra force added to the hammer on collision enter. This idea came to me from Sonic the Hedgehog series, I wanted to see if I could implement a similar idea. Though it looks a bit jolty it was the only way I could think of getting the ball through the obstacle. (figure 9).

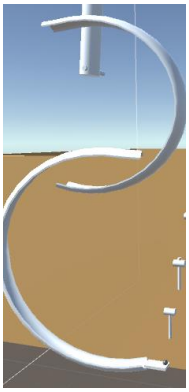


Figure 9

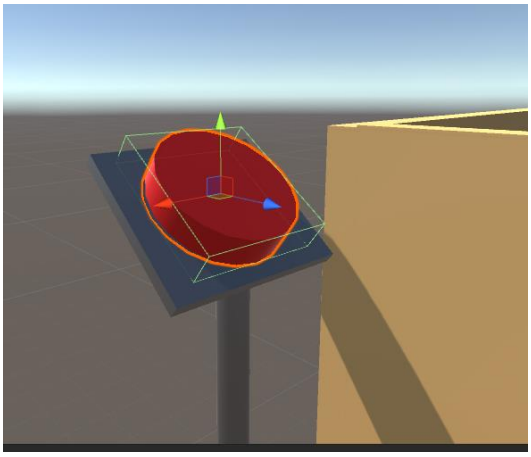


Figure 10

After the ball has finished making its way round the 'loop' it falls off into a switch, at this point I had realised that I could not make an overly 'natural' way to the next part of the machine, so I thought a model of a big button would help see through to the next part. I was very happy with this script, I had a on collision delete object used as stated earlier, an empty object with collision was holding up the hammer. This then works with the next script mentioned in the next paragraph. (Figure 10).

As you can see from my sketches everything seems to be getting bigger and grander. I thought to myself it would be an interesting Rube Goldberg machine if it destroyed part of its self and throw its wall (in engine) miles away. This part I was really excited to see, something that would normally be a finally be in the middle of the machine. I managed to script this with trigger. The wall has Kinematic active and the hammer falls through a trigger that turns this off (Figure 11).

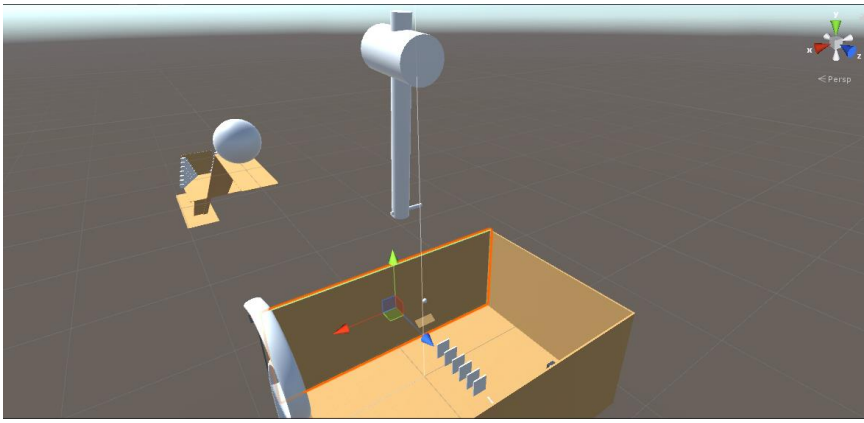


Figure 11

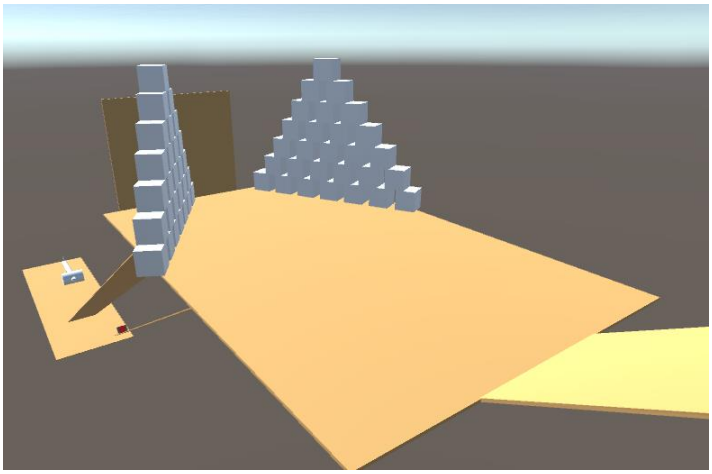


Figure 12

After the wall flies great distances I would like its weight to be relative to the next device. It collides with a giant ball. The ball tumbles down a series of ramps, I initially had the idea for the ball to collide head on with a stack of blocks but blocks ended up getting in the way and ruining the rest of the machines and triggers. So I opted to have them still but put them to one side so you still get the explosion but they don't quite get in the way. I put zero gravity on the blocks to give of this slow-motion feel to the collision. (Figure 12).

After the collision with the blocks the original idea was to have the big ball set off a smaller ball to set off a switch, but I couldn't seem to get the timing right. So I kept the same idea but instead I had a door in place (Figure 13). The small ball rolls down a ramp underneath the big ball, it then collides with another switch (Figure 14) that sets the door free, using the code from the giant hammer and then deletes an empty child with collision to allow the motorised hammer on a hinge spin.

