XBGT2064 GRAPHICS PROGRAMMING

Semester 2214 (Sep2023)

Exercise 2 (15%)

INSTRUCTIONS

1. Download xbgt2064_ex2.zip.
2. Unzip to directory of your liking.
3. Open the project using Visual Studio 2022.
4. Do your C++ work in scene_ex2.h and any other files you add.

BRIEF

Decide on a setting and compose a scene. The MINIMUM SIZE of the scene is 4 × 4 × 4 unit (XYZ). It can be wider or taller if you wish. Setting examples: Your room, A playground, A farm under alien attack, A car park.

Your scene **MUST** have large objects and small objects (see notes #1 and #2 on the next page). **The objects MUST be rendered with texture applied.** The objects in the scene **MUST** be consistent with the setting in mind, i.e., Don't put a shark in a car park.

As for the number of objects, follow these rules:
- You have 15 coins.
- You can overspend coins, BUT NOT underspend.
- A unique large object is worth 4 coins.
- A unique small object is worth 2 coins.
- A variant of an existing object is worth 1 coin.
  - A variant means reusing mostly the same vertices with small changes, and/or applying different texture on the model.
- You CANNOT make a scene consisting of only large objects OR only small objects.

NOTES

1. <mark>**The unit of measurement IS TYPICALLY IN metres, BUT NOT NECESSARILY**</mark>, e.g., for a scaled-down park, 1 unit could represent 10 metres.
2. Large and small objects are relative to the scale of your scene:
   - Miniature town: large objects are house, water tank; small objects are car, tree.
   - Car park: large objects are car, arm barrier; small objects are cone, parking post.
3. <mark>You **MUST** make use of Transformation, not hard-code object position via vertex specification.</mark>
4. <mark>Objects need to have texture(s) applied.</mark>
   - <mark>**MAKE SURE YOUR IMAGE FILE SIZES ARE <1MB EACH. Use JPEG, not PNG.**</mark>
   - <mark>**IF YOUR IMAGE DIMENSION IS BIGGