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Project 3: Three.js

CMSC 405 7980 Computer Graphics

University of Maryland University College

Due Date: April 23, 2017

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Brief Description of Project:

The purpose of this project is to create a unique 3D animated scene that is composed of the Three.js graphic components. The 3D scene had to meet the following requirements: the size of the scene must be 640 X 480, there must be at least six different shapes used. The scene should also use multiple lighting effects, as well as, radio buttons, slider bars, or other widgets to turn on or off certain parts of the components of the animation.

Design and Functionality:

Project3.html

- Implements the Three.js files: three.min.js, and three.js
- Defines variables to be used throughout the 3D scene
- Creates a function method: createWorld to display the objects to be used in the scene.
- Creates and positions the camera and lighting for the scene using DirectionalLight.
- Creates a new 3D object called model. All objects in the scene will be added to this.
- Creates trees using Cylinder Geometry, and creates a light on each tree using Sphere Geometry.
- Uses MeshPhongMaterial to create the trees.
- Implements the clone method to clone the first created tree, three more times.
- Adds the trees to the created 3D object called model.
- Creates a snowman using Sphere Geometry, Cylinder Geometry, and MeshPhongMaterial to create the three balls, nose, eyes, buttons, arms, and hat.
- Adds the snowman to the created 3D object called model.

- Creates the outside which is the walls, and floor of the scene.
- Uses Plane Geometry, and MeshBasicMaterial to do this.
- Clones the tree 3D Object, and snowman 3D Object.
- Adds the outside to the created 3D object called model.
- Creates a function method called render, which is called for each frame of the animation.
- Creates a function method called updateForFrame to control the animation of the snowman and trees.
- Creates a function method called doFrame, which is a function that runs the animation by calling the updateForFrame method.
- Creates a function method doAnimateCheckbox, which controls the animation of the scene each time the Animate checkbox is either selected or deselected.
- Creates a function method called doKey, which is used to rotate the scene using the left, right, up, down, page up, page down, and home keys.
- Creates a function method called doChangeModel, which allows you to look at individual items created in the scene, as well as, apply animation to them items.
- Creates a function method called init is called when the document has loaded.
- Creates headings, checkboxes, and radio buttons, for the scene.

Three.js

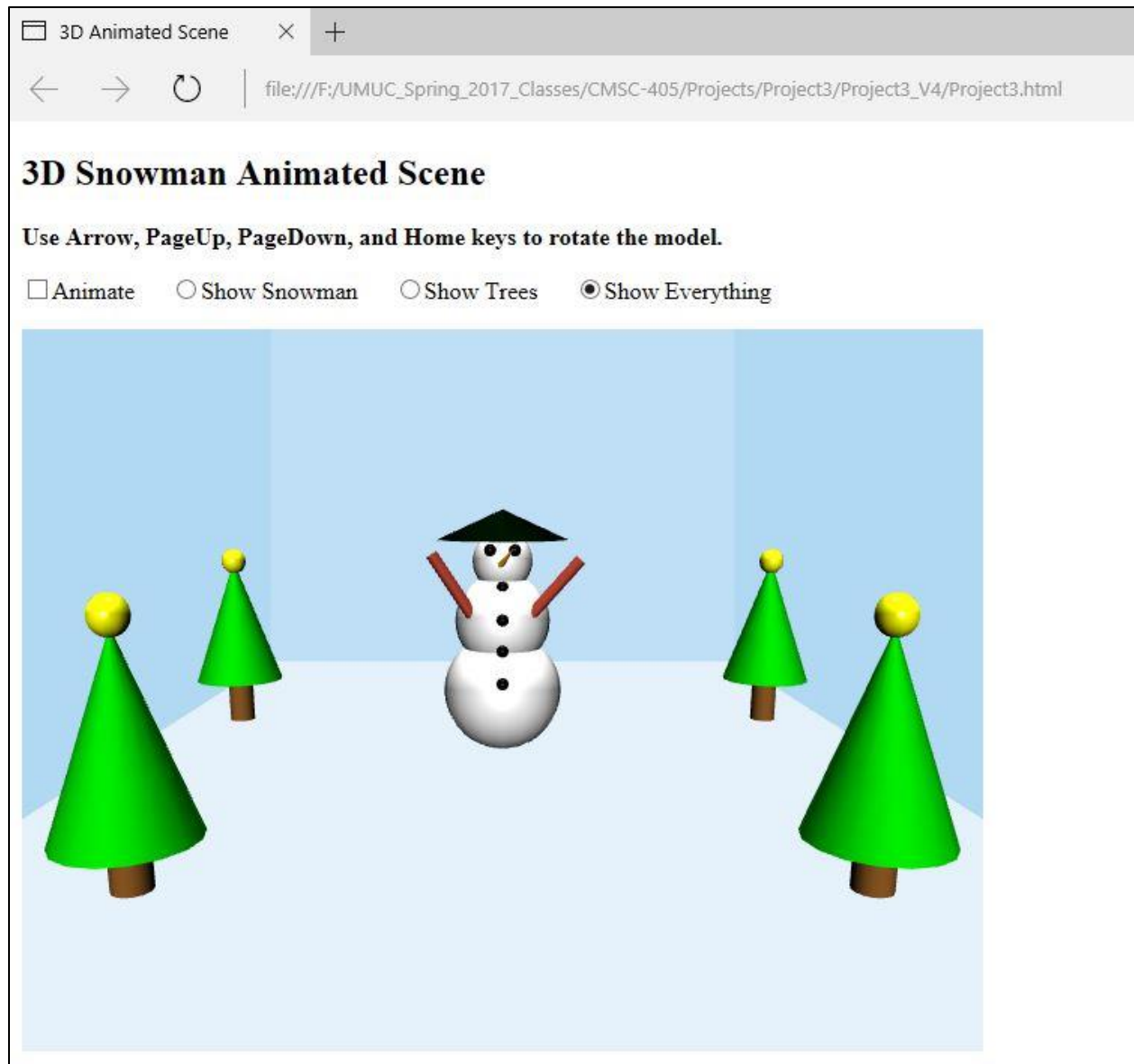
- This class is provided in the readings

