BBM 414 - Computer Graphics Laboratory

HACETTEPE UNIVERSITY
Department of Computer Engineering

Programming Assignment 3
Fall 2023-2024
Assoc. Prof. Dr. Ufuk Çelikcan

Due Date: 23:59 pm on Friday, December 1st, 2023

WebGL2 Transformations and Basic GUI

Part 1

In this part, you will modify the given project by downloading from Piazza resources and obtain the shape of form given in Figure 1.

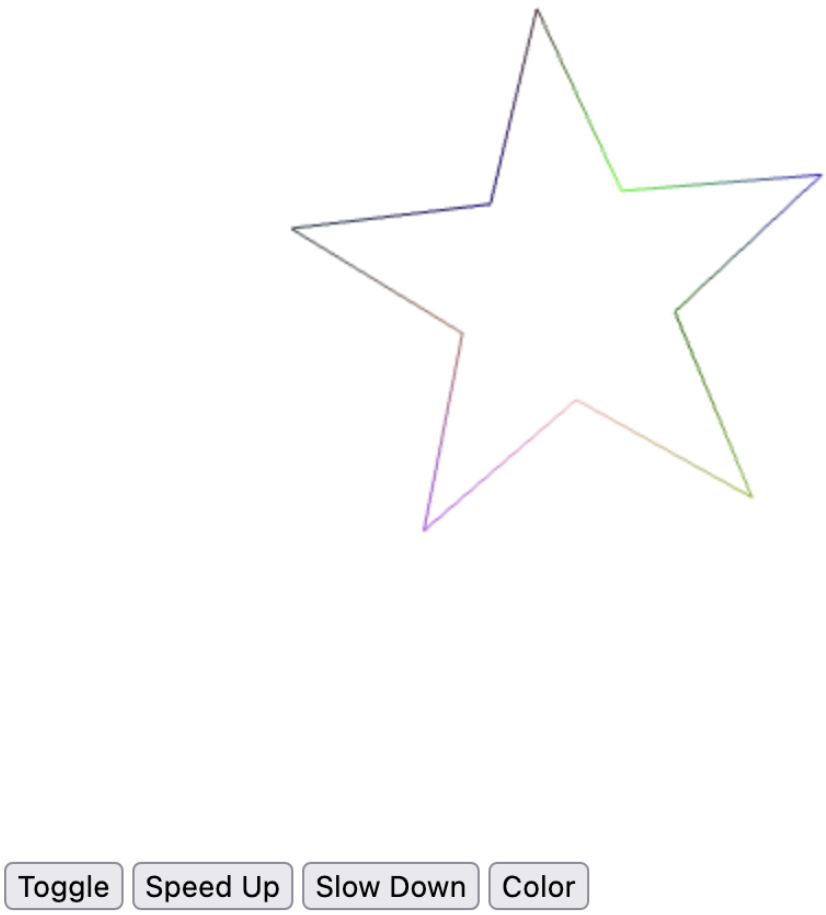

Figure 1: Rotating Star

- Download the source code rotatingSquare1 example from Piazza.
- Draw 5-star lines with random colors in the corners.
- Add four buttons to change the direction, to speed up, to slow down and to change the color randomly.

Part 2

In this part, you will get familiar with multiple transformations of shapes. You will use simple gui inputs from user and change rotations and scales using the defined functions with respect to the given inputs. The steps are explained in the following statements:

1. You will draw three shapes, 10-stars (see Figure 2) denoted to sun, earth and moon with simple gui.

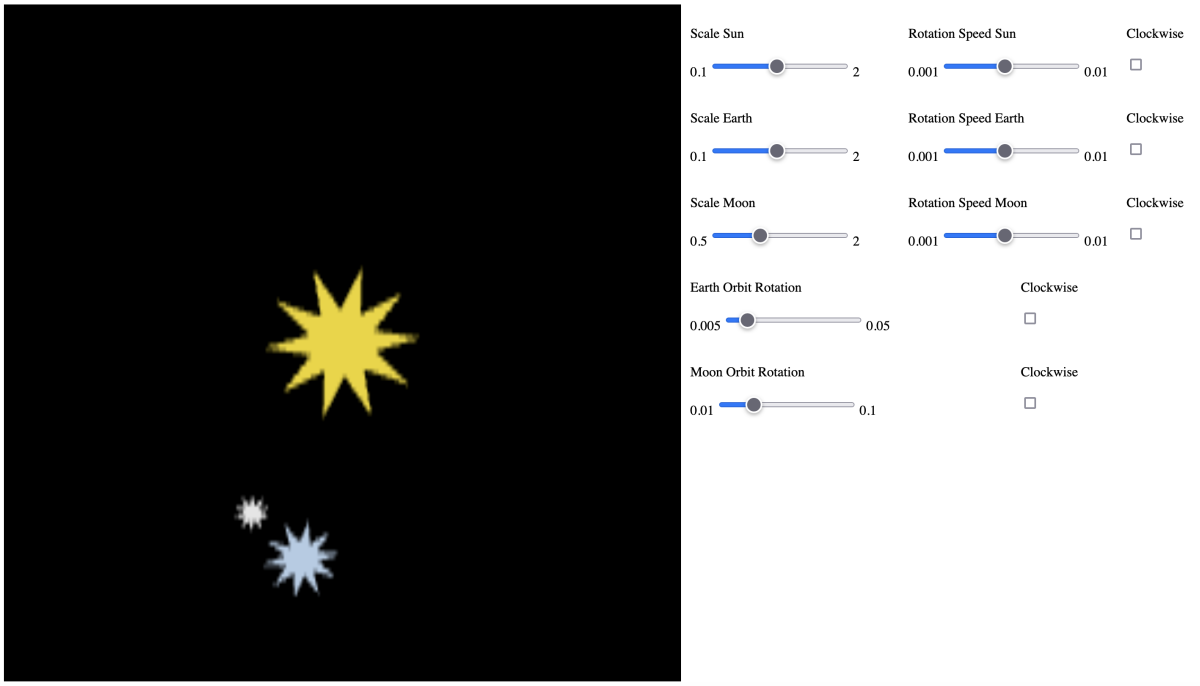

Figure 2: Snowflake centered in canvas.

2. You will be able to scale these stars with respect to the value from range objects.
3. You will be able to change the rotation speeds of the stars, as well as direction.
4. You will also be able to change orbit rotation speed and direction.

The Implementation Details

1. Implement your homework using **WebGL2**. All programming assignments must use the shader-based functionality of **WebGL2**: at least one vertex shader and one fragment shader.
2. The assignment must be original work. Turning in someone else's work, in whole or in part, as your own will be considered as a violation of academic integrity. Please note that the former condition also holds for the material found on the web as everything on the web has been written by someone else. **Detection of such plagiarism in a submission will automatically void the submission and establish grounds to trigger an official disciplinary investigation.** General discussion of the assignment among peers is allowed, but do not share answers, algorithms or source codes. **Also using other resources (example source code, book, webpage etc.) as a code and javascript libraries (except jquery, Angel's book) are not allowed.**
3. Do not write the scripts into the html file. Reference your scripts in html.
4. You should use Netbeans or Webstorm as IDE for your projects.

The Report

You will write a report on latex for this assignment. You will explain the code parts and algorithm for part 1 and part 2.

What to Hand In

You should submit entire Netbeans or Webstorm project directory including javascript files and html file in a zip file extracted from IDE. Submission file structure is as given in below:

- b<studentNumber>.zip

  |–Experiment3_2023
  |——Part 1**(The whole Netbeans or Webstorm project)**
  |——Part 2**(The whole Netbeans or Webstorm project)**
  |–report.pdf

Archieve this folder as **b<studentNumber>.zip** and send via Piazza Private Post.

Grading

The assignment will be graded out of 100:

- PART 1 - CODE:0 (no implementation)
  20 (correct solution).
- PART 2 - CODE: 0 (no implementation)
  60 (correct solution)
- REPORT: 20

Academic Integrity

All work on assignments must be done individually unless stated otherwise. You are encouraged to discuss with your classmates about the given assignments, but these discussions should be carried out in an abstract way. That is, discussions related to a particular solution to a specific problem (either in actual code or in the pseudocode) will not be tolerated. In short, turning in someone else's work, in whole or in part, as your own will be considered as a violation of academic integrity. Please note that the former condition also holds for the material found on the web as everything on the web has been written by someone else.

References

[1] `https://github.com/esangel/WebGL`