Project 3 Test Report

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Program Overview

In the Three js Project Program, a web page displays with a title, web page description, two checkboxes, and a 3d animation. The transforms that take place in the animation do not start until one of the checkboxes is selected. The first checkbox rotates the background, a sky divided into daytime and nighttime, and the second check rotates the mini planet at the center of the animation.

The program contains two classes and multiple functions that work to implement all functionality. All these classes are located within the file "project-3.html". The first class, called Cloud implements the cloud shape and is used in the daytime portion of the sky. The second class is named Star and implements the star shape that is used in the nighttime portion of the sky. From there, the createSky function creates the divided sky colors and all three shapes are assigned to the skyRotator object.

The next function, called createPlanet, creates the 3d shape of the planet with hills and rocks on it. These shapes are added to the worldRotator object. The functions createTree and createFlower do just those things and are also added to the worldRotator object. The function createMoon creates the moon shape for the sky and is added to the skyRotator object.

Once all of the shape functions are created, they are assembled in the createWorld function, which also initializes the scene, camera, lighting, and the sun shape. There are two different lights for this scene. The first is the light that comes from the sun shape and the second is the light that comes from the moon shape.

The functions updateSkyFrame and updateWorldFrame update the rotations of the sky and world based on the user's checkbox selection. This selection is processed using the

doSkyFrame, doWorldFrame, doAnimateSkyCheckbox, and do AnimateWorldCheckbox.

Finally, the function init initializes the canvas, renderer, and checkboxes.

Execution

The initial webpage view displays the shapes in their initial order.
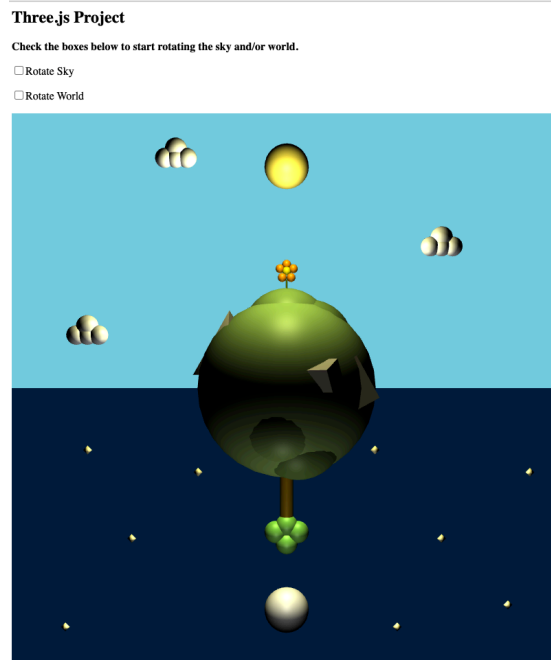
Figure 1. First frame of animation

If the user selects the first checkbox, the sky starts rotating to the left.
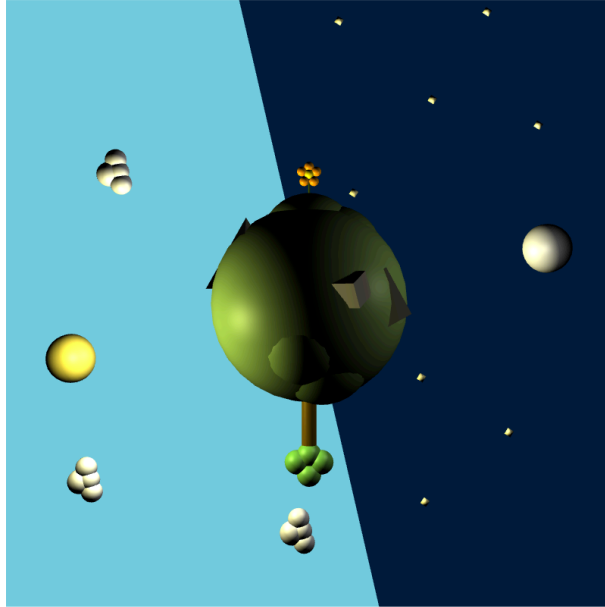

Figure 2. Sky rotating to the left

If the user unselects the first checkbox, the sky rotation will stop.

Figure 3. Halted sky rotation

If the user selects the second checkbox, the mini planet will rotate to the right.
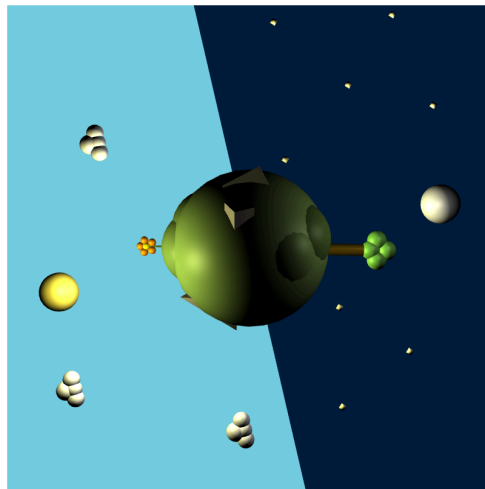
Figure 4. Mini planet rotating to the right

If the user selects the second checkbox again, the mini planet will stop rotating.
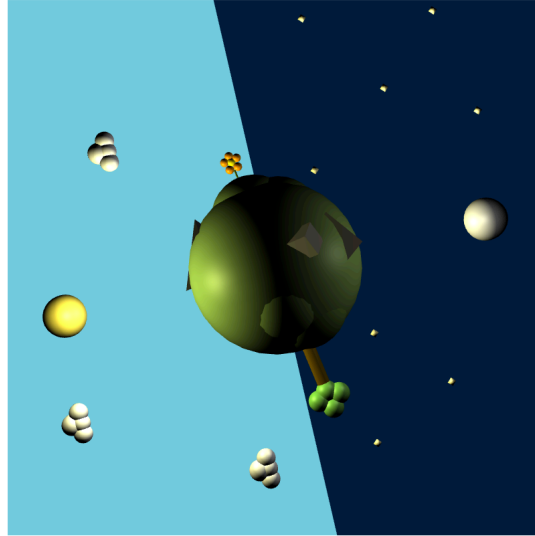
Figure 5. Mini planet rotation halted

If the user selects both checkboxes, the sky and planet will both rotate.
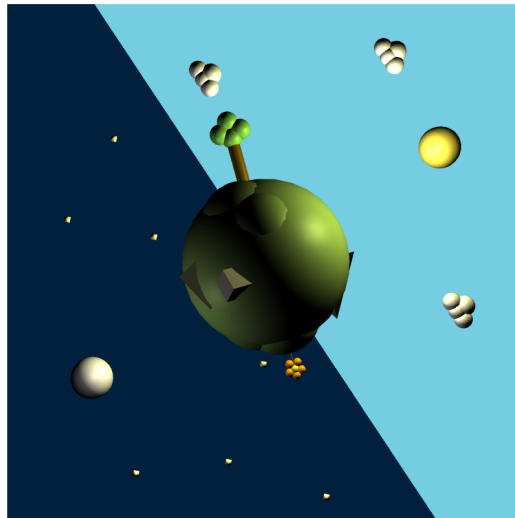
Figure 6. Sky and planet rotating

Tests

There will be test cases to test the functionality outlined below:

1. Ensure the program displays the initial frame correctly with shapes in the correct
    position.

2. Ensure the program applies a left rotation to the sky if the user selects the Rotate Sky
    checkbox.

3. Ensure the program halts the rotation to the sky if the user unselects the Rotate Sky
    checkbox.

4. Ensure the program applies a right rotation to the planet if the user selects the Rotate
    World checkbox.

5. Ensure the program halts the rotation to the planet if the user unselects the Rotate World
    checkbox.

6. Ensure the program starts both rotations if both checkboxes are selected.

Below you will see the Test Suite.

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Test Case	Input	Expected Output	Actual Output	Result
1	NA	All shapes displayed in initial positions	All shapes displayed in initial positions	Pass
2	"Rotate Sky" checkbox selected	Sky rotates to the left	Sky rotates to the left	Pass
3	"Rotate Sky" checkbox unselected	Sky stops rotating	Sky stops rotating	Pass
4	"Rotate World" checkbox selected	World rotates to the right	World rotates to the right	Pass
5	"Rotate World" checkbox unselected	World stops rotating	World stops rotating	Pass
6	"Rotate Sky" checkbox selected; "Rotate World" checkbox selected	Sky and planet rotate in opposite directions	Sky and planet rotate in opposite directions	Pass

Results

This program displays all the prompts and outputs successfully. It performs as expected and is a successful way to implement the lessons learned from weeks 5 and 6 of CMSC 405 since it covers Three.js.

References

Creating a scene. Three.js. (n.d.). Retrieved February 24, 2022, from
        https://threejs.org/docs/#manual/en/introduction/Creating-a-scene