COL781 A2 Report

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1 Introduction

These are the results for the A2 : Mesh processing that we obtained
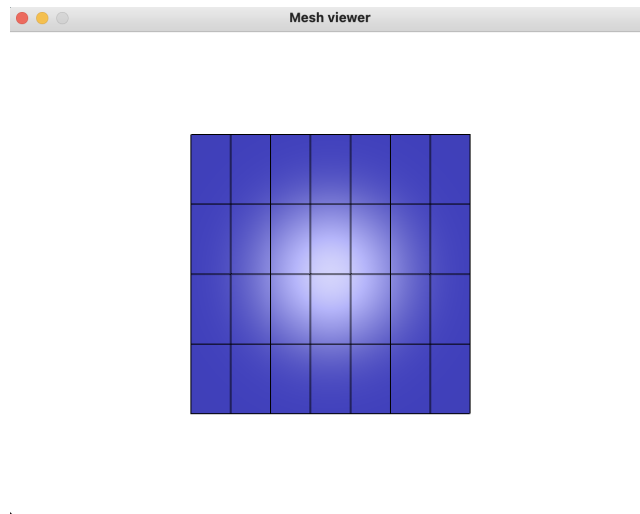
2 Simple Meshes

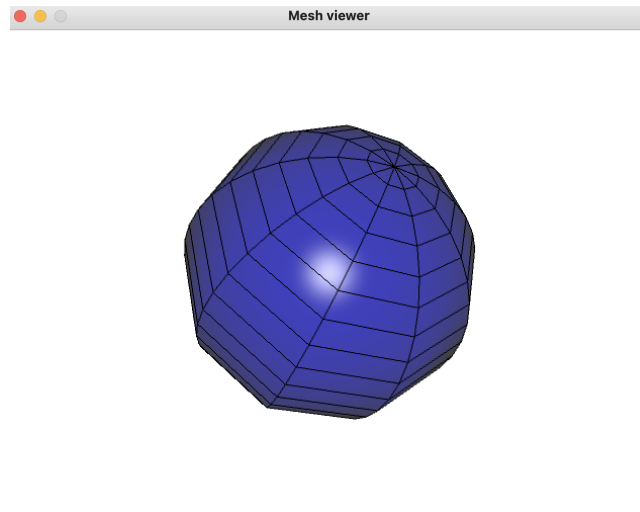### 2.1 Plane Mesh

Figure 1: Plane Mesh
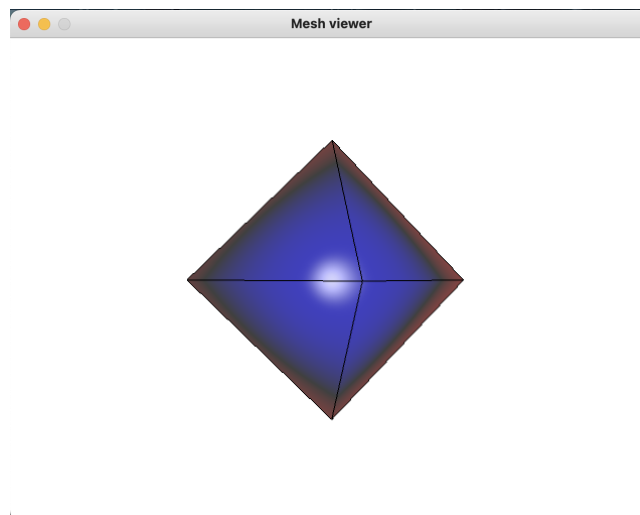
2.2   Sphere Mesh

Figure 2: Sphere Mesh

