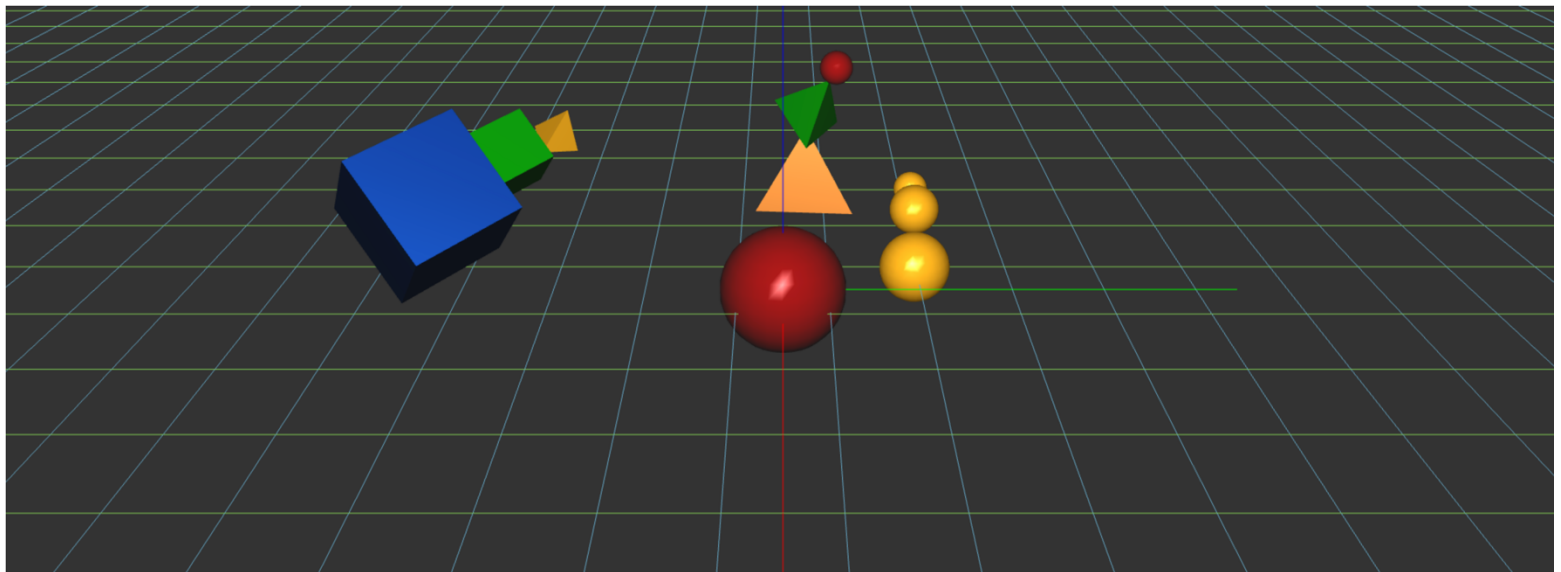Project C: Lighting magic

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This project C: Lighting magic demonstrate a few simple 3D assemblies on a grid. They have been made by different materials which could let them react differently with the light source we set up. These assemblies are composed by multiple 3D jointed parts, and they are keep spinning, shifting, and rotating according to varied axes. All these settings directly help us to better observe the different lighting or shading effects on the objects. There are two shading (Gouraud Shading and Phong Shading) and two lighting methods (Phong Lighting and Blinn-Phong Lighting) which can be chosen by the users.

User Guide:

