Homework #1:
Introduction to WebGL

Assigned: 03.03.2023 Due: 15.03.2023

1 Objective

The purpose of this initial homework is to make you ready for the upcoming assignments. In the assignments, you will use WebGL. Therefore, you should setup the necessary environment as soon as possible. You should also have some information about WebGL and how it works.

2 Specification

2.1 Getting Ready for the Course

Task 1 – Enable WebGL

WebGL runs on web browsers and you are free to use your favorite browser to run WebGL applications if it supports WebGL. Most of the modern browsers support WebGL, however you may need to take several actions to enable WebGL on your browser.

1. It is strongly recommended to update your web browser to the latest version first.
2. Open the link https://get.webgl.org/ in your web browser. You should see a rotating cube as in the below figure if your browser supports WebGL and it is enabled.

3. If you can see the rotating cube, then go to https://www.khronos.org/webgl/wiki/Demo_Repository and click on any test sample on the table. If your browser does not display an error message, this means that you can run WebGL applications on your browser.
4. If you cannot see the rotating cube in the first step or you get an error message in the second step, you have to perform several actions to enable WebGL on your browser, depending on the browser. See the following links to enable WebGL in your browser.

   https://www.khronos.org/webgl/wiki/Getting_a_WebGL_Implementation

   https://www.khronos.org/webgl/wiki/Main_Page

5. Note that you may need to restart your web browser after you change the settings.

6. Try steps 1 and 2 again to see whether you succeeded to enable WebGL.
7. After ensuring that you enabled WebGL on your browser, you can run the code samples accompanied in your textbook. You can find all the source codes of your textbook in [1]. If you are curious, you can start inspecting those codes.

Task 2 – JavaScript and HTML

Since WebGL is a JavaScript implementation, it is better for you to get familiar with JavaScript and HTML5. JavaScript is a large language, but we will not use it all, we will need only some portion. You can benefit from many online tutorials such as [7] to learn JavaScript basics. You are also assumed to be familiar with basic HTML tags.

2.2 Assignment

Task 3 – Modifying a WebGL Application

In this assignment, you are given sample codes in the ***assignment1*** file. Unzip the files. First read the README file. When you run the sample application, you should see a blue triangle as in Figure 1-a. Try to inspect the HTML and JavaScript codes. Then perform the following modifications (shown in Figure 1-b):

1. Write your name, surname, and student ID on top of the page. (**Hint:** You will perform this in .html page.)
2. Modify the color of the triangle to any color you want. (**Hint:** You will perform this in .html page.)
3. Change the coordinates of the vertices. (**Hint:** You will perform this in .js page. You don't need any transformations; you will just change the vertex coordinates.)

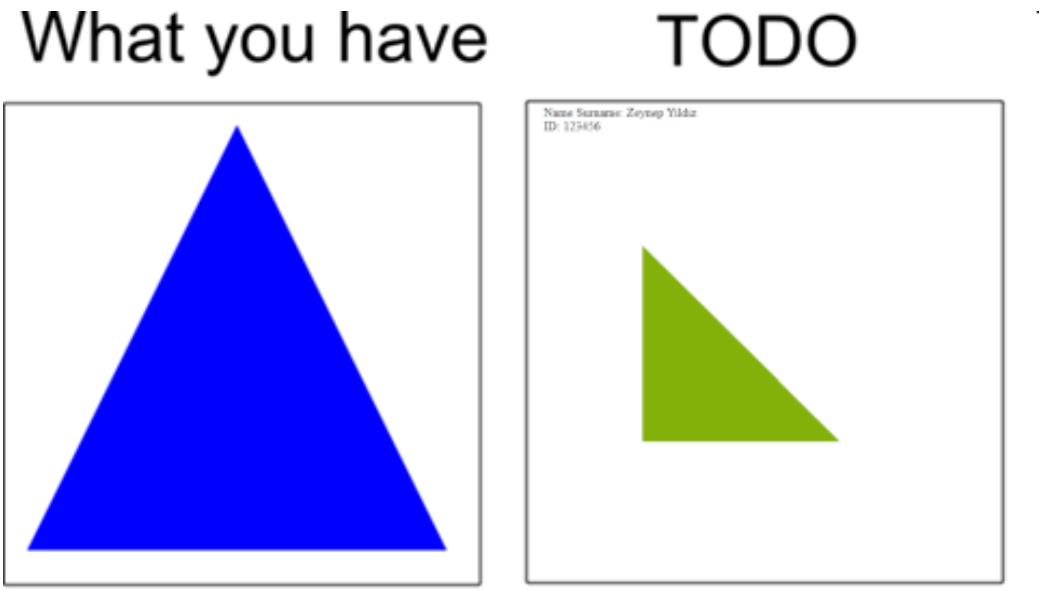

Figure 1: Left – You will see a blue triangle when you run the given WebGL application. Right – Modify the color and coordinates of the triangle as shown.

Task 4 – Inspecting your graphics card

Check your graphics card on your PC. Search the main features of your graphics processing unit from the vendor specifications and other online resources. Write a short report (about half or one page) explaining the specifications of your GPU.

3 Useful Links

[1] http://www.cs.unm.edu/~angel/WebGL/7E/

[2] www.opengl.org

[3] https://get.webgl.org/

[4] www.khronos.org/webgl

[5] www.chromeexperiments.com/webgl

[6] http://www.learningwebgl.com

[7] http://www.w3schools.com/js/

4 Submission

- This homework will be done **individually**.
- For Task 1 and 2, you will not submit anything.
- For Task 3, place all your source files (.html and .js) in a folder.
- For Task 4, save your report in pdf format.
- Place all your files in a zip archive with name **HW1_StudentID_Surname_Name.zip** and submit through the Teams submission module.
- If you have further questions, you can send me a message.

4.1 Late Submission Policy

Deadline for homework submissions is **23:59 pm** at the specified date. For each additional day, **25% cut-off** will be applied.

5 Grading

Grading will be done according to the following scheme:

- Name of the submitted file (5 pts)
- Name on the webpage (10 pts)
- Color modification (30 pts)
- Changing the coordinates of the triangle (30 pts)
- Report (25 pts)