**Brandon Hobbs**

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**CS-330**

**Module 1: Project Review**

In anticipation of the final project and being able to break down real-world items into shapes a GPU can render:

* Cube
* Cylinder
* Plane
* Pyramid
* Sphere
* Torus

As practice this 2D picture was selected and its decomposition follows.



In the image of a simple desktop scene there are a few simple and a few challenging shapes. To begin, the simple shapes are decomposed first.

**Simple shapes:**

The pen, pencils, and pen cap would all be represented by cylinders.

The pinecone could be a pyramid but might look strange and unrecognizable unless a realistic texture was applied.

The paper pad could be a plane but would be better as a cube so the wire spiral might be represented as a cylinder.

The coffee cup, at least with this camera perspective, could be a cylinder and its handle a torus.

**Complex shapes:**

How could one represent the glasses with the shapes at our disposal? The frames would have to be a combination of many cylinders (earpiece) and cubes. The frame around the lens could be handled as a series of 4, interconnected cubes or cylinders, but this would be very blocky and angular. Instead, it might be better to use a single cube with a texture that has some transparency.

The keyboard could also be treated in a similar manner. Each key could be a cube as well as the main body of the keyboard, or a highly detailed texture could be employed. Or even a textured plane. It would come down to what the purpose of the keyboard was. For example, is it interactive in a game where depth and function are needed or is it just a background image with no direct interaction?

The eucalyptus leaves are going to be difficult. If they are to be faithfully modelled, then the stem would be a cylinder or a few to account for the bends. The leaves would need to be toruses. It would probably be better to use an elongated pyramid with a highly detailed texture.

**Simplification:**

To simplify the 2D picture in a 3D space I would omit the eucalyptus leaves. The pinecone is questionable. If using textures in place of accurately modelled features is possible then both could stay.

The keyboard should also be flattened into a single cube for simplification purposes.