There are lots of interaction functionalities supported by this project. First, you can freely adjust the looking position by pressing the W A S D keys and move the camera by pressing the arrow keys. Moreover, the light source can also be turned on or off by pressing the P key and the "Change Shading" and "Change Lighting" buttons can be used to switching between different Shading and Lighting modes. The RGB values for the light source are also adjustable, you can use the sliders

under the viewport to try on different RGB values for ambient, diffuse and specular. The position of the light source can also be change using the slider and this could further helper the user to observer the lighting effect in different lighting position.
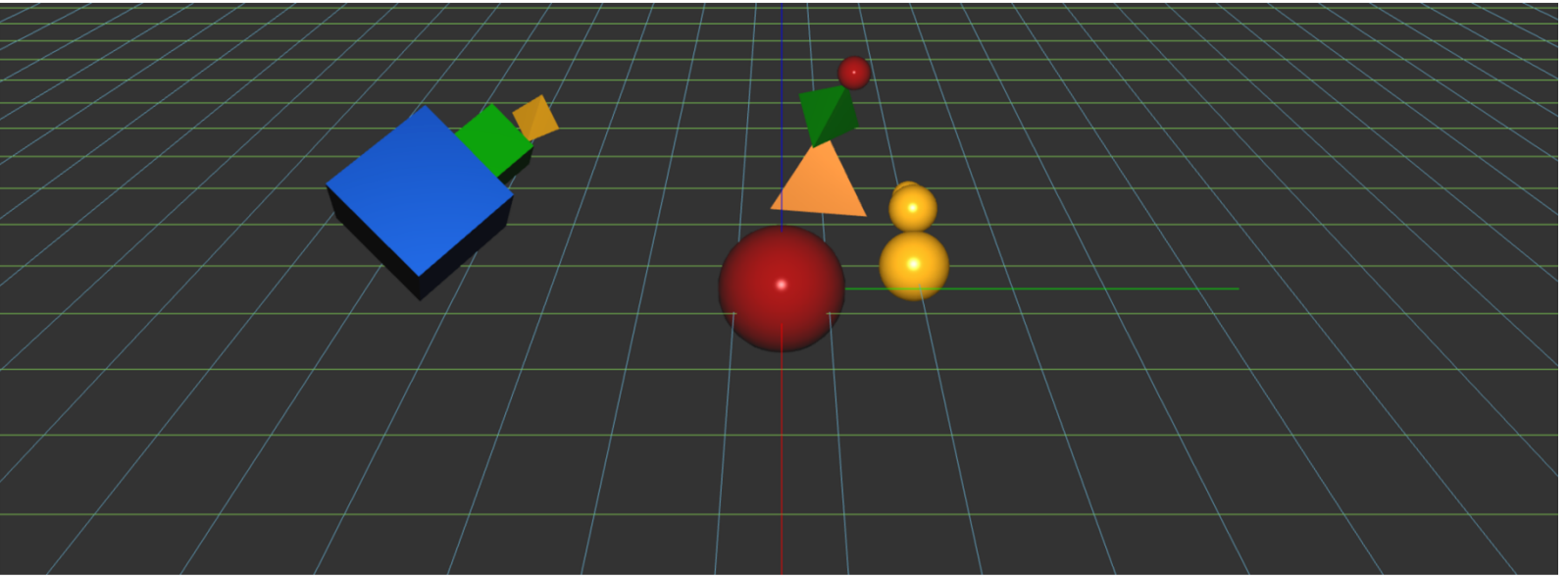
Result:

Change Shading | Change Lighting | Press P to turn on/off the light

Gouraud Shading and Phong Lighting

Press W A S D to change the looking position of the camera (The location of the camera would stay the same).

Press the arrow keys to freely move the camera in the space.

Default RGB values would be 1 and you can adjust them between 0 to 10. You can also drag the position of the light source.