Figure 3: Sphere Mesh 4x2

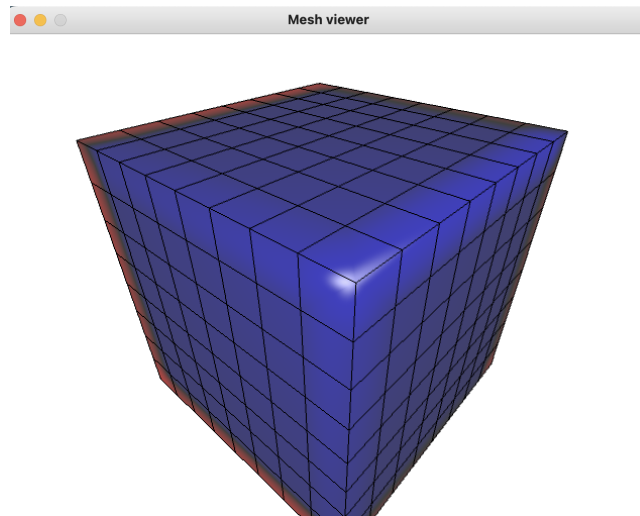## 2.3   Cube Mesh

Figure 4: Cube Mesh

3   OBJ Meshes

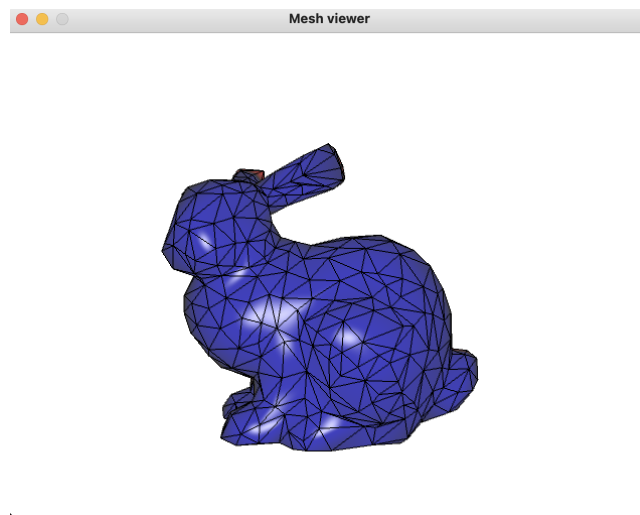## 3.1   Bunny OBJ Mesh

Figure 5: Bunny OBJ Mesh
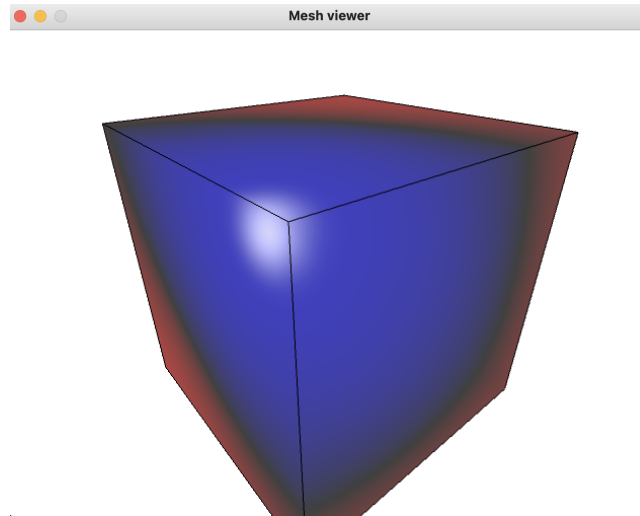
3.2   Cube OBJ Mesh

Figure 6: Cube OBJ Mesh
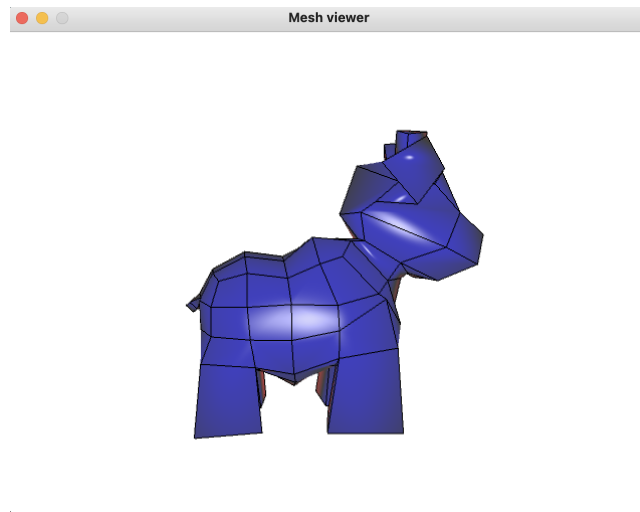
3.3   Spot Model OBJ Mesh

Figure 7: Spot Model OBJ Mesh

4 Laplacian Smoothing on Noisy Cube

4.1 Noisy Cube Before Smoothing
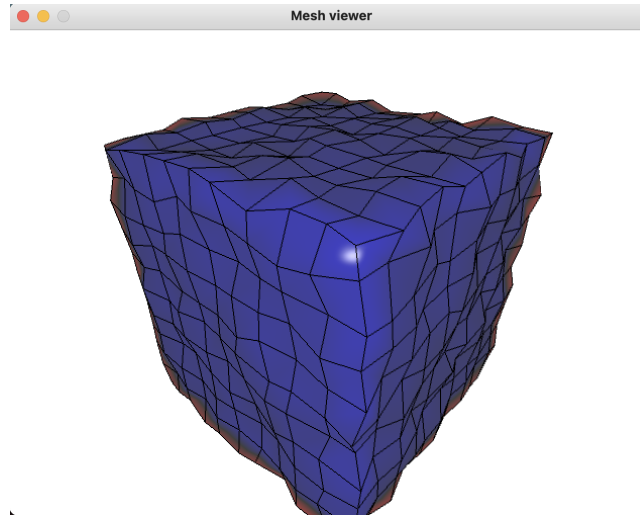

Figure 8: Noisy Cube Before Smoothing

4.2 Noisy Cube after smoothing for 10 iterations

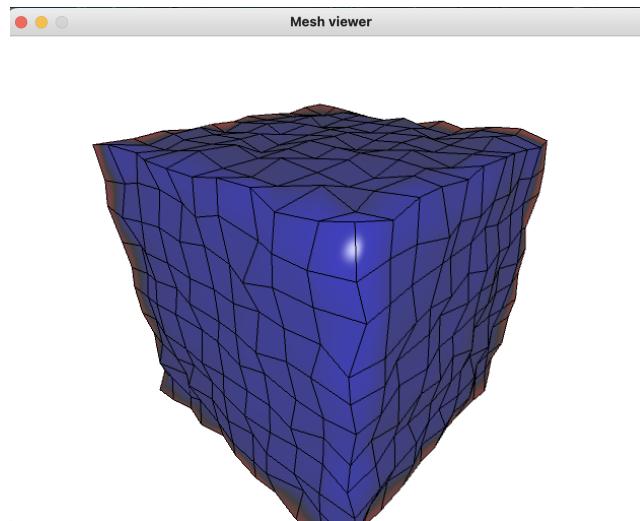Figure 9: Noisy Cube after smoothing for 10 iterations
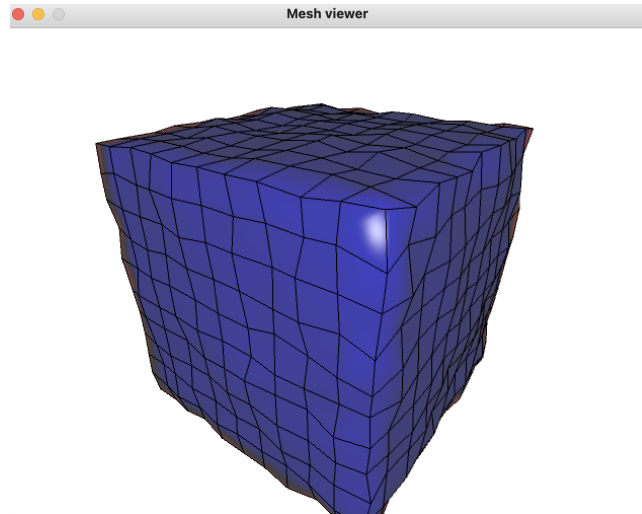
4.3 Noisy Cube after smoothing for 50 iterations

Figure 10: Noisy Cube Before Smoothing

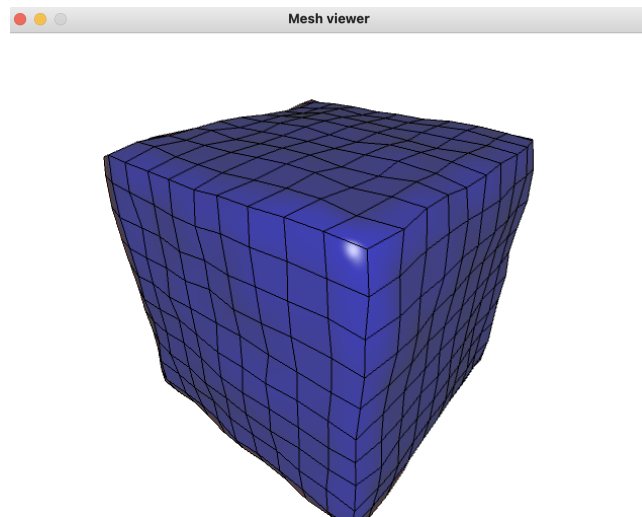## 4.4 Noisy Cube after smoothing for 100 iterations

Figure 11: Noisy Cube after smoothing for 100 iterations

5 Extrusion Operation

5.1 Cube Extrusion

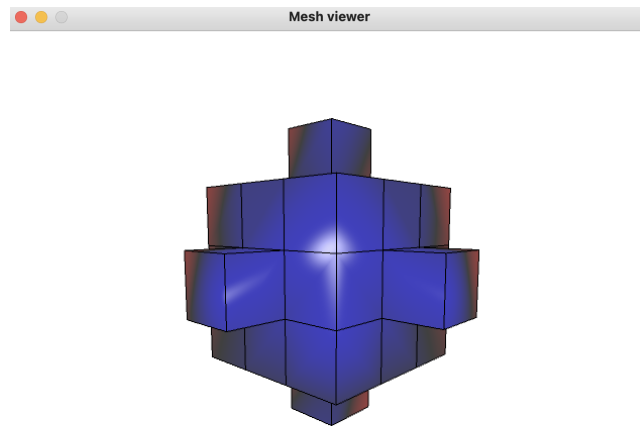We extruded all the face centres of a 3x3 cube.

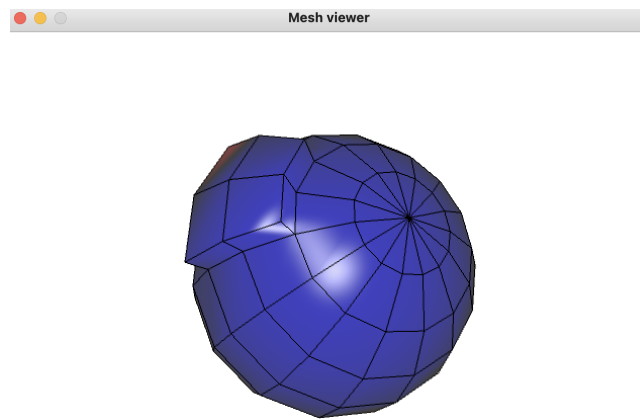Figure 12: Cube Extrusion

5.2 Sphere Region Extrusion

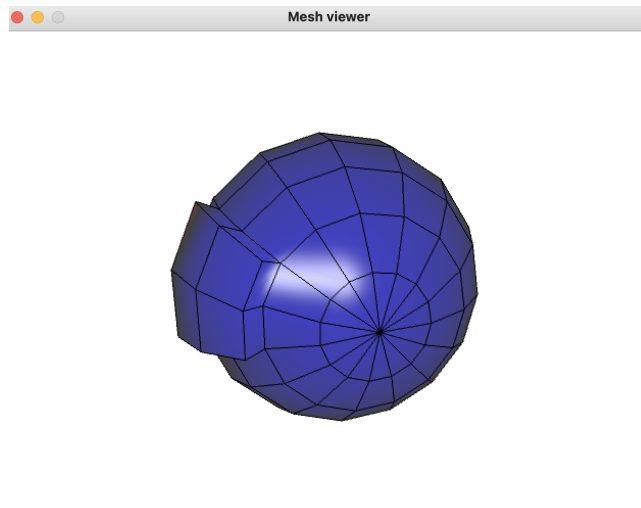Figure 13: Sphere Region Extrusion - View 1

Figure 14: Sphere Region Extrusion - View 2

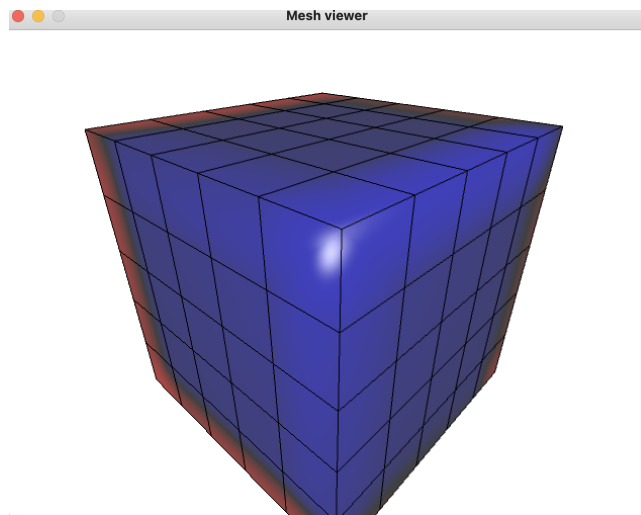# 6 Catmull-Clark Subdivision

6.1 Cube 1 Subdivision

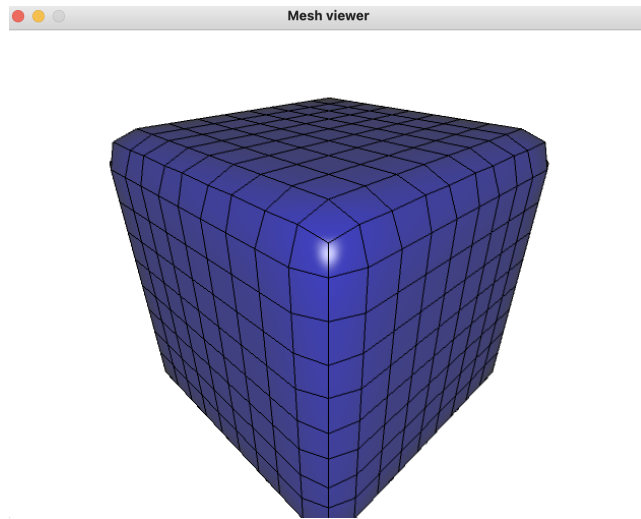Figure 15: Cube 1 - Catmull-Clark Subdivision (Iteration 1)

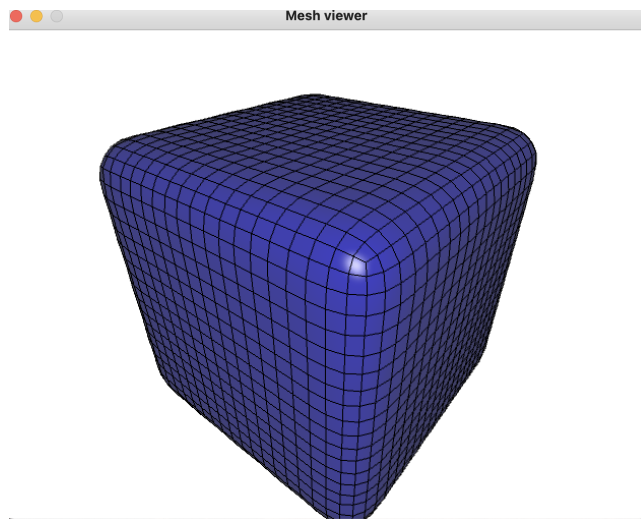Figure 16: Cube 1 - Catmull-Clark Subdivision (Iteration 2)

Figure 17: Cube 1 - Catmull-Clark Subdivision (Iteration 3)
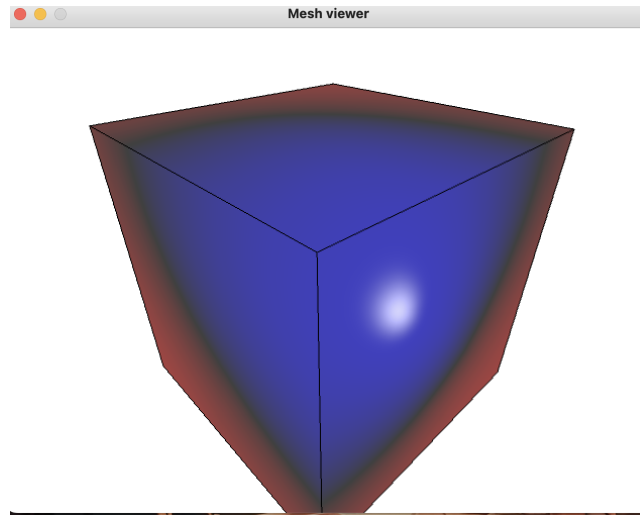
6.2 Cube 2 Subdivision

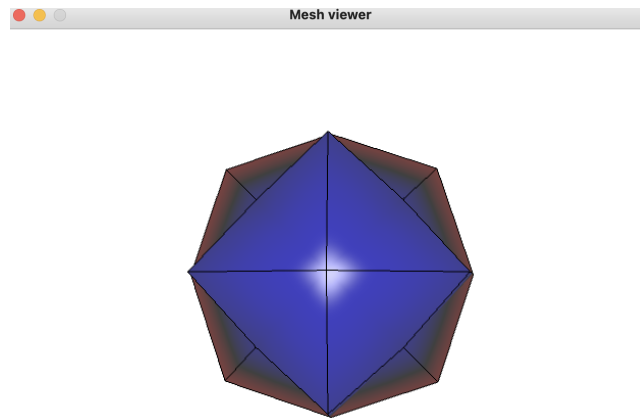Figure 18: Cube 2 - Catmull-Clark Subdivision (Iteration 1)

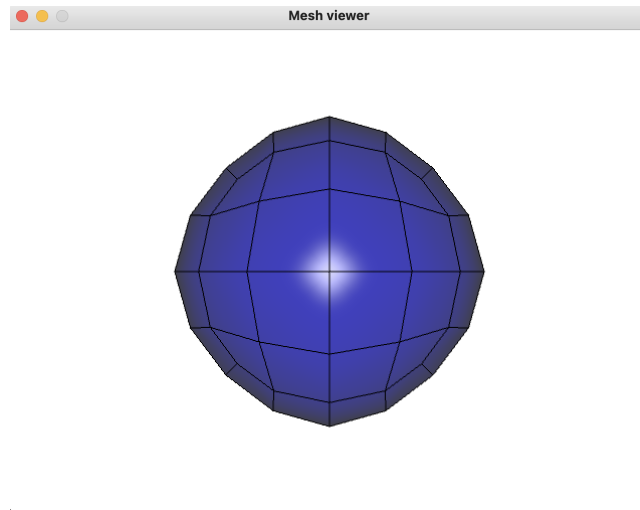Figure 19: Cube 2 - Catmull-Clark Subdivision (Iteration 2)

Figure 20: Cube 2 - Catmull-Clark Subdivision (Iteration 3)
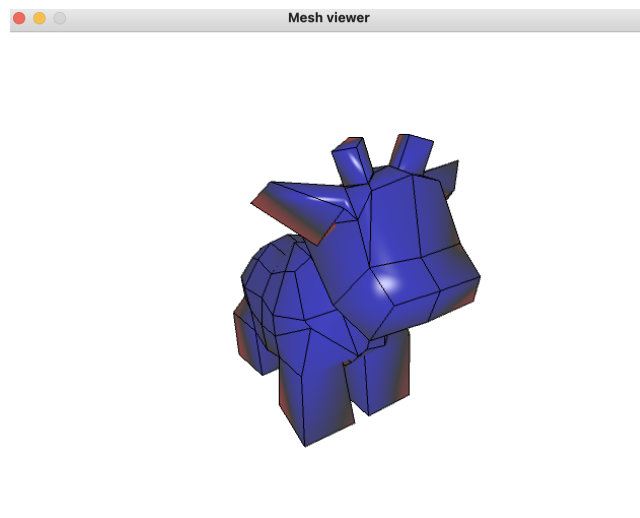
6.3 Spot Model Subdivision

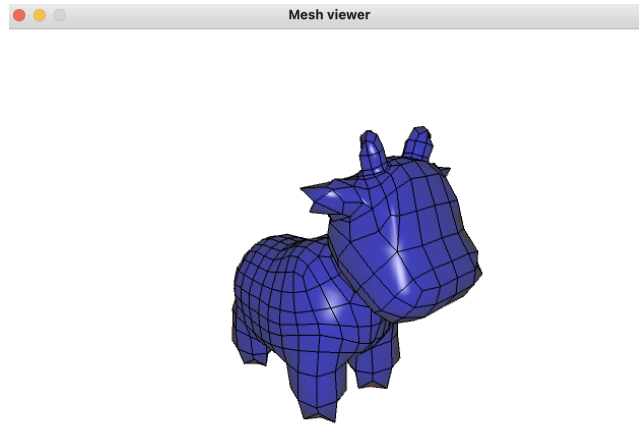Figure 21: Spot Model - Catmull-Clark Subdivision (Iteration 1)

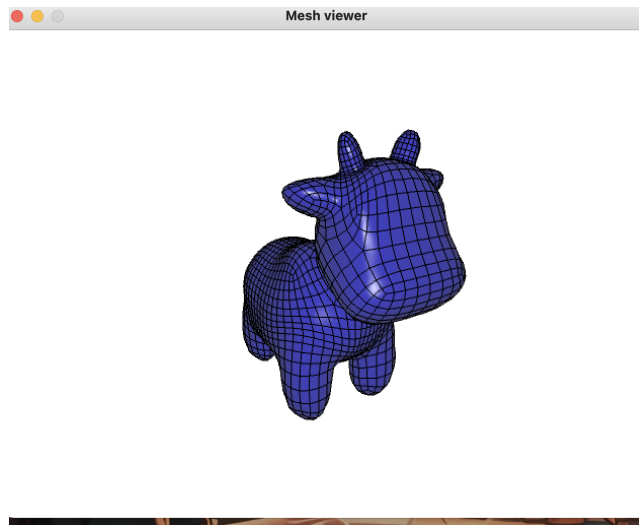Figure 22: Spot Model - Catmull-Clark Subdivision (Iteration 2)

Figure 23: Spot Model - Catmull-Clark Subdivision (Iteration 3)

7   Custom Mesh

We decided to make a vase. we did so by constructing a parametric function for the radius based on height. We used the cosine function for the bulge and sine function for the cut near the opening and smoothening was done using square function and exp function.

After this construction of parametric curve, we rotated the curve to generate this vase. Then we added a top and bottom face to close the mesh. After this we applied catmull-clark subdivision and umbrella operator to smoothen the mesh and remove any irregularities.
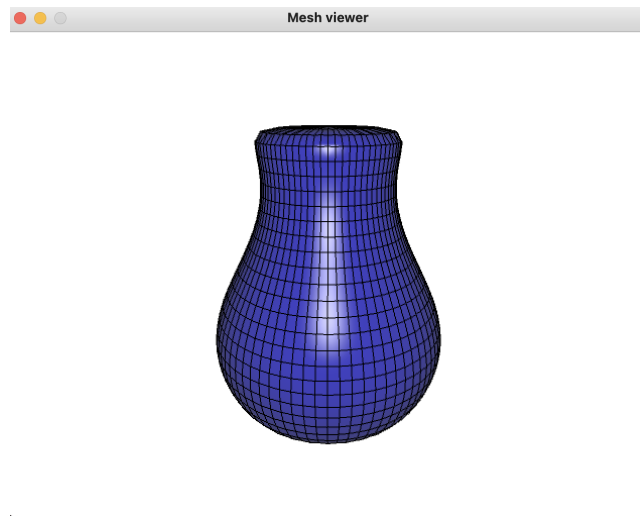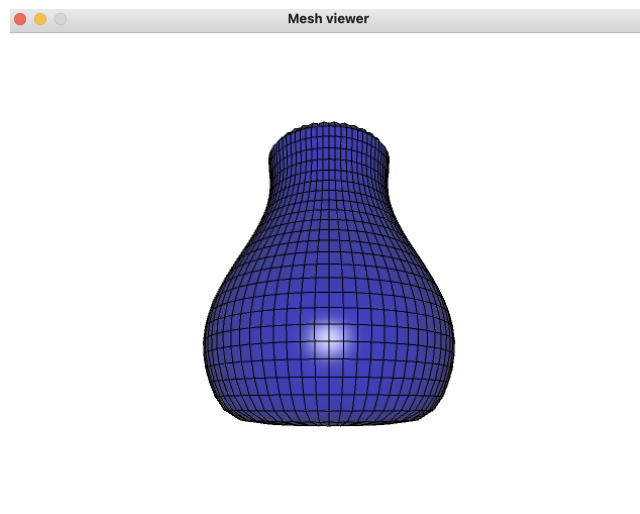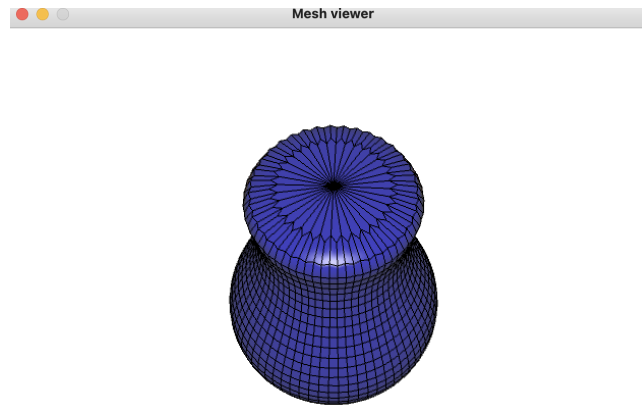

Figure 24: Custom Mesh - View 1

Figure 25: Custom Mesh - View 2

Figure 26: Custom Mesh - View 3