Three.min.js

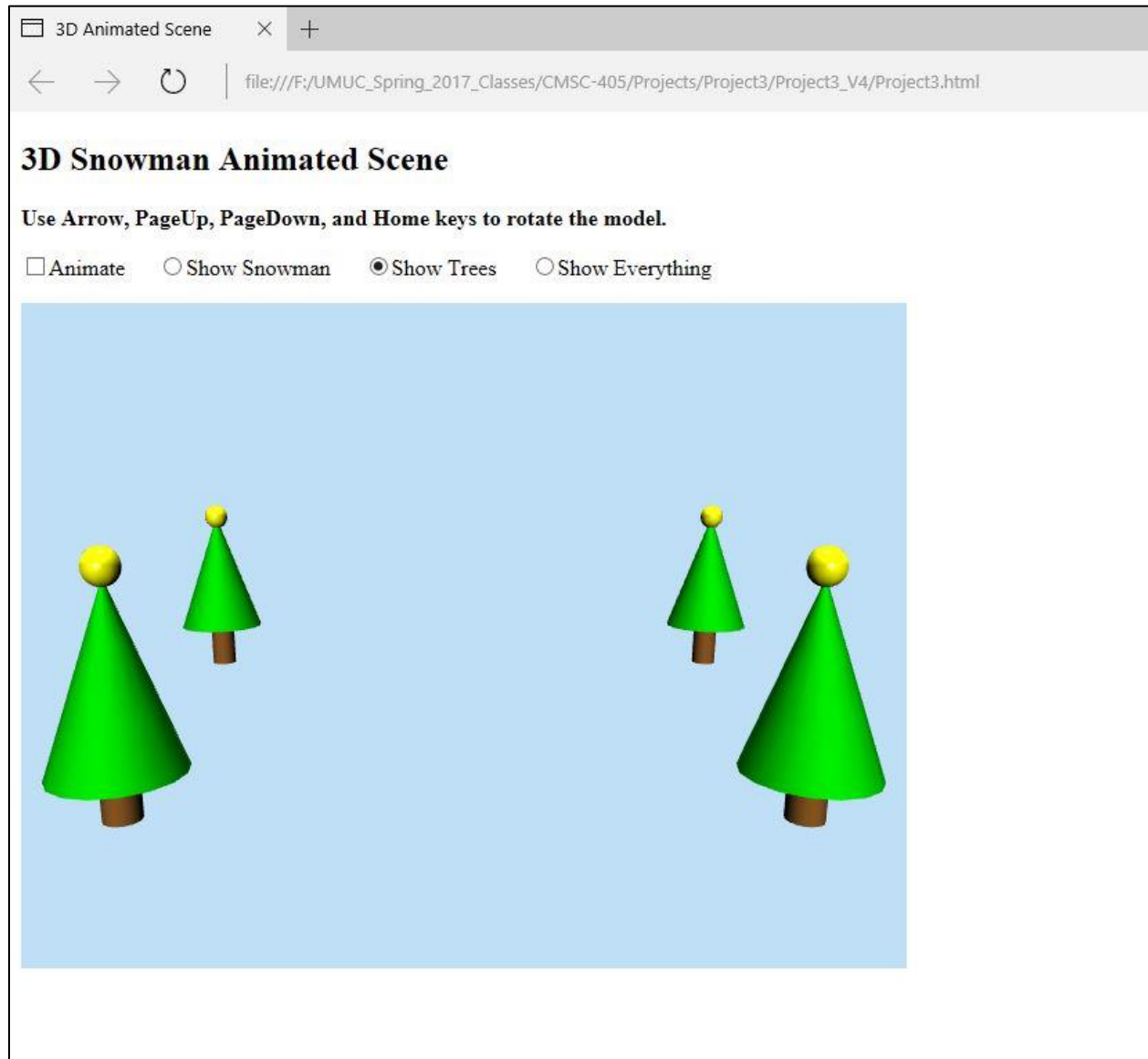
- This class is provided in the readings

Screenshots:

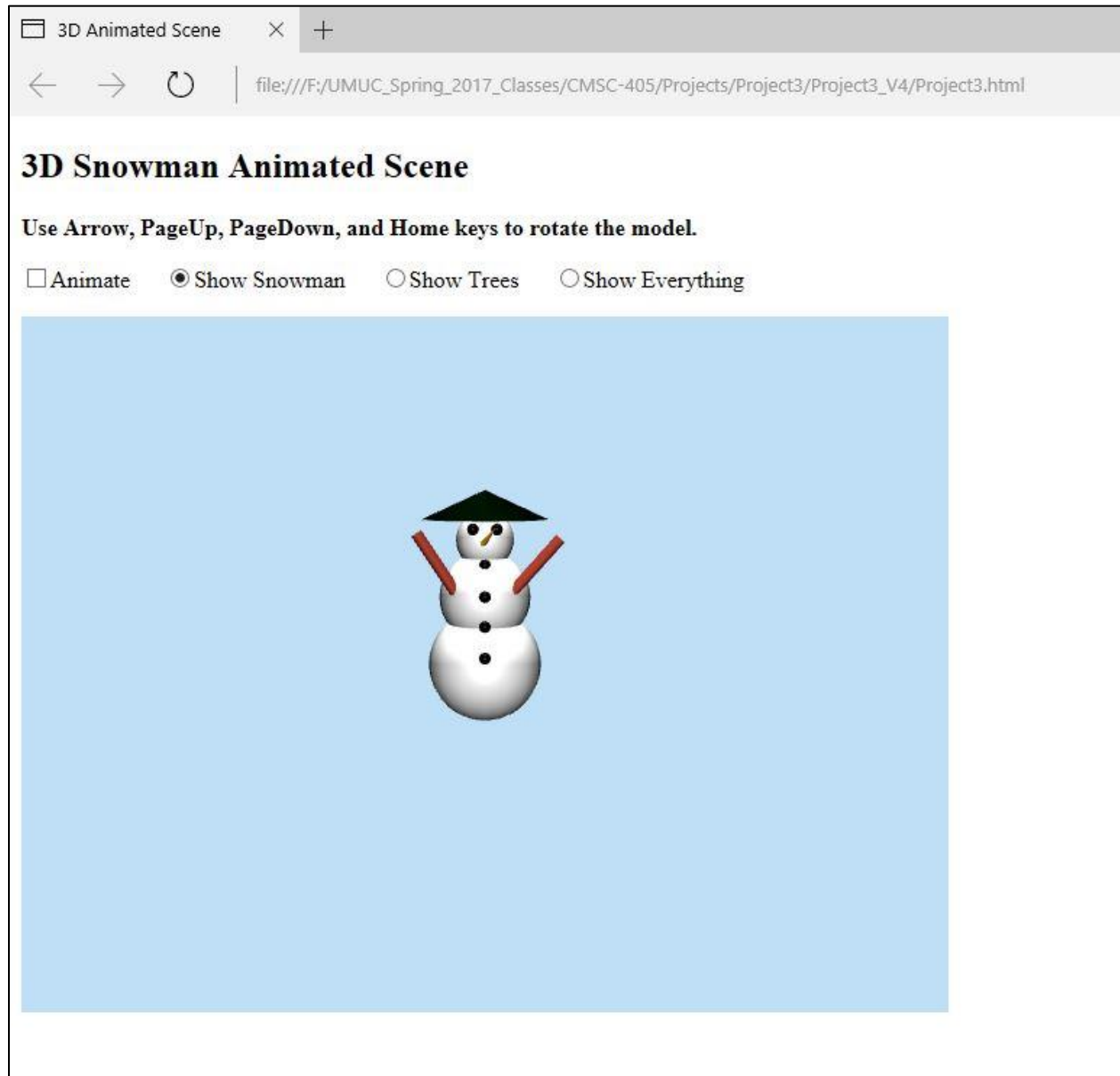
Shows Everything in the Scene:



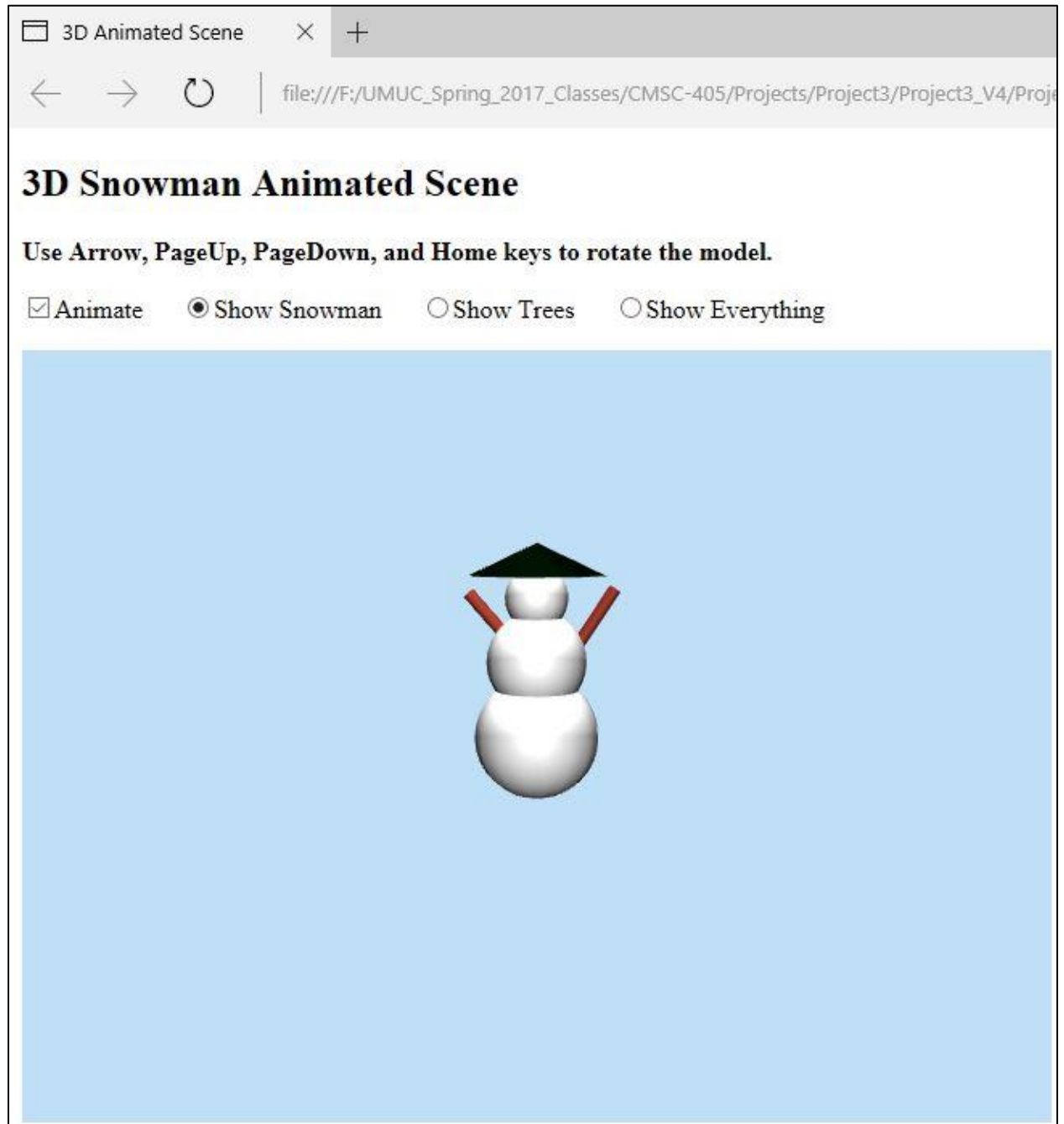
Shows Just the Trees in the Scene:

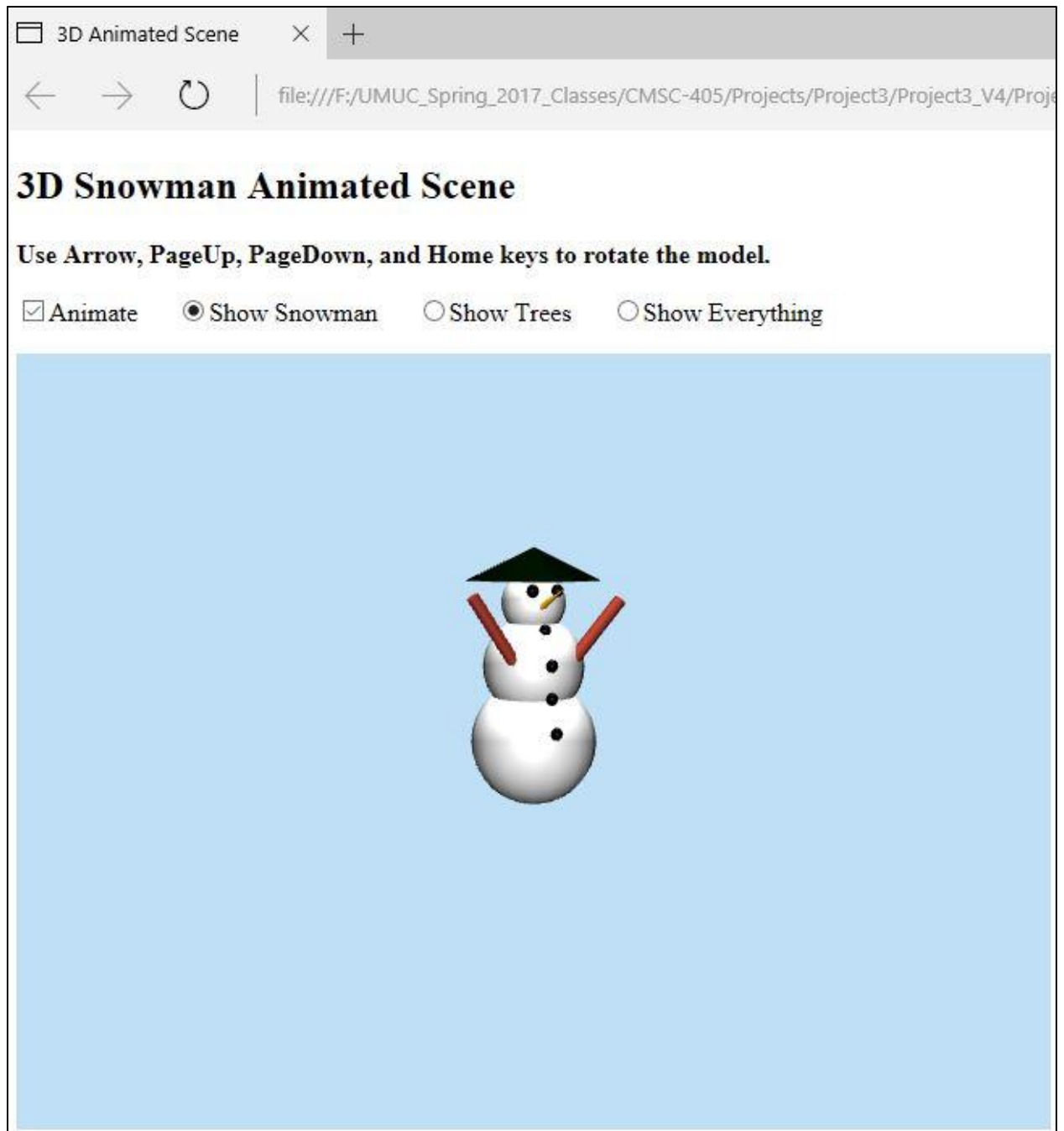


