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Joshua Humphrey worked on modelling and texturing for the group as well as providing analysis on different topics.
Justin Lee is the team's main programmer, working on the basic function and lightning.
Jeffrey Lundy worked on adding shaders and lighting to the scene via blender.

Repository link: https://github.com/QueenLinlay/Intermediate-Computer-Graphics-Midterm-2022
Graphics Storyboard link: https://docs.google.com/presentation/d/1KJ67jqXRPsEYF5mKe0VkcMNrlgWO-9nvtk1Y6fUDMG8/edit?usp=sharing

The game that we have chosen is Donky Kong the arcade version where the player must avoid the barrels to make it to the endpoint. The main character is a slime by the name of Tony who is on an adventure to cross Wobbly road. In his journey, he is stopped by an evil barrel that is blocking his path forward. To win you must guide Tony past the barrel to the other side of the road but watch out if you get hit by the barrel Tony will get squashed causing a game over where you will have to restart.

The number we got was **Even** (100733209,100658626,100745949,=24)

1. Select the playable character and use it to explain the graphics pipeline stages associated with the Vertex shader, Geometry Shader, and fragment shader.

In terms of our playable character, we must follow the graphics pipeline to see the character appear properly in the game. The first of the stages would be the vertex shader as this helps to set up where the vertices can be seen in space. At this point, we will know the vertex locations in space so it will next be sent to the geometry shader which governs the primitives and allows for multiple instances of the same input primitive to build the shape of our main character. After this moves to the fragment shader, our main character finally gets his texture set so that we can visually see our full main character.

2. Explain how the Phong lighting model allows you to create a metallic feel for objects within the game.

The Phong Lighting Model uses the specular to allow reflection light to create a metallic feeling by giving the effect of light being reflected. This is done by using the dot product which is continually recalculated based on the view, and the light source reflected on the surface. In addition with the diffuse light which colours an object based on where the light is pointing and ambiance which fills the shaded parts, when combined with specular lights, it gives the effect that the object is not only shiny as a result of the diffuse and ambiance but reflecting some of the light with the specular effect.

3. Explain what approach allows you to create a winter feel using shaders.

When creating a winter feel using shaders, one of the effects we could implement would be having the snow reflect the ambient light of the scene similar to how snow is bright and reflects light in real life. We could also add a shader that covers objects in cool winter colours, such as grays and blues as there are usually overcast skies during the winter.

4. A dynamic light that gives the effect of changing the scene (e.g., day passing, seasonal changes, etc.). This includes proper light behaviour when moving away or closer to objects.

This can be seen as a part of our video discussion as well as in our graphics storyboard.

5. Explain how you implemented the shader of this Midterm and indicate why this choice was made.

As we are doing the shader as a part of the art portion we focused on utilizing the shaders that can be found within blender. As stated within the storyboard we used shader nodes to combine a toon shader which acts as our art style, and a velvet shader which gives our slime a softer look. Together this gives our main slime character an interesting jelly-like look. For the barrel, we added the toon shader to fit our art style and mixed it with a rough diffuse shader to give a barrel a rugged look. We found that this was important to the feel of the game as it is more cartoony and we didn’t want our slime character to look rigid.