ambient R   ambient G   ambient B
diffuse R   diffuse G   diffuse B
specular R   specular G   specular B
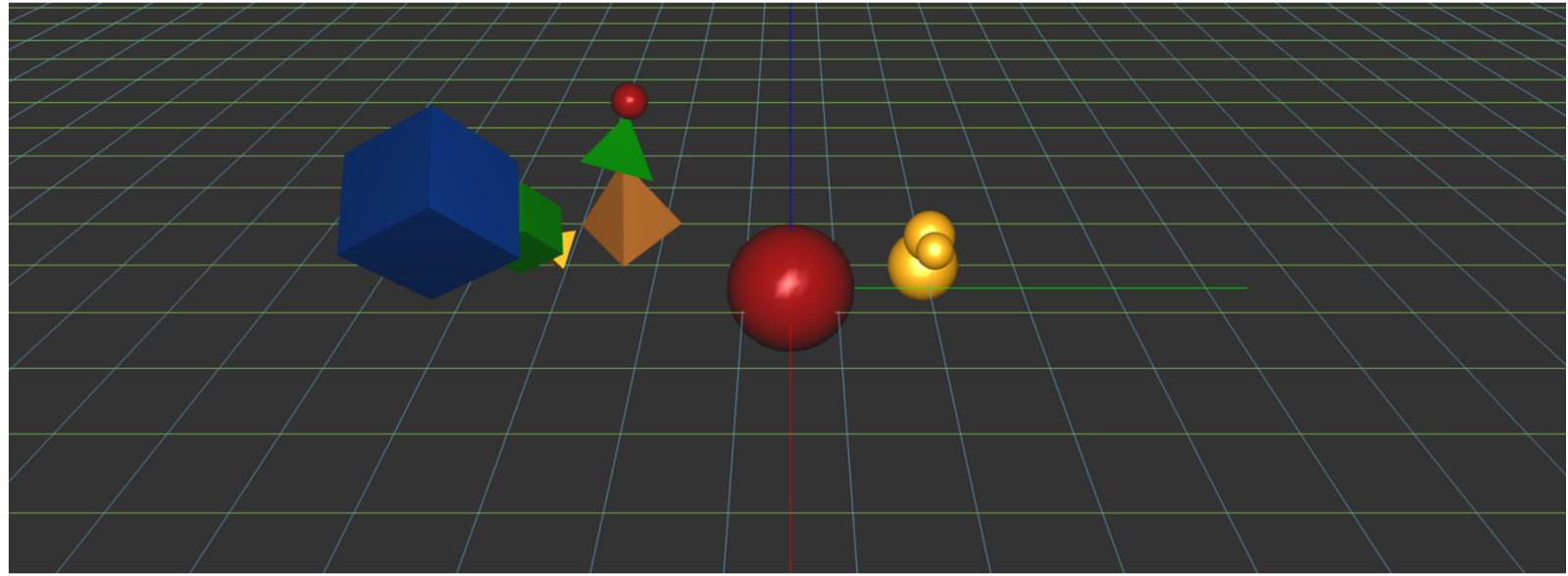Light position X   Light position Y   Light position Z

Change Shading | Change Lighting | **Press P to turn on/off the light**

Phong Shading and Phong Lighting

Press W A S D to change the looking position of the camera (The location of the camera would stay the same).

Press the arrow keys to freely move the camera in the space.

Default RGB values would be 1 and you can adjust them between 0 to 10. You can also drag the position of the light source.

