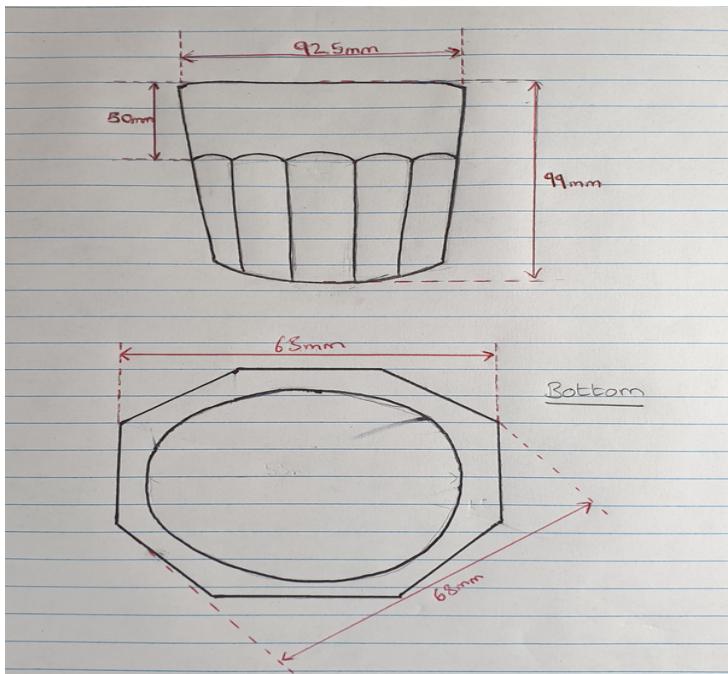


COSC 342 Assignment 1 Report - Dan Skaf - ID 7138265

Glass Cup

I started with a drawing of the cup after taking dimensions as accurately as I could with a 30cm ruler.

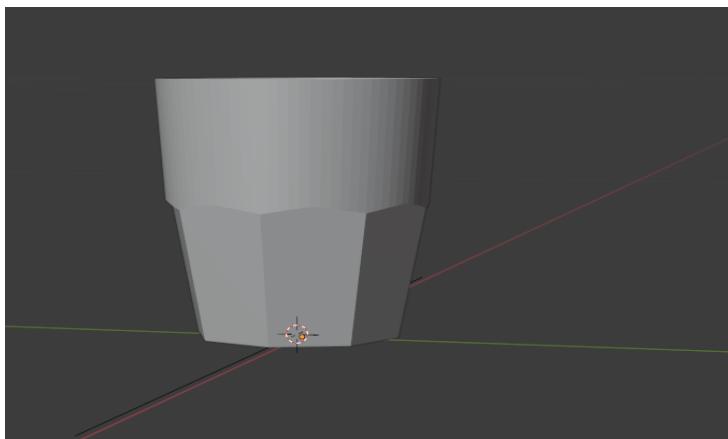


I made an octagonal base and extruded it to the height of the cup and set its diameter equal to the base of the cup.

I wanted to keep the model as one piece. I added a loop cut half way up the cylinder and subdivided the top cylinder to have enough vertices to use the To-Sphere tool.

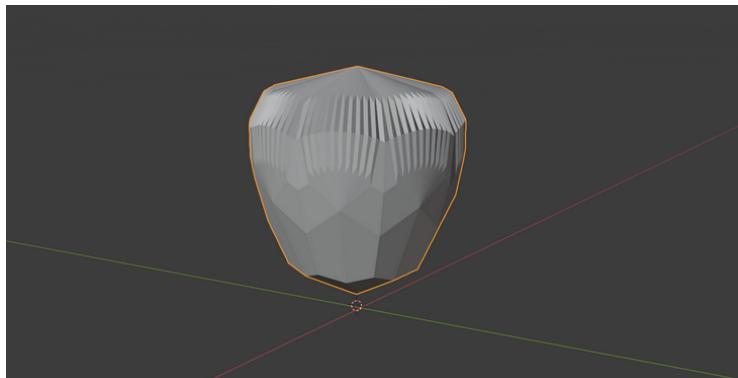
This gave a circular smooth top and left the octagonal base. Once I had the circular top I could scale it to the top rim of the cup and slide the length of the middle ring to dimension.

Taking a dimension of the middle circumference was difficult so I just eyeballed it until the glass had a linear taper. I deleted all but 2 segments and used the mirror tool on x and y axis then detailed the arches using the sphere proportional editing tool.



The solidify modifier made the creation of the interior very simple. I just had to set the thickness of the glass to 3mm.

Once I had the basic shape of the glass completed I intended to use the subdivision surface to smooth the cup however it led to some unexpected behaviour.



I opted instead to use smooth shading, this caused some shading issues that I had to manually fix by adding loop cuts, insetting faces and adding more vertices closer to the edges I wanted to keep straight.

Subdivision surface modifier effects

The final detailing of the cup came down to insetting the base with a circular brim. The inside of the cup needed to be raised slightly and also concaved. I deleted the face and used a grid fill then again used proportional editing to raise the face and concave it. The base of the cup proved to be the most difficult and gave weird clipping issues. I am still not quite happy with the base. I believe my method of using the solidify modifier caused this. If i had more time I would take a different approach to ensure the inside of the glass was a closer image to the outside.

Materials and Scene.

I followed a tutorial¹ to set the material of the glass and add liquid to it. The glass material is a Principled BSF with index of refraction set to 1.450 the transmission set 1 and roughness turned right down.

The liquid is also a Principled BSF material with volume absorption set to a density of 500 giving it a dark appearance of coffee or tea. It has a stretched edge to mimic surface tension and slightly clips into the inner of the glass to look like the liquid is hugging to the inner of the cup.

The scene is a sort of lounge with warm and low lighting . I based it on the HDRI² I chose which I got from a website licenced under the creative commons CC0. The table is just a plane with a wood material³ and normal maps and the notebook is also a rectangle with some insetting, edge cuts, a leather material⁴ and a normal map. The ribbon is a fabric normal⁵ map with a red colored Principled BSF. The teapot has a paint texture.⁶

¹ Blender Guru Youtube :
<https://www.youtube.com/watch?v=SBtDix7xGOg&list=PLjEaoINr3zgEq0u2MzVgAaHEBt--xLB6U&index=15>

² HDRI Haven: <https://hdrihaven.com/hdri/?c=indoor&h=fireplace>

³ CC0 materials: <https://cc0textures.com/view?id=Wood028>

⁴ <https://cc0textures.com/view?id=Leather014>

⁵ <https://cc0textures.com/view?id=Fabric026>

⁶ <https://cc0textures.com/view?id=Paint004>

I used two spotlights to accentuate the lighting from the HDRI as much as possible. I was really happy with the final reflection on the table and interactions with the light glass and liquid. Set some depth of field to the camera which adds a more realistic look in my opinion.

As stated before overall I am happy with the result but would have liked more time to try different approaches to the inside of the cup and not have to rely as much on the liquid of the glass and experiment more with lighting.

