1. Describe the difference between the Gouraud shading and Phong shading models. Include screen shots from your application (or pictures from lector or online) to help strengthen your discussion.
   1. The first big difference between the Gouraud shading and Phong shading models is where the actual calculations that provides the shading comes from. In the Gouraud shading the calculations happen in the vertex. The vertex shader determines a color for each vertex and then pass that information to the fragment shader. This type of shading is also referred to as smooth shading because it is interpolated across the fragments. The Phong shading methods happens in the fragment shader. The vertex shader provides the normal and position data to the fragment shader. The fragment shader takes this information and computes the color. More specifically the Gouraud shading calculations computes the normal for each vertex, calculates lighting equation at each vertex in the polygon to define the color, and then interpolates colors to shade the inside of the polygon. The Phong shading calculates the normal at each vertex of a polygon, interpolates the normal vectors for each point inside the polygon, and the applies the lighting equation to each pixel.
   2. A picture containing text, pool ball, pool table, table

      Description automatically generated
      1. The Gouraud model gives a smoother picture while the Phong model gives a more realistic model.
   3. A picture containing pool ball, pool table, sport, table

      Description automatically generated
      1. The Gouraud method gives more of a generalized area a blurry reflection while the Phong methods gives more of a centered reflection point with more defined shadows.
   4. A picture containing text, pool ball, sport, table

      Description automatically generated
      1. The Phong method is a more exact method it creates more of a point while the Gouraud method create a generalized area that is reflective.
2. The Phong reflection model includes several non-physical (non-realistic) components in the model. List and describe these components that are not realistic and describe why they are made.
   1. Diffuse: This is the color that is shown when the object is under pure white light.
   2. Ambient: The ambient colors is the color that needs to be calculated when a color is illuminated by ambient light and not direct light.
   3. Specular: Specular color is the color of the light of a specular reflection or the type of reflection that comes off of shiny surfaces.
   4. Emissive: The color that comes from self-illumination