ambient R   ambient G   ambient B
diffuse R   diffuse G   diffuse B
specular R   specular G   specular B
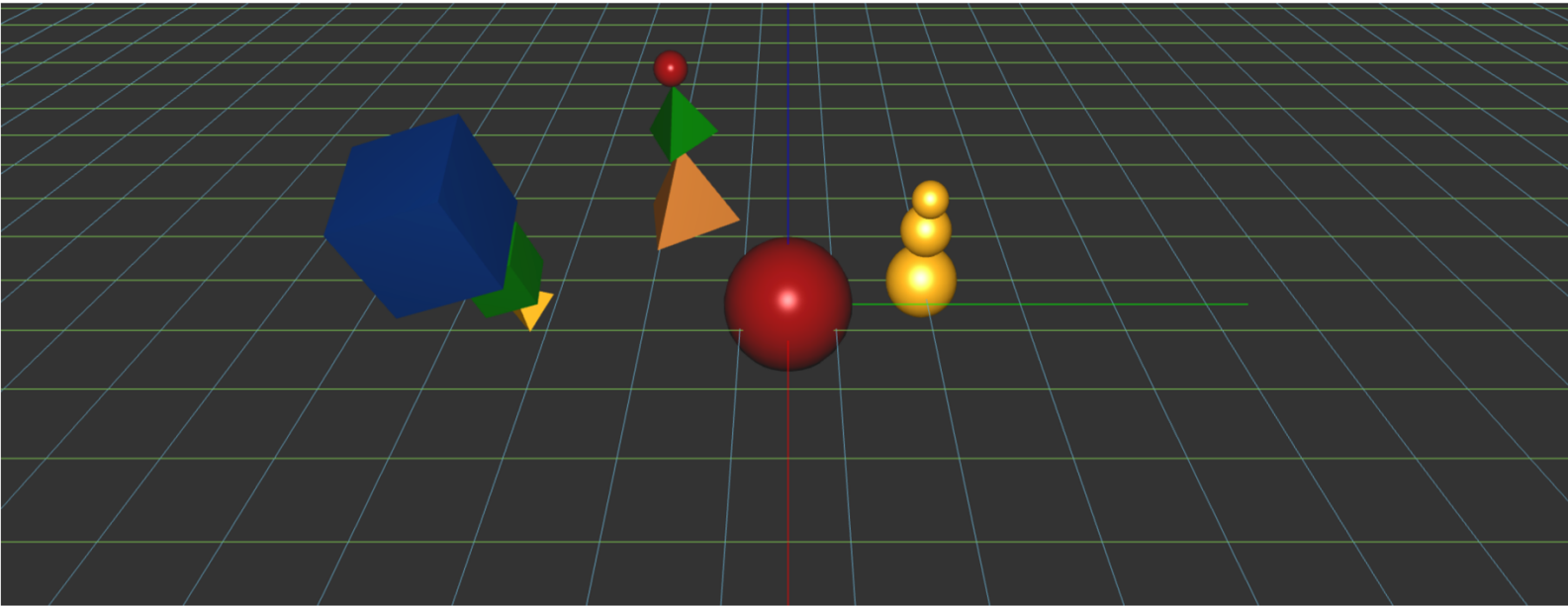Light position X   Light position Y   Light position Z

Change Shading | Change Lighting | **Press P to turn on/off the light**

Gouraud Shading and Blinn-Phong Lighting

Press W A S D to change the looking position of the camera (The location of the camera would stay the same).

Press the arrow keys to freely move the camera in the space.

Default RGB values would be 1 and you can adjust them between 0 to 10. You can also drag the position of the light source.

ambient R   ambient G   ambient B
diffuse R   diffuse G   diffuse B
specular R   specular G   specular B
Light position X   Light position Y   Light position Z

Change Shading | Change Lighting | **Press P to turn on/off the light**
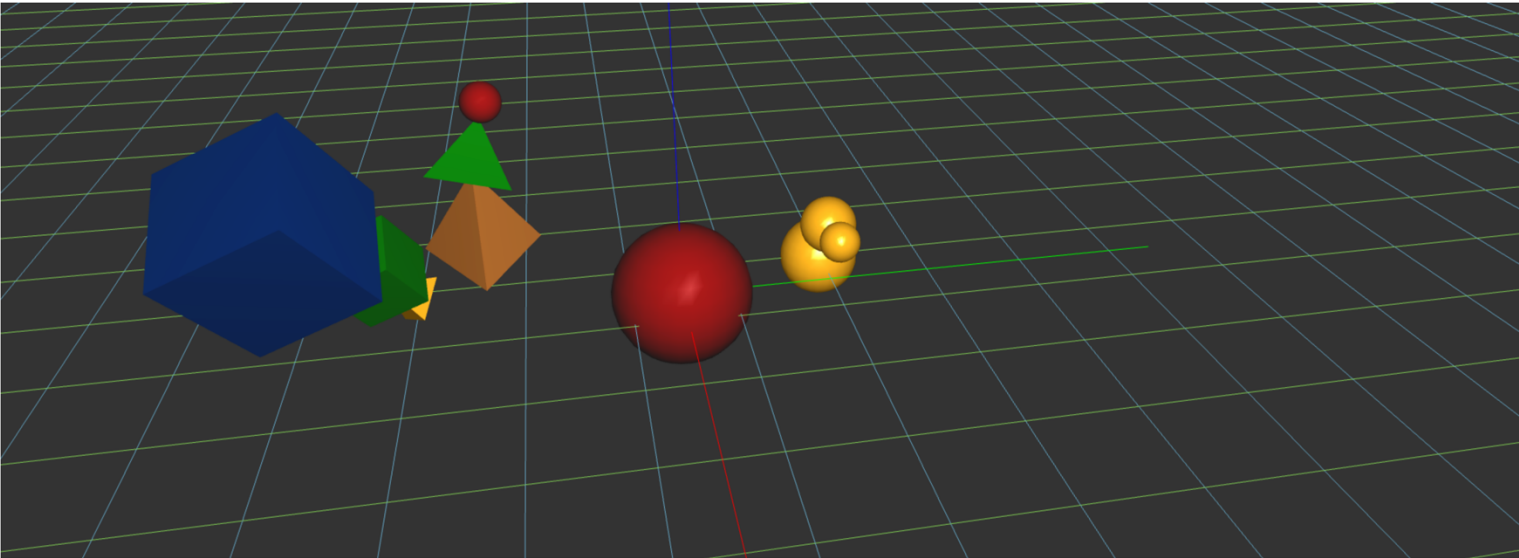
Phong Shading and Blinn-Phong Lighting

