Game-3111 Advanced Graphics Programming
Assignment #2

1. Introduction

In this assignment, you will be implementing everything we learned so far, in order to draw a city skyline in DirectX 12! This is a continuation of the assignment1!

2. Overview

City Skylines have always been designed using simple geometrical shapes. A skyline usually consists of some building, a tower, and a sport arena facing a lake.

3. Logistics

For this assignment you are going to work in a group of **TWO** students. This group would be your work group for all assignments this semester (Choose Wisely). There are multiple deadlines and multiple submissions for this assignment so make sure you are aware of them. All submissions for this assignment are electronics. Only one submission is required for the whole group, make sure that all names are included in the submission.

4. Deliverables & Deadlines

Parts 1, 2, 3, & 4 before Friday the 20h of March 2020.

5. What you need to do

Group names and IDs

Pick your teammate wisely.

Part 1: Texturing

You are going to expand on your previous Assignment submission. This time, you need to apply some textures to each of your objects. First off you
need to start thinking about what each of your objects represent as well as what this object would be made of.

• Buildings could be made of wood, metal, marble, etc.
• Tower/Dome could be made of wood, stones, metal, etc.
Get creative and decide how you want your final city skyline to look like.
You can head on to http://opengameart.org in order to download some textures you can use.

Part 2: Lighting

We discussed how to implement a light source, we also changed the light source color in one of the labs. You would need to implement multiple light sources to your project, give them any color you think would match your scene style. At least 2 types of light sources are to be implemented.
Example:
Red point light on the Rogers Center dome or CN Tower (representing Raptors winning maybe?).
Yellowish parallel light for the full scene.

Part 3: Water

In week 6, we discuss blending. And one of the examples of blending was implementing transparency (eg. water). Implement a water plan around your city.

Part 4: Trees

In week 8 we discuss the geometry shader and how it can be used to draw trees using billboards. You are going to draw a few trees around your city using billboards on the geometry shader. A template project is provided, titled “TreeBillboards”. Use this project to get an idea of how trees can be implemented as billboards using the geometry shader.

6. To Hand In

You must demo your work to me in the lab and you also need to email me your work (the same way you did for assignment 1). Please place all the files in a folder named “student ids – lab assignment 2 ”. Afterwards, compress the folder and place it in the google drive and email me the link at Hooman.Salamat@georgebrown.ca

7. Evaluation

This assignment will be graded using the following rubric. It is advisable to review this rubric before submitting your work.

Part 1 (4 points in total):

- Your code shows all your objects and the material/texture each object is using.
- Your code clearly shows the city with all the objects used to construct it.
- Your code to implement texturing is clear and well commented.

Part 2 (4 points in total):

- Your code to implement lighting is clear and well commented.
- Your code clearly shows the city skyline with textures and lit using your light sources.

Part 3 (4 points in total):

- Your code clearly shows the city facing the water (Lake Ontario).
- Your code to implement water is clear and well commented.

Part 4 (3 points in total):

- Your code clearly shows the city with trees around it.
- Your code to implement the trees used billboards in the geometry shader and is clear and well commented.