Game-3111 Advanced Graphics Programming
Assignment #1

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1. Introduction

In this assignment, you will be implementing everything we learned so far in order to draw a castle in DirectX.

2. Overview

Castles have always been designed using simple geometrical shapes. A castle usually consists of at least 4 main towers in the corner with walls connecting each tower. There usually is one or more gates/entrances to the castle.

3. Logistics

For this assignment you are 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

Deliverable	Deadline
Parts 1, 2, & 3	Before midnight on Tuesday the 23rd of October 2018
Group member assessment	Before midnight on Tuesday the 23rd of October 2018

5. What you need to do

Group names and IDs

1- Pick your teammate wisely.
2- Pick an awesome group name!
You need to register a group on blackboard, send me a DM on slack with the group number, desired group name, and the team members.

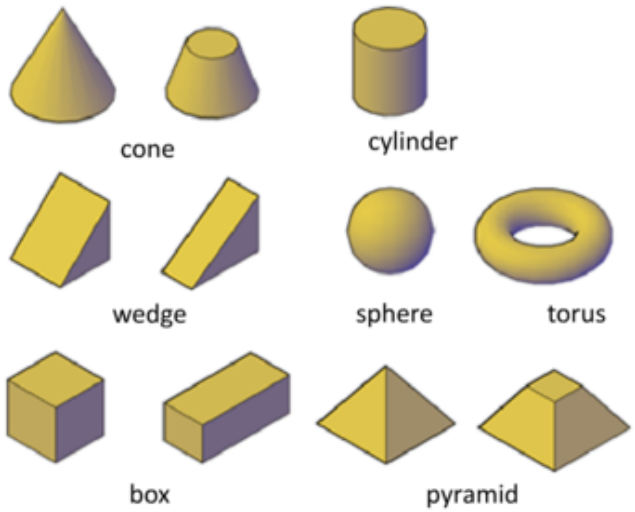
Part 1: Generating Primitives

The framework provided has a GeometryGenerator class that already has implementations for the following primitives:

- Box
- Cylinder
- Sphere
- GeoSphere
- Grid
- Quad

You are to expand on this class and implement functions that would generate 6 new primitives, you can implement the following primitives or different primitives that you might want to use in your castle design.

- Cone
- Wedge
- Torus
- Pyramid
- Diamond
- Triangular Prism



A certain primitive can be modified to create a new primitive. Refer to the image on the right for an example. (A cube can be a cuboid using the same function)

Deliverables:

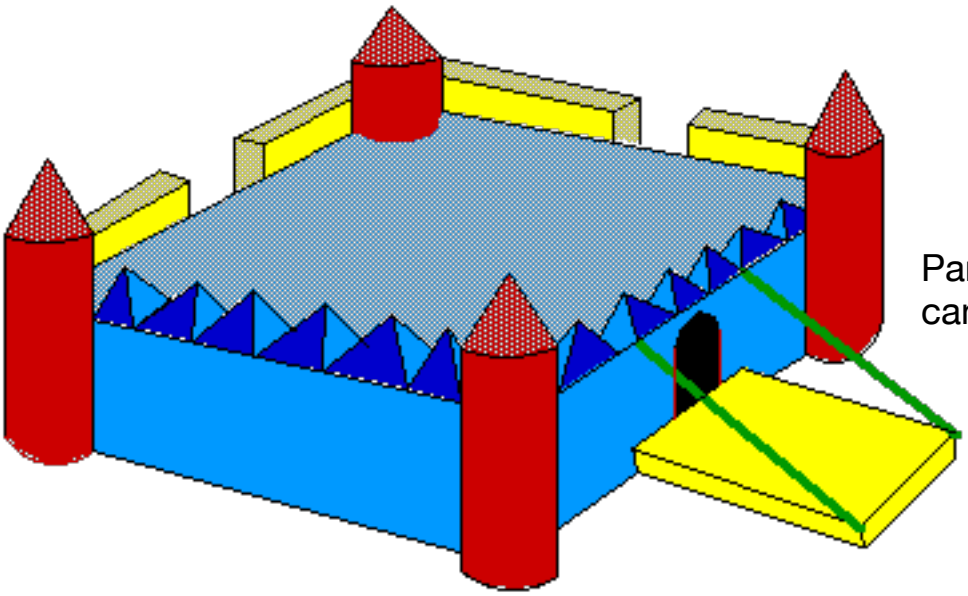
A modified Geometry Generator class that implements the primitives discussed above.

Expected timeline:

Don't spend more than 3-4 days working on this part.

Points allocated:

40% of this assignment's grade.



Pardon this $#*! castle, I know you can design better!

Part 2: Castle Design

With your teammate, start sketching out how your castle will look like. Make sure to use geometric primitives that the geometry generator class can generate when designing your castle. Label each of the objects that creates your castle.

After sketching out the castle, think about where each labeled object is placed in terms of world coordinates. Write down a list of all the objects in your castle with coordinates of where each object should be placed in the world.

Deliverables:

- A sketch of what your castle will look like. Could be hand sketched, on paint, photoshop, 3D modelling program, or whatever format you prefer. :) (I recommend using google sketchup)

- A document that lists all the objects in your castle with the locations of each object in world coordinates.

Expected timeline:

Don't spend more than 1 day working on this part.

Points allocated:

20% of this assignment's grade.

Part 3: Drawing your Castle

Using the framework and your modified geometry generator, start drawing your castle by modifying the ShapesApp.cpp file. This is similar to what we did in Lab #4 (drawing the diamond on the screen), but with more objects!

Deliverables:
A modified ShapesApp.cpp
Expected timeline:
Don't spend more than 3-5 days working on this part.
Points allocated:
40% of this assignment's grade.

Group Member Assessment

Fill out the questionnaire on blackboard for each of your team members.

6. To Hand In

Put the documents in a folder named "Docs" and place it in the frameworks' folder. Afterwards, compress the folder and upload it to blackboard. Make sure to include the team name in the submission.

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 primitives are created correctly. (0.5 points/primitive awarded)
- Your primitive functions are simple to understand and include appropriate comments. (0.5 points/three primitives awarded)

Part 2 (2 points in total):
- Your castle sketch is clear and illustrates all the different objects involved in building your castle. (1.0 point awarded)
- The locations of the objects in the document are correct. (0.5 points awarded)
- The document is clearly formatted and structured. The file is divided in a way that allows the reader to understand where each object is in the castle and where each object is located in the world. (0.5 points awarded)

Part 3 (4 points in total):

- Each object in the castle is rendered correctly (according to the designed sketch). (4.0 points awarded)
- Objects are rendered correctly but out of place. (3.0 points awarded)
- Not all objects (at least 50% of the objects) are rendered, but the rendered objects are correctly in place. (2.0 points awarded)
- Not all objects (less than 50% of the objects) are rendered, and/or they are rendered out of place. (1.0 points awarded)