

## Project C: Robot with different shading and lighting

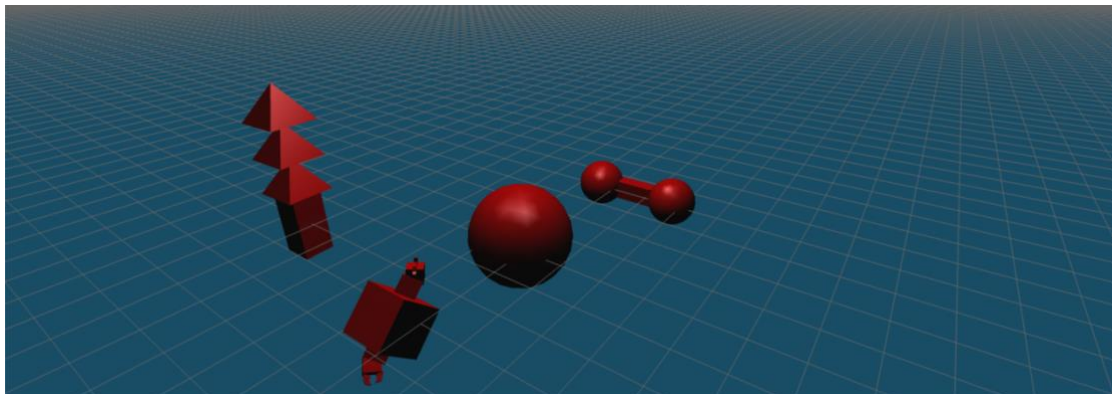
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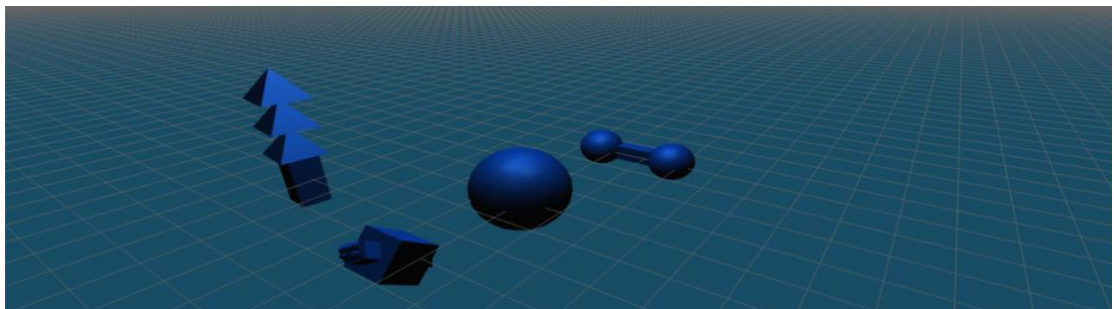
User's Guide: There are four objects in this project. You can select the materials of there objects like 'Red plastic', 'Green plastic', 'Bule plastic' and something like that. There has a button called 'GroundGrid hide/show'. By clicking this button, you can show the ground grid or hide it. There are two different shadings, Gouraud shading and Phong shading, each shading has two different lightings, Phong lighting and Blinn-Phong lighting. There are two buttons to control them. You also have a selection of lighting. You can turn it on or turn it off. The four keys 'WASD' can control the aim of the camera without moving it. You can use key W to enlarge the 3D shapes which means that you can see the details of the 3D shapes and use key S to make the shapes looks like shrink. Key A and Key D rotate view to the left and right. Arrow keys move the camera without rotating it. You can see the shapes trough different directions. Up and down keys move the camera forwards and backwards. Left and right keys move the camera left and right at current altitude. What's more, you can change the value of shininess, the position of lighting, Ambient, Diffuse, and Specular. When you wanna reset them, just click the reset button.

Results:

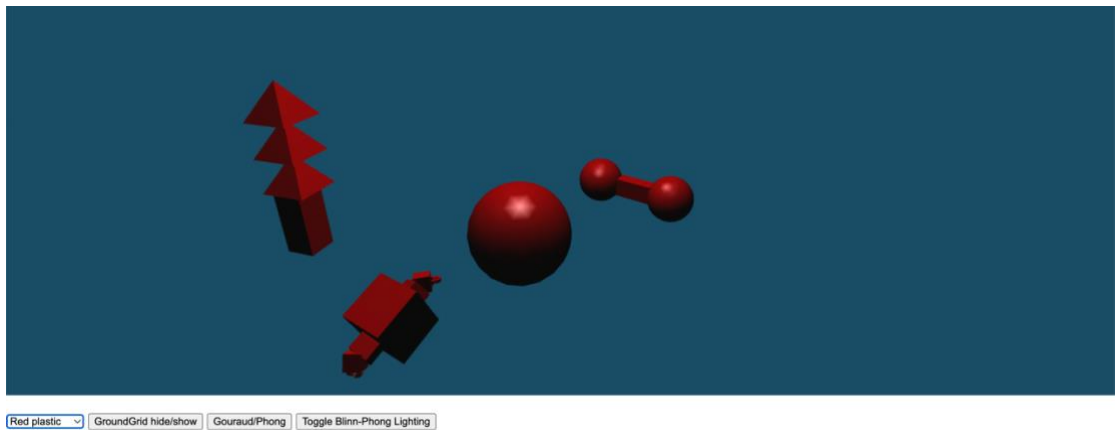
(1) The original canvas:



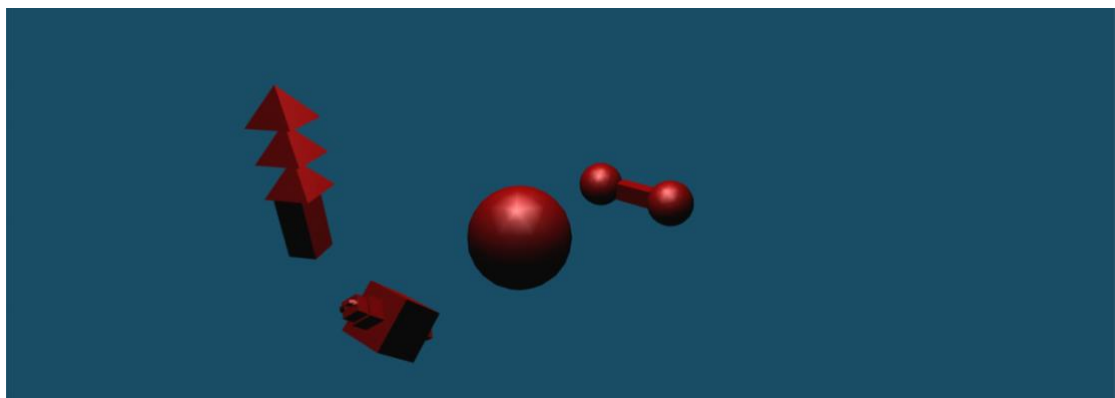
(2) After changing the materials



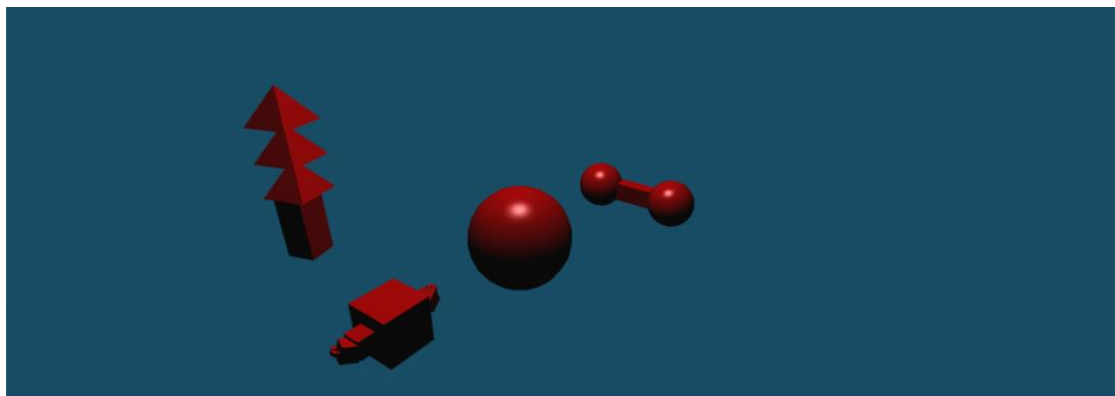
(3) Hide the Ground grid.



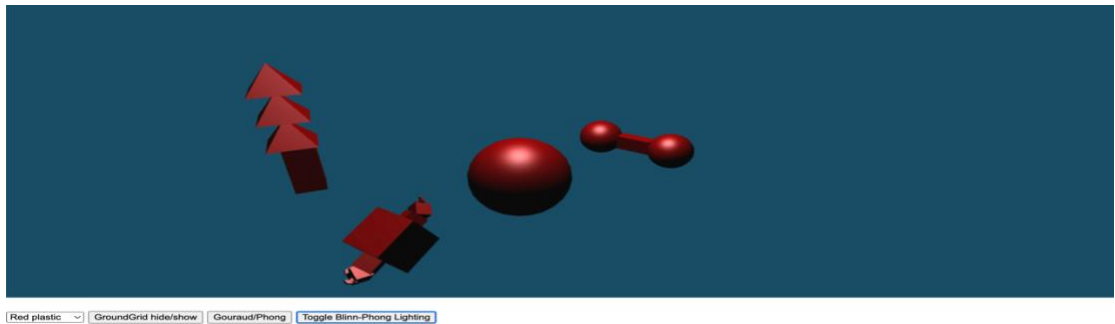
(4) Gouraud shading with another lighting



