CS460 Fall 2019
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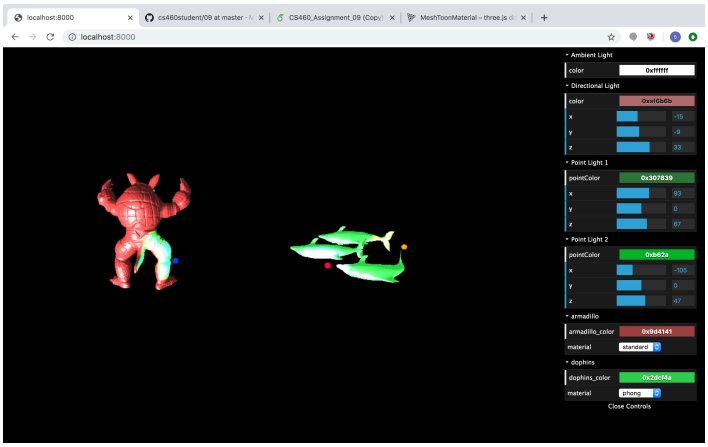
Assignment 9: Geometry, Materials, and Lighting!

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?

When we are changing color to toon material, sometimes the toon material will change its color and sometimes not. The reason why this happens is because the property of toon material in three js document in which the change of color will be related to how the ambient light projecting to the mesh. It also seems that when point light is shining to the tool material, there are always white light, whereas the the point light will have its original color shining on the other mesh material. Sometimes when we change the direction of directional light, the color would show up with the color we set on. However, if we set the mesh itself as different color, the mesh will have different color because the color we see will be the combination of light color and mesh color. Thus when we are changing the color and light, something strange will show up. That's why the toon material will work "sometimes".

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

`https://mushaddict.github.io/cs460student/09/`

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.