PROJECT MANUAL

This Weeks Submission :

Module 1 :Cube with DAT GUI

```
var cam = gui.addFolder('Camera');
cam.add(camera.position, 'x', -1000, 1000).listen();
cam.add(camera.position, 'y', -1000, 1000).listen();
cam.add(camera.position, 'z', -1000, 1000).listen();
cam.open();

var box = gui.addFolder('Cube');
box.add(cube.scale, 'x', 0, 100).name('Width').listen();
box.add(cube.scale, 'y', 0, 100).name('Height').listen();
box.add(cube.scale, 'z', 0, 100).name('Length').listen();
box.add(cube.material, 'wireframe').listen();
box.open();

var speed= gui.addFolder('Speed');
model= speed.add(cube.rotation,'x',0,0.2).name("X-Axis").listen
    speed.open();

    model.onChange(animate);
```

Camera Position	X	Y	Z
Minimum	-1000	-1000	-1000
Maximum	1000	1000	1000

Scaling	X	Y	Z
Minimum	0	0	0
Maximum	100	100	100

Material	Wireframe
Enabled	Default
Solid	Option

Rotation	X	Y	Z
	Enabled	Not ENabled	Not Enabled

The User Does not have the Option to input the Length , Breadth and Height of the Cube as it is Hard-coded.

This Module has been Implemented to show User Control over :
- Rotation along X axis.
- Scaling.
- Camera Position Movement.
- Material Change through Checkbox.

The User does not have the Access to Change :
- Color.
- Material Type.
- Specify the dimensions of the cube.

Module 2 :Cube with DAT GUI

Scaling	X	Y	Z
Minimum	0	0	0
Maximum	100	100	100

Material	Wireframe
Enabled	Default
Solid	Option

Rotation	X	Y	Z
	Enabled	Not ENabled	Not Enabled

The User Does not have the Option to input the Height and Radius of the Cone as it is Hard-coded.

This Module has been Implemented to show User Control over :
- Rotation along X axis.

- Scaling.
- Camera Position Movement.
- Material Change through Checkbox.

The User does not have the Access to Change :
• Color.
• Material Type.
• Specify the dimensions of the Cone.

Module 3 :Sphere with DAT GUI

Scaling	X	Y	Z
Minimum	0	0	0
Maximum	100	100	100

Material	Wireframe
Enabled	Default
Solid	Option

Rotation	X	Y	Z
	Enabled	Not ENabled	Not Enabled

The User Does not have the Option to input the Radius of the Sphere as it is Hard-coded.

This Module has been Implemented to show User Control over :
- Rotation along X axis.
- Scaling.
- Camera Position Movement.
- Material Change through Checkbox.

The User does not have the Access to Change :
• Color.
• Material Type.

• Specify the dimensions of the Sphere.

Module 4 :Cylinder with DAT GUI

Scaling	X	Y	Z
Minimum	0	0	0
Maximum	100	100	100

Material	Wireframe
Enabled	Default
Solid	Option

Rotation	X	Y	Z
	Enabled	Not ENabled	Not Enabled

The User Does not have the Option to input the Height and Radius of the Cylinder as it is Hard-coded.

This Module has been Implemented to show User Control over :
• Rotation along X axis.
• Scaling.
• Camera Position Movement.
• Material Change through Checkbox.

The User does not have the Access to Change :
• Color.
• Material Type.
• Specify the dimensions of the Cylinder.

Module 5 :Animation

• I have used a Sphere and Cube of Mesh Lambert Material.
• The Size and Dimensions of the figures are Hardcoded.

The User has the Ability to Control the Bouncing Speed of the Ball and the rotation speed of the Cube.

The Rotation has a Maximum and Minimum values 0.0 to 0.5 Respectively.
The Bouncing has a Maximum and Minimum values 0.0 to 0.5 Respectively.

- The values can be changed using the Slider on the Dat GUI panel.
- The values on change will be iteratively used in the render Animation function to increase and decrease the Speeds as per User Input.

A spotlight is used to Illuminate the Entire Plane.
It is set at a position of (-40, 60, -10) to illuminate the Animation.

Module 6 & 7 & 8 :Texture and Bump Mapping on Cube and Sphere

- This Module is entirely to Highlight the Usage of Mapping of textures on A 3D object.
- Mesh Phong materials are Used as it has property of doing Shine on to the object .
- The Image used is that of Earth which is Mapped onto Both a cube and Sphere.
- Bump map of the Earth obtained through the internet is mapped on Sphere to create the Effect of Mountains and Plateaus of the Earth

Observations are :

A. For A cube the Image is Mapped on each face separately and not entirely Mapped as a single image but as 8 images.
B. For a Sphere the Wrapping is a Single Image for the Entire Body.
C. We need Lights to illuminate the Image Mapped else it is rendered as a Black object on to the Screen.
D. Bump Map is mapped Along with the texture to add depth and make depth visible in the sphere.