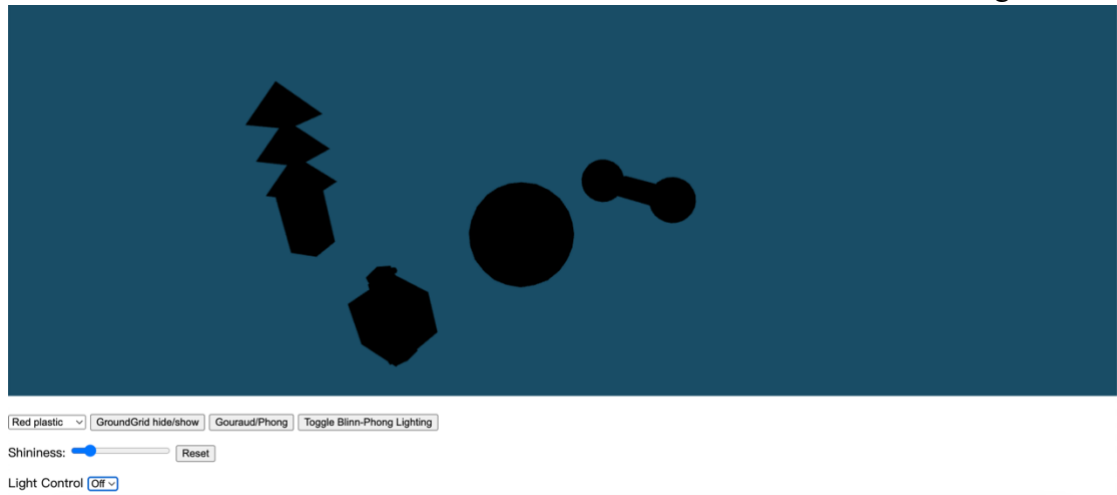
(5) Phong shading with one lighting



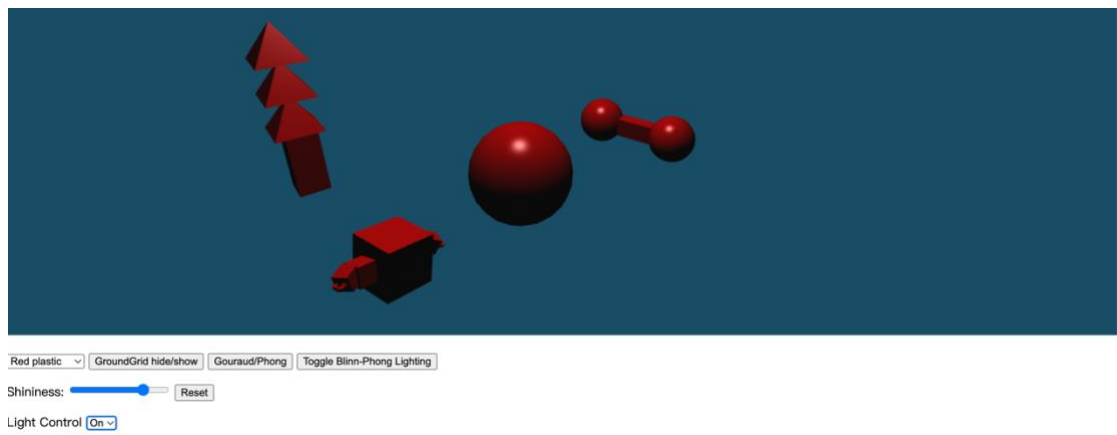
(6) Phong shading with another lighting



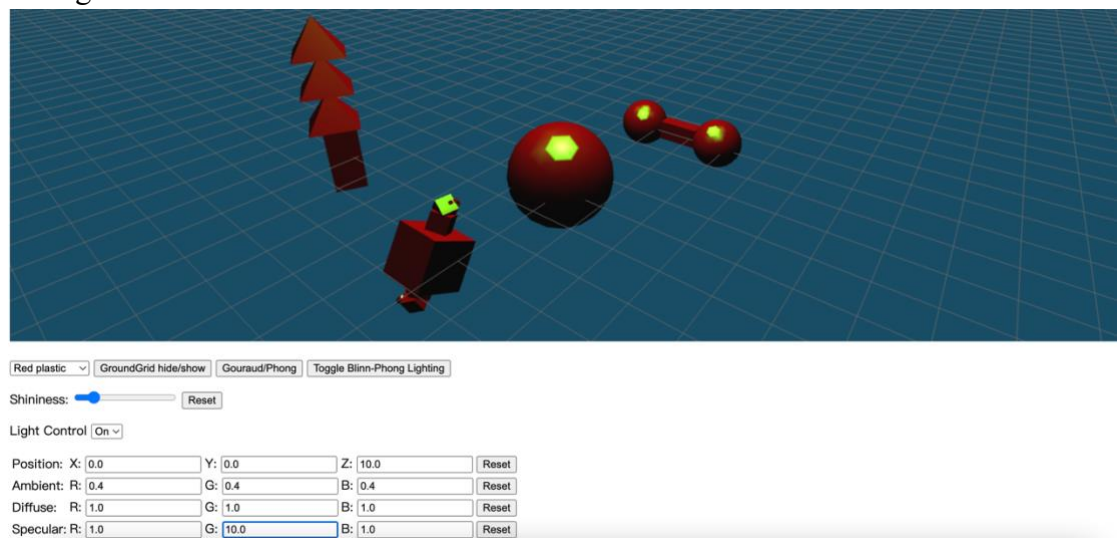
(7) Turn off the light



(8) Change the shininess



(9) Change some attributes value



## Scene Graph

