

# Project C: Various Moving 3D Objects with Camera and Light Effects

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## **Users' Guide:**

Implemented multiple solid, jointed and flexing shapes and one large slow-spinning sphere all of which have different material. As we can see, all the shapes are on the ground grid and can be seen from various angles by changing camera position and view angles. User can also play with the lighting modes, viz. Phong lighting and Blinn-Phong lighting. Shading can also be switched between Phong and Gouraud.

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## **User instructions:**

1. Use arrow keys to move around the field on the canvas.
2. Use keys W, S, A and D to change the perspective view of the field on the canvas.
3. Press keys I, J, K and L to change the position of the lights.
4. Press Space bar to turn the lamp light on or off.
5. Press Enter key to turn the headlight on or off.
6. Press M to change the material and color of the sphere.
7. User can also change the light modes between Phong lighting and Blinn-Phong lighting by pressing the respective buttons as seen in the image below.

Change between Lighting and Shading:

Lighting Effect :

**Change Lighting Effect**

Shading Effect :

**Change Shading Effect**

8. User can use 9 different input parameters that can individually affect the lamp light source, the UI to which can be seen in the image below.

Light source :

Lamp-Ambi-Red :  Lamp-Ambi-Green :  Lamp-Ambi-Blue :

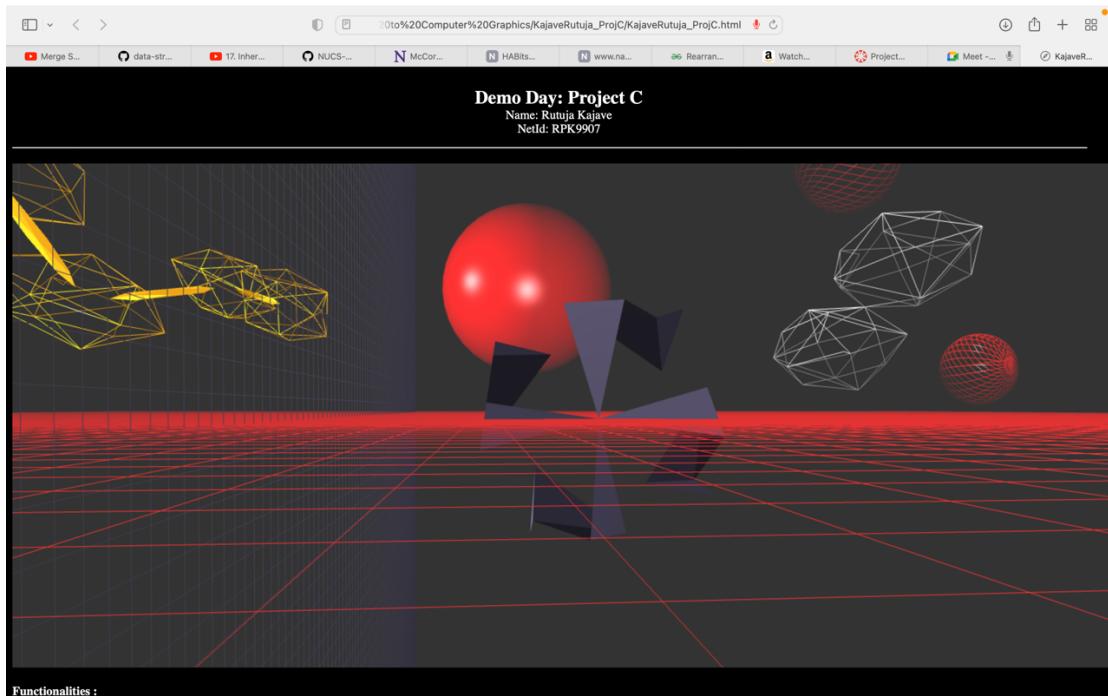
Lamp-Diff-Red :  Lamp-Diff-Green :  Lamp-Diff-Blue :

Lamp-Spec-Red :  Lamp-Spec-Green :  Lamp-Spec-Blue :