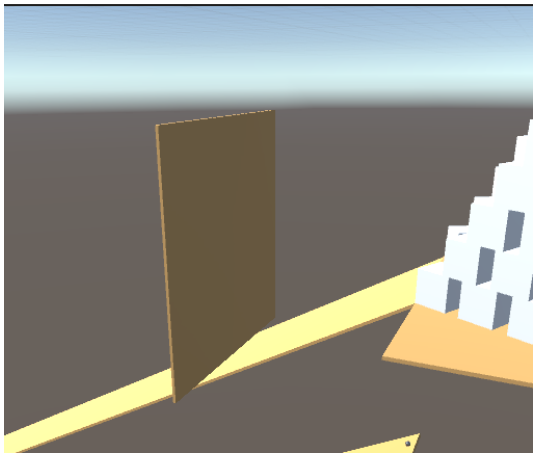


Figure 13

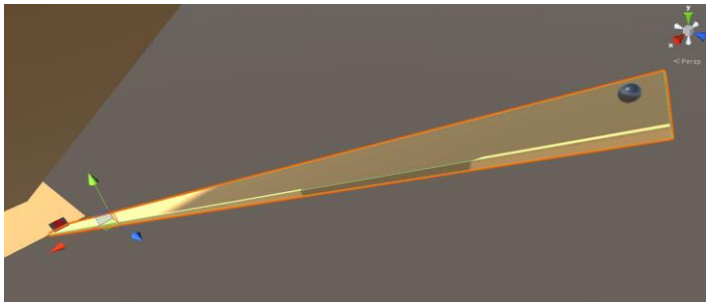


Figure 14

When the big ball is released by the door it fall forward to the spinning hammer, I put the velocity and force up to 10000 just to see what happened and it flew across the sky, all the way back. So I thought I should have this land in a basketball hoop but unfortunately the physics and timing with this device is not very consistent, so I opted into having it roll into a goal instead. And that is the end of the machines run. (Figure 15).

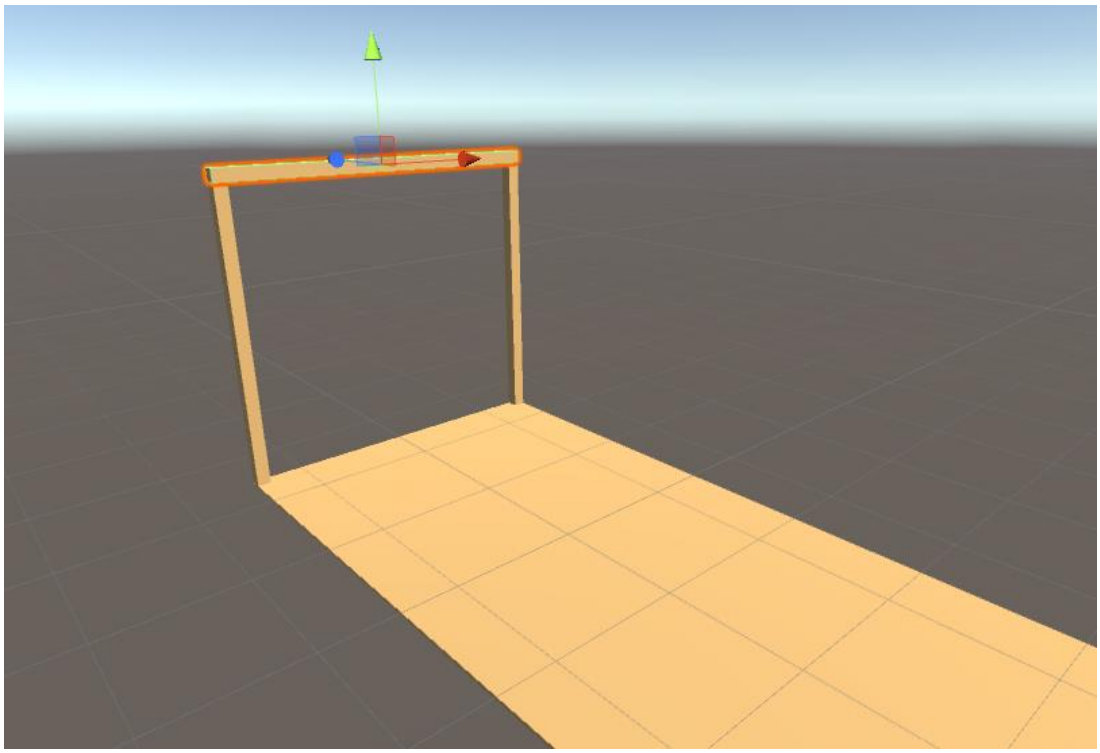


Figure 15

Camera tutorial

https://www.youtube.com/watch?v=MFQhpwc6cKE

Brackeys, june 28, 2017.

Lighting tutorial

https://www.youtube.com/watch?v=wwm98VdzD8s

Brakeys, February 21, 2018.

Restart Script

https://gist.github.com/NovaSurfer/e96f3777ca7a4c46f391634ec65dc695

NovaSurfer, No date provided.

Texture Maps

Leather_001

https://meocloud.pt/link/1310c787-6256-4568-815b-74f2ae732ccb/Leather_001/

Gold_Nugget_SD

https://meocloud.pt/link/e7279837-69a0-4897-abf1-0480eecb621f/Gold_Nugget_001_SD/

Stylized_Bark_001_SD

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Wood_004_SD

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Gun_Metal_Scratched_001_SD

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