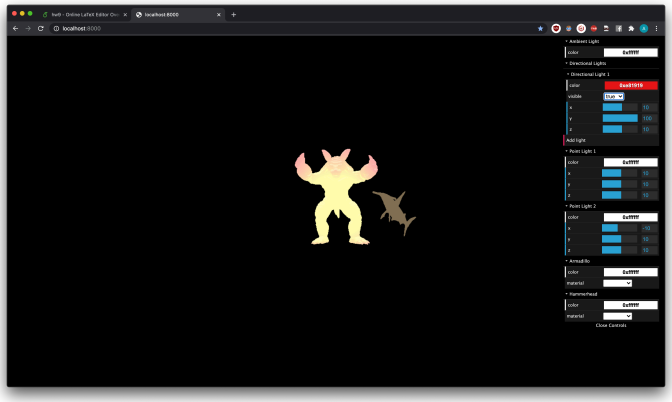
University of Massachusetts Boston

CS460

CS460 Fall 2020
Github Username: alvin688
Due Date: 11/30/2020

Assignment 9: Geometry, Materials, and Lighting!

We will load our favorite mesh from a file, try out different materials, and play around with light settings.



Starter code for assignment 9. After pulling from upstream, there is the folder `09` in your fork. If you run a webserver and access the file, you will see a sad single armadillo in the scene.

Part 1 (14 points): The armadillo needs a friend! Please load a second mesh from a file using a THREE.js loader. This could be any mesh you find online in any format THREE.js supports - or you could load the armadillo again. Please modify the positions so that the meshes do not overlap.

Part 2 (15 points): Please configure the second mesh from above with a different material of your choice (not MeshToonMaterial again!).

Part 3 (10 points): Please add two point light sources to the scene.

Part 4 (15 points): The starter code includes the following snippet to control the color and position of the directional light.

```
var directionalFolder = gui.addFolder('Directional Light');
directionalFolder.addColor(controller, 'color').onChange( function(value) {
  directionalLight.color.setHex(value);
});
directionalFolder.add(directionalLight.position, 'x', -100, 100);
directionalFolder.add(directionalLight.position, 'y', -100, 100);
directionalFolder.add(directionalLight.position, 'z', -100, 100);
directionalFolder.open();
```

Please setup dat.GUI to control position and color of the two point lights with similar code.

Part 5 (15 points): Please setup dat.GUI to control the color of both materials.

Part 6 (30 points): Please play around with the lights and try to understand why the toon material seems to work *sometimes*. What are your observations?

The toon material seems to work depending on how much light there is. The directional light has a large intensity. When there is too much light, it is very difficult to make out the appearance of the material (it just becomes one color). With the spotlights, the lights are typically weaker and harder to see on the mesh. The material ”working” is dependent on light angles and intensity.

Part 9 (1 points): Please update the screenshot above with your own and then post the github pages url here:

`https://alvin688.github.io/cs460student/09` I used the following reference for help me with part 5 and pointlights because my lights didn't seem to work. I also used it to help me with the bonus. I added a visibility feature to the lights to ”remove” them. This was done in the same way as changing the material on the meshes.

`https://github.com/lorifranke/cs460student/blob/master/09/index.html`

Bonus (33 points):

Part 1 (11 points): Please add dat.GUI elements that allow to switch the material for the two meshes. Here is an example of a combobox in dat.GUI:

```
// Choose from accepted values
gui.add(controller, 'material', [ 'toon', 'standard', 'phong' ] ).onChange( function(value) {

  if (value == 'phong') {
    // TODO
  }

});
```

Part 2 (22 points): Please make adding lights to the scene dynamic: Add dat.GUI buttons to add new directional lights that then also add a dat.GUI folder to the menu that allows to control (color and position), and remove the light.