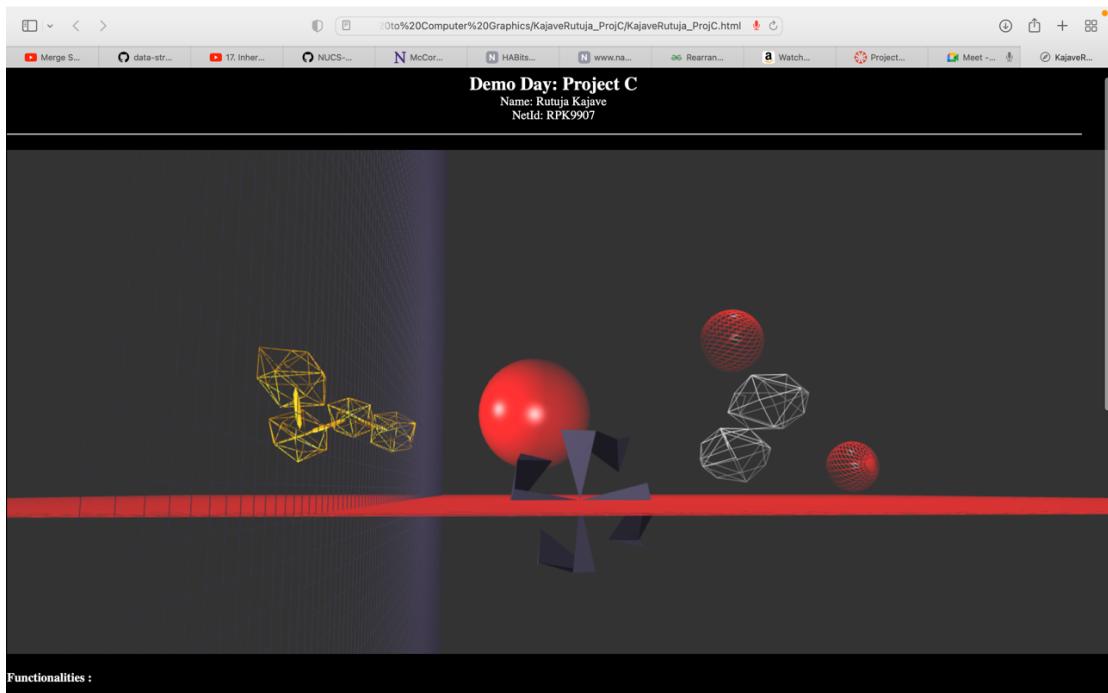
**S U B M I T**

**Result:**

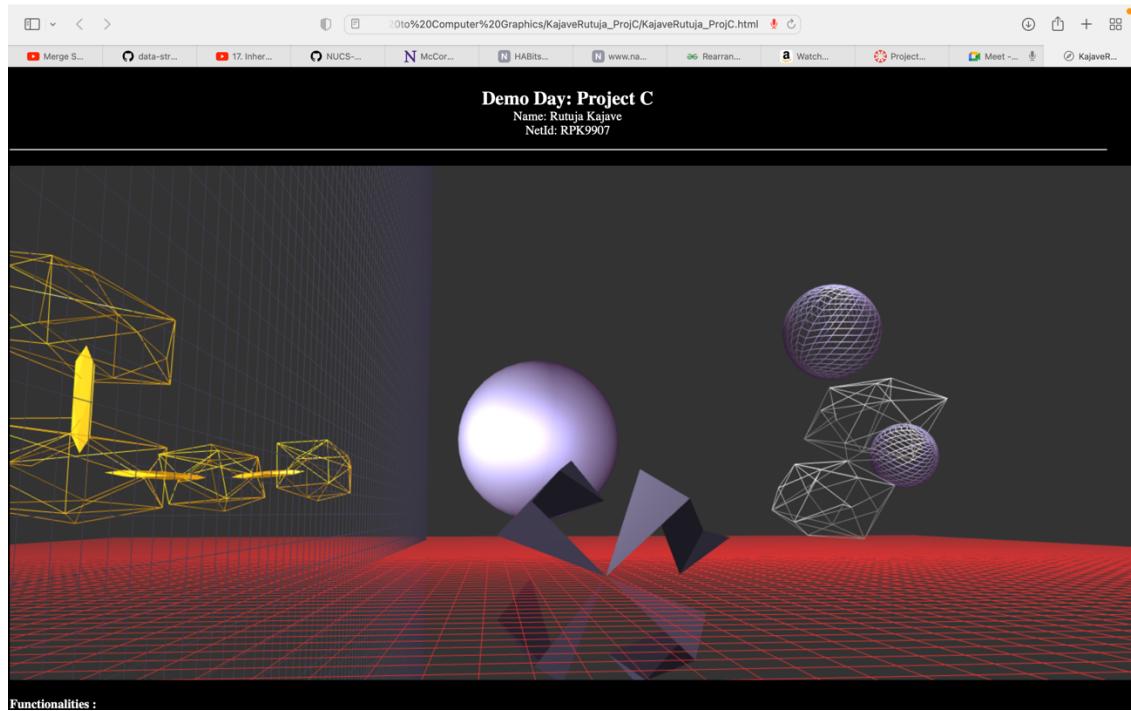
- a. When you open the .html file, following view can be seen on the canvas.



- b. When we change the camera position, the output is as follows.

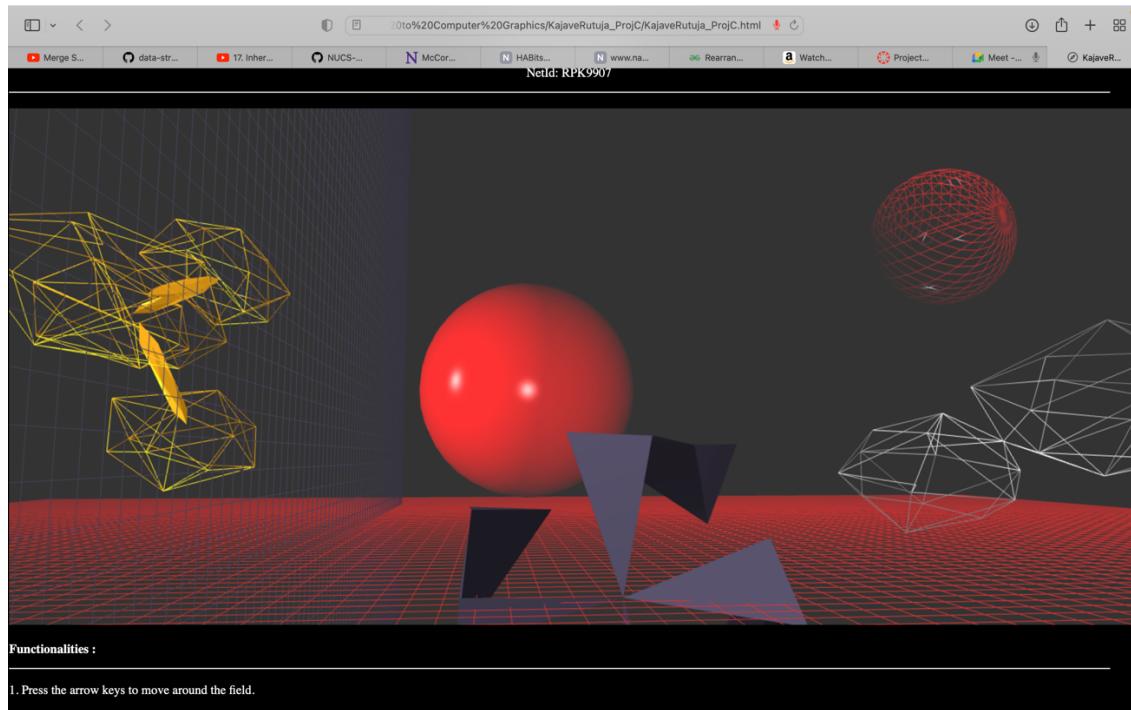


c. After changing the material of the sphere, the following output can be seen.

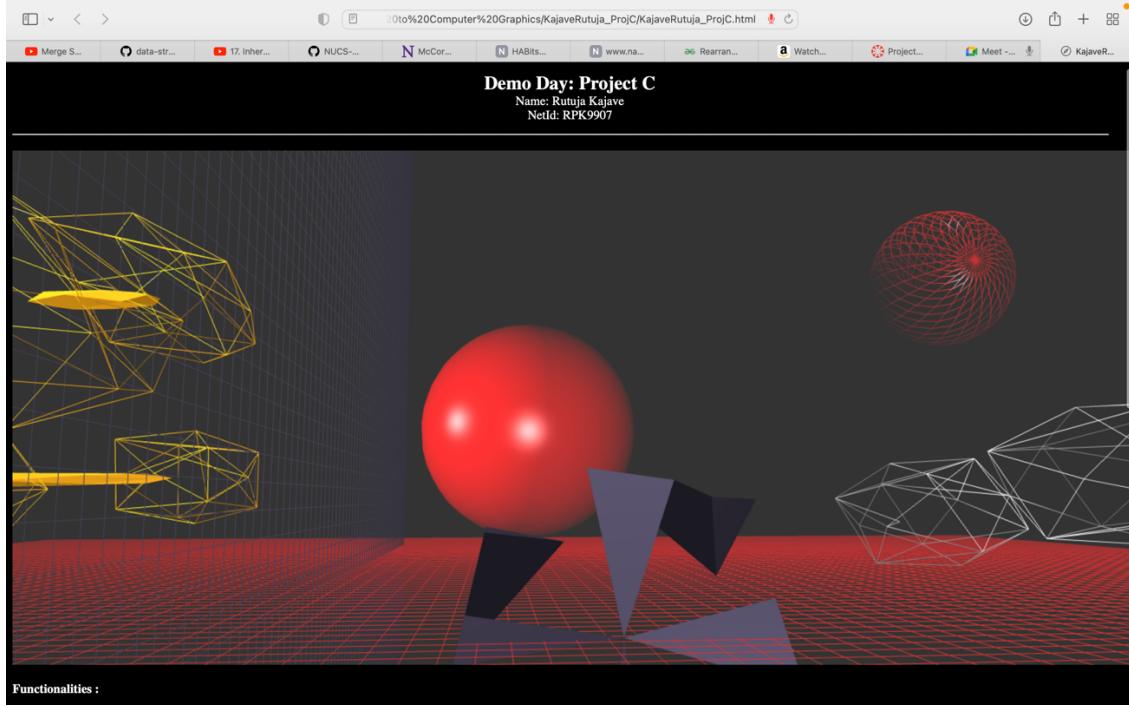


d. After changing the light modes, the output is as follows.

Before:

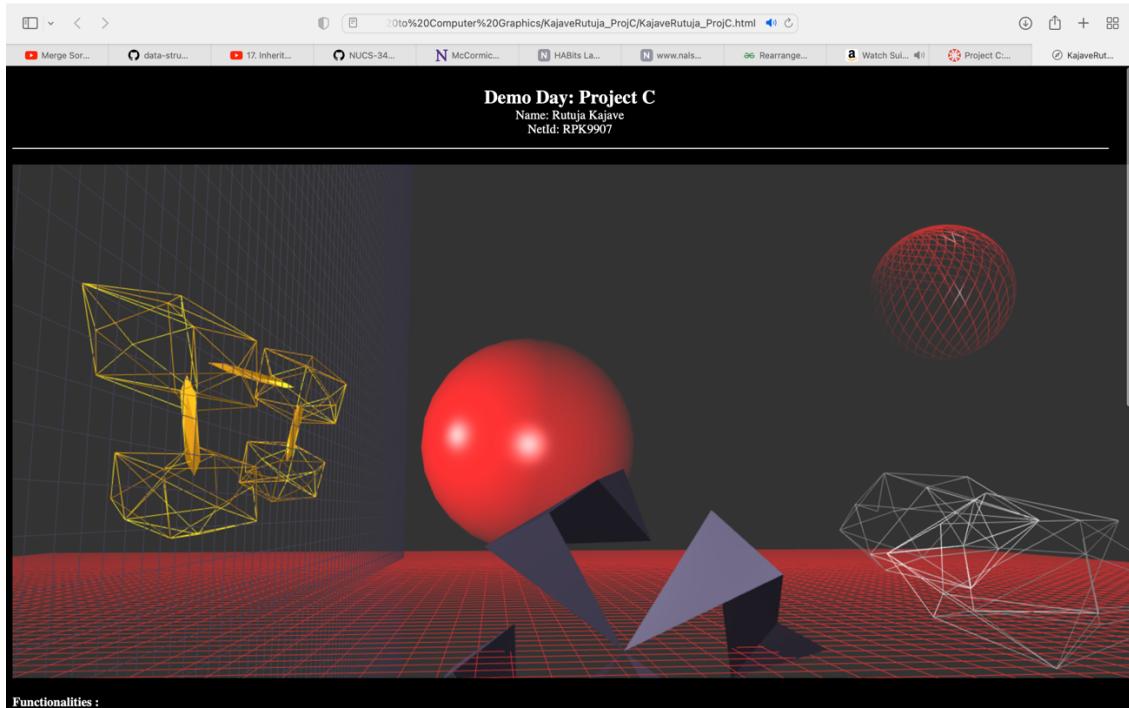


After:

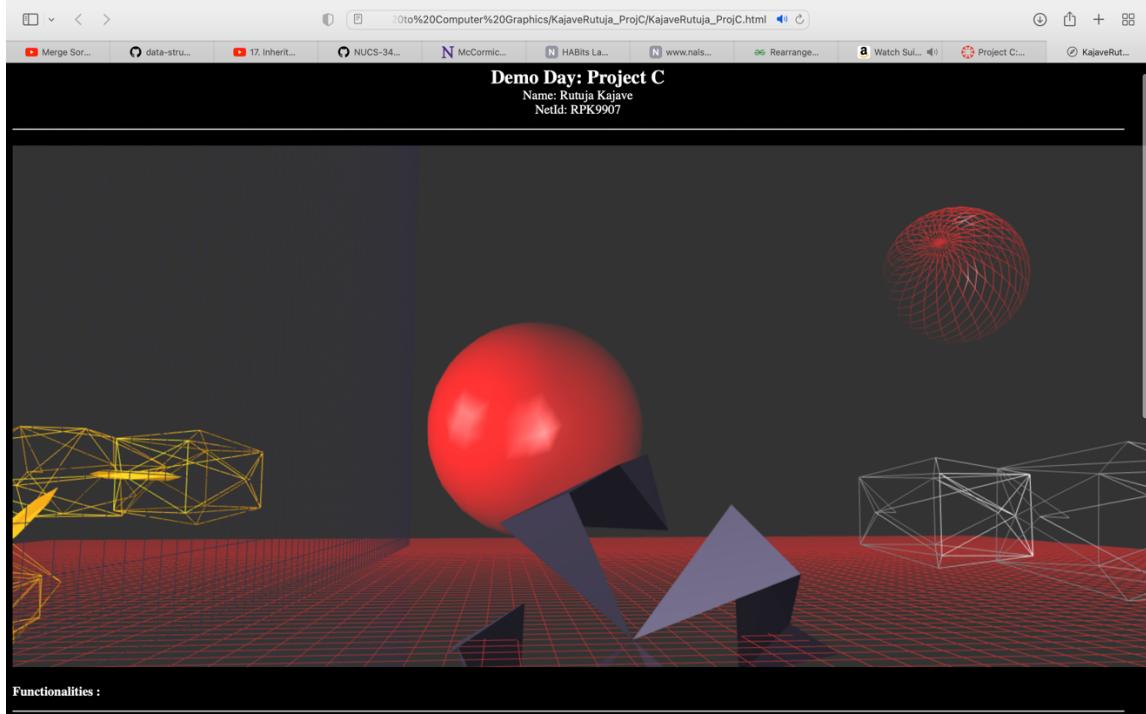


e. After changing the shading mode, the output is as follows.

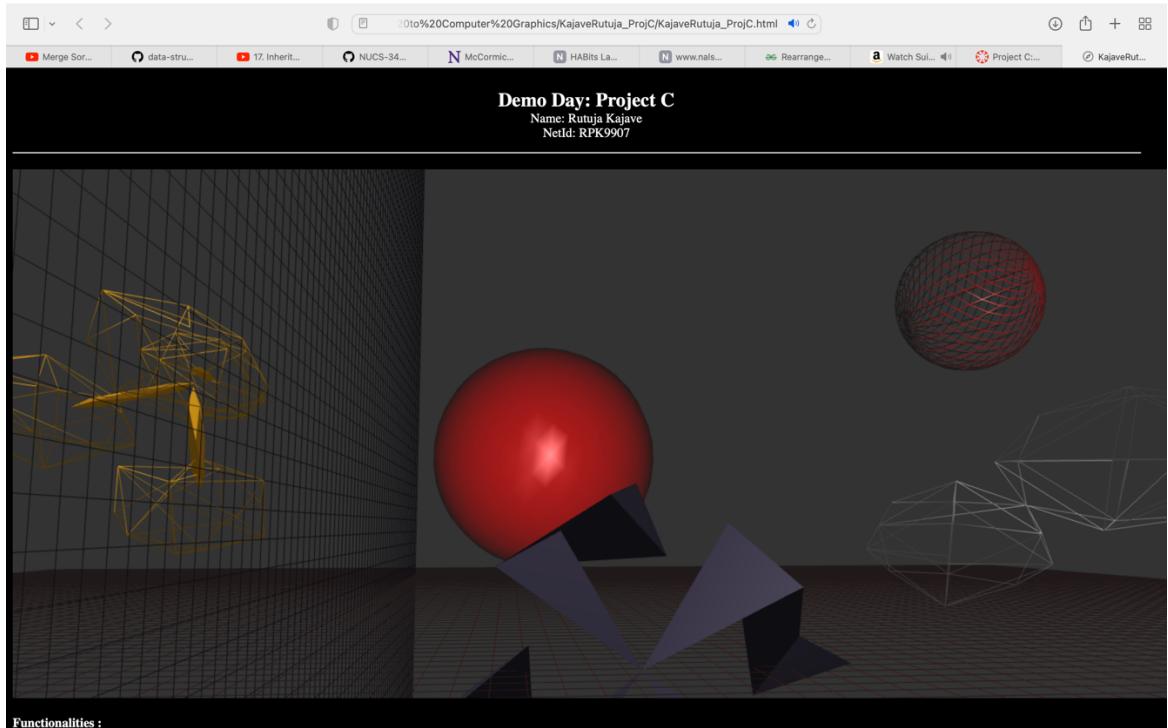
Before:



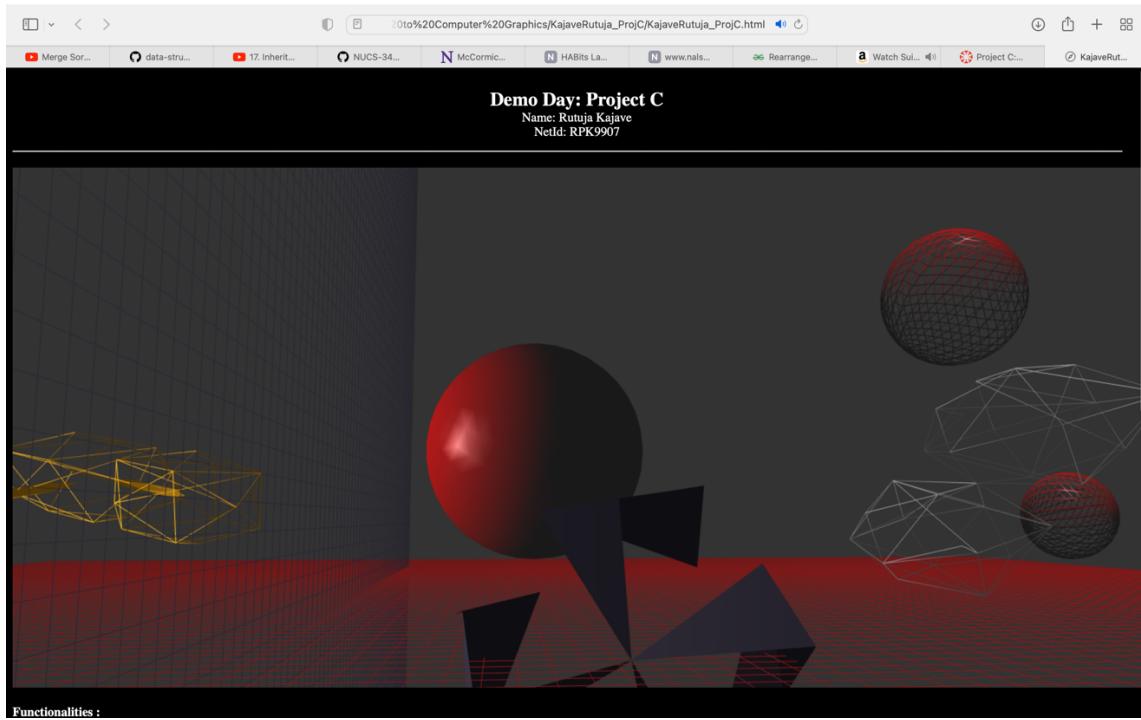
After:



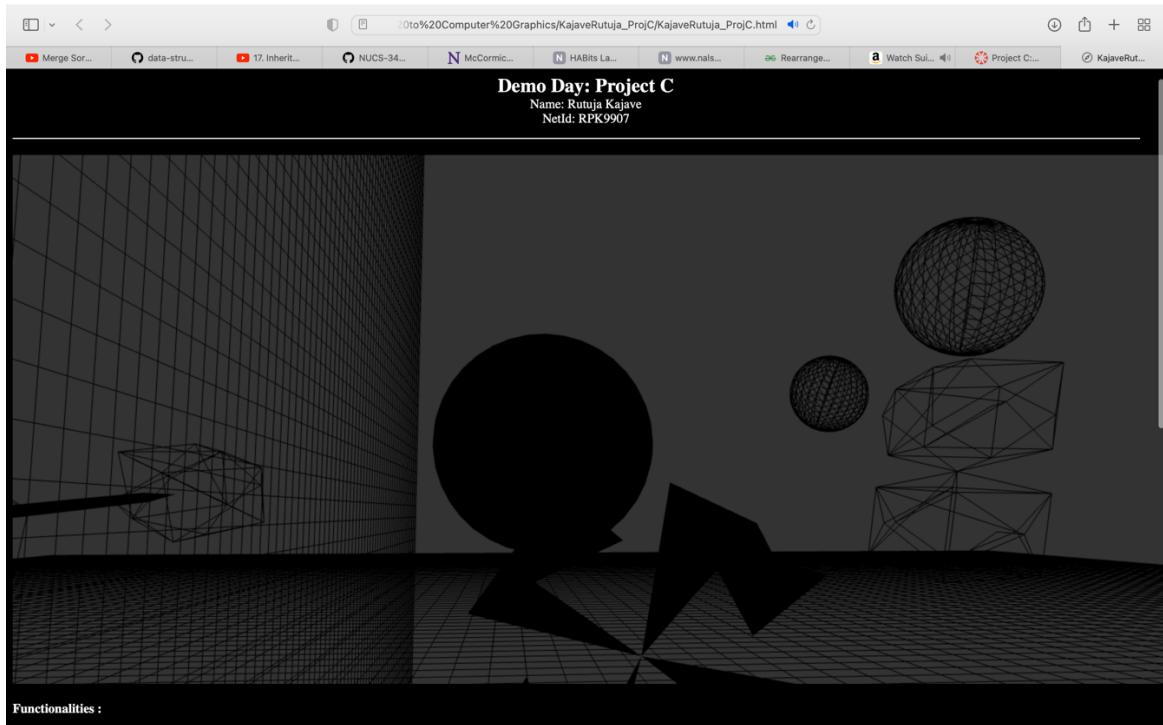
f. After turning off the lamp, we can see the following output.



g. After turning off the headlight we can see the following output.



h. After turning off both the lamp and the headlight, we can see the following output.



i. After changing few of the parameters, we can see the following output.