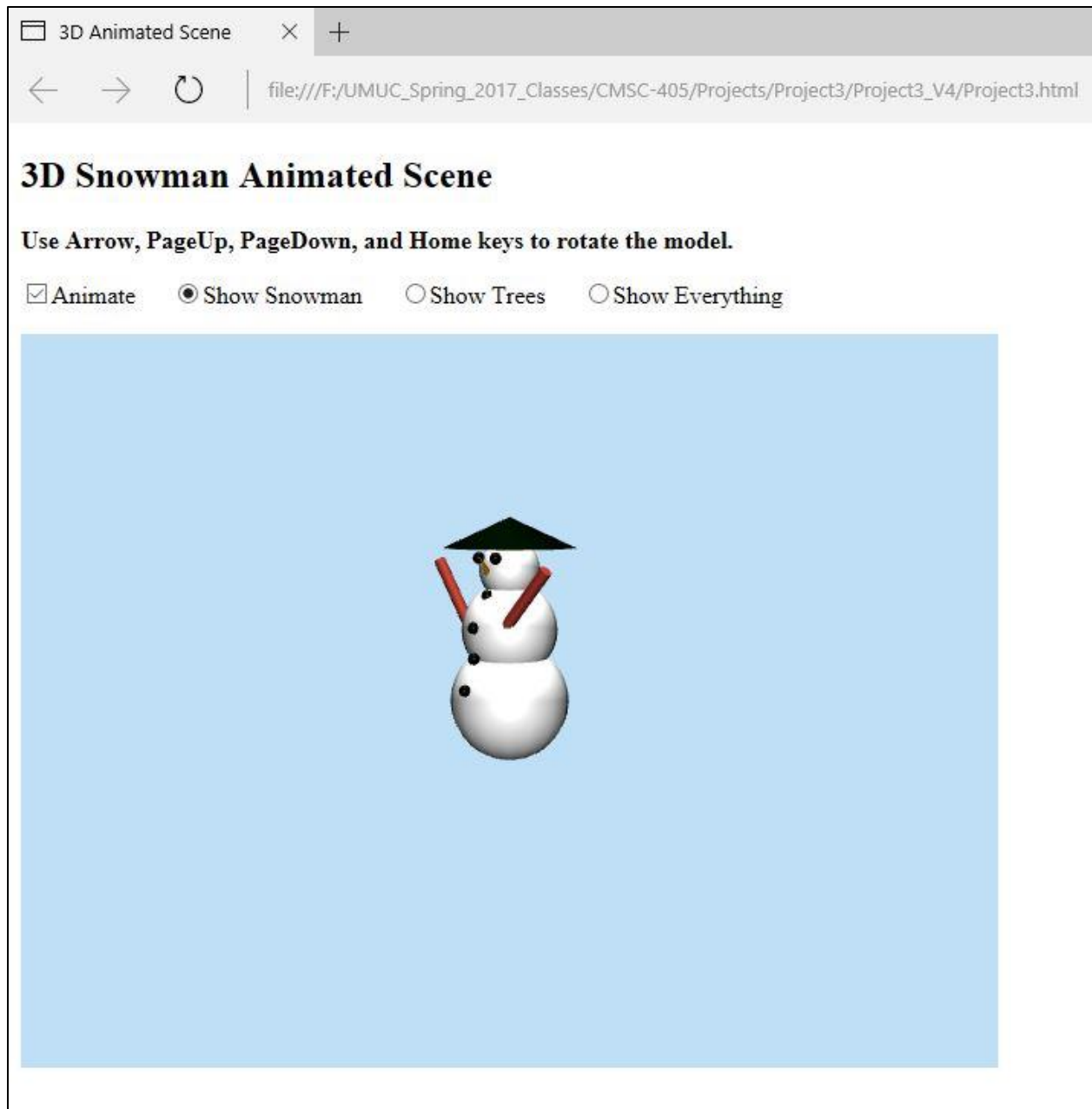
Shows Just the Snowman in the Scene:



Shows Animation Applied to Snowman

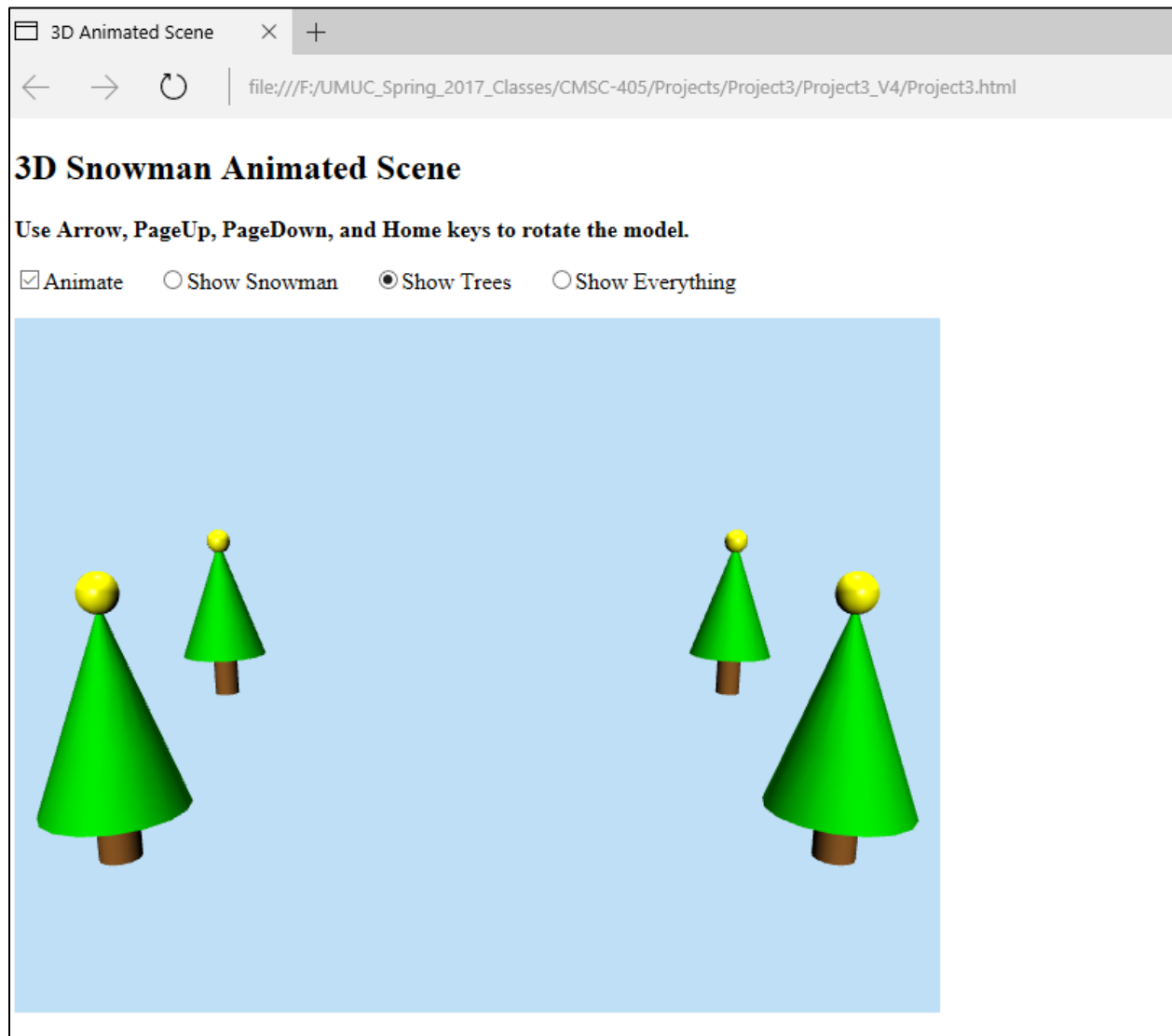






Shows Animation Applied to Trees

It's hard to show a screenshot of this, but when you run the program you will see that the trees spin.



Lesson Learned:

After completing project 3, there are many things that I learned throughout the process of creating a 3D scene composed of three.js graphic components. The first thing I did, like with all programming projects I am given, was to first read over the instructions, and understand what is being asked. This was my first time ever really working with JavaScript and the libraries it has to offer for creating 3D graphic scenes, so understanding the new methods, and functions was the hardest part for me. Once I was able to get a grip on this, I was able to successfully create a 3D scene composed of three.js graphical components.