Press W A S D to change the looking position of the camera (The location of the camera would stay the same).

Press the arrow keys to freely move the camera in the space.

Default RGB values would be 1 and you can adjust them between 0 to 10. You can also drag the position of the light source.

ambient R   ambient G   ambient B
diffuse R   diffuse G   diffuse B
specular R   specular G   specular B
Light position X   Light position Y   Light position Z

F.1-4 This shows 4 combinations of the shading and lighting methods

Change Shading | Change Lighting | Press P to turn on/off the light
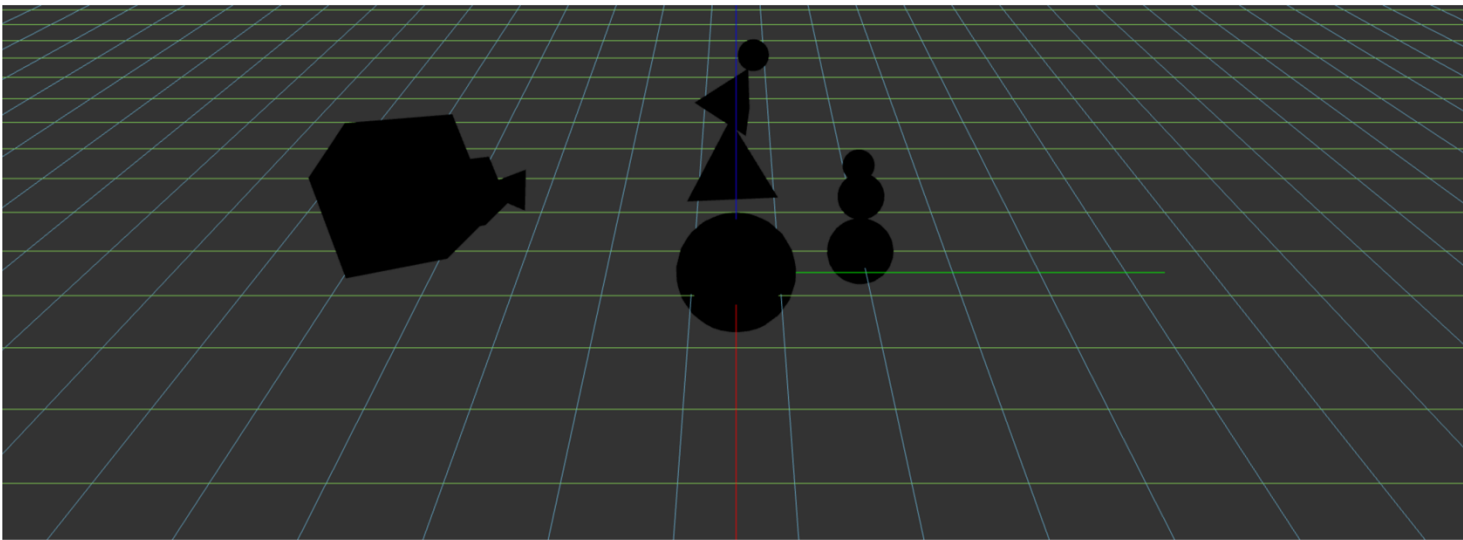
Gouraud Shading and Phong Lighting

Press W A S D to change the looking position of the camera (The location of the camera would stay the same).

Press the arrow keys to freely move the camera in the space.

Default RGB values would be 1 and you can adjust them between 0 to 10. You can also drag the position of the light source.

ambient R   ambient G   ambient B
diffuse R   diffuse G   diffuse B
specular R   specular G   specular B
Light position X   Light position Y   Light position Z

F.5 This shows scene when the camera look-at point and its position been changed

Change Shading | Change Lighting | Press P to turn on/off the light
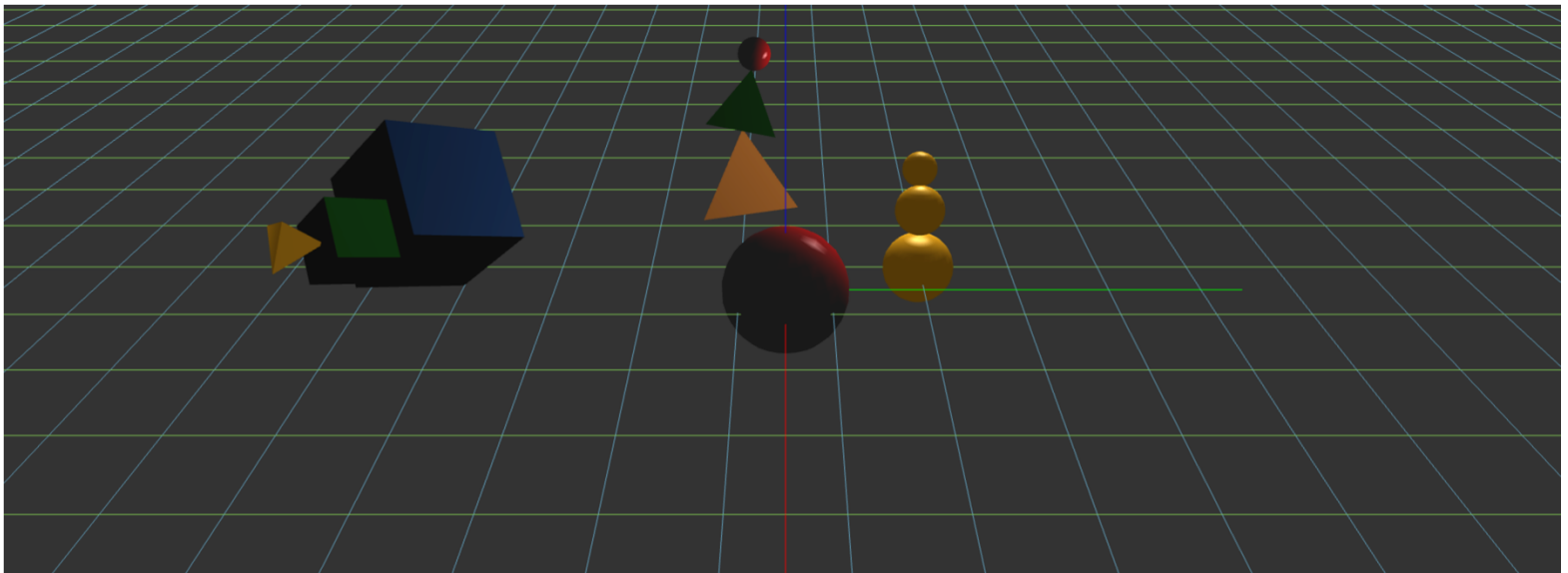
Gouraud Shading and Phong Lighting

Press W A S D to change the looking position of the camera (The location of the camera would stay the same).

Press the arrow keys to freely move the camera in the space.

Default RGB values would be 1 and you can adjust them between 0 to 10. You can also drag the position of the light source.

ambient R   ambient G   ambient B
diffuse R   diffuse G   diffuse B
specular R   specular G   specular B
Light position X   Light position Y   Light position Z

F.6 This shows the scene when the light been turned off

Change Shading | Change Lighting | **Press P to turn on/off the light**

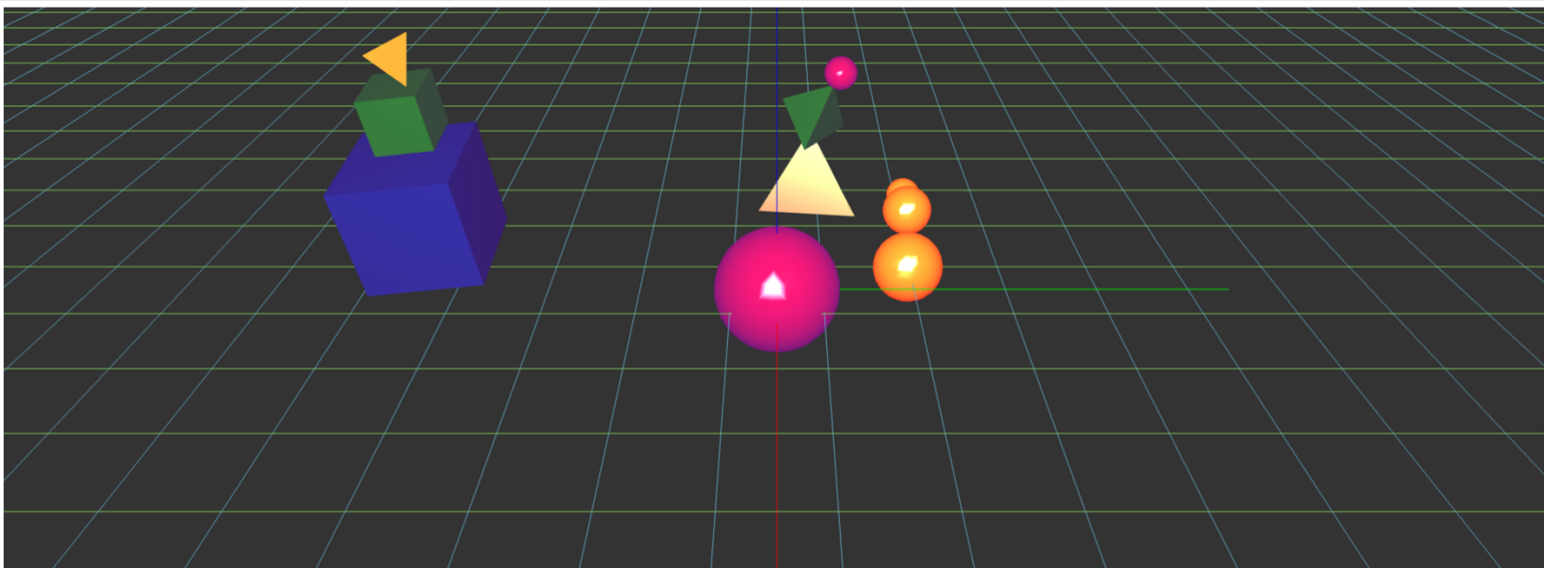**Gouraud Shading and Phong Lighting**

Press W A S D to change the looking position of the camera (The location of the camera would stay the same).

Press the arrow keys to freely move the camera in the space.

Default RGB values would be 1 and you can adjust them between 0 to 10. You can also drag the position of the light source.

ambient R   ambient G   ambient B
diffuse R   diffuse G   diffuse B
specular R   specular G   specular B
Light position X   Light position Y   Light position Z

F.7 This shows the scene when the light position been change

Change Shading | Change Lighting | **Press P to turn on/off the light**

Gouraud Shading and Phong Lighting

Press W A S D to change the looking position of the camera (The location of the camera would stay the same).

Press the arrow keys to freely move the camera in the space.

Default RGB values would be 1 and you can adjust them between 0 to 10. You can also drag the position of the light source.

ambient R   ambient G   ambient B
diffuse R   diffuse G   diffuse B
specular R   specular G   specular B
Light position X   Light position Y   Light position Z

F.8 This shows the scene when the light RGB values been changed

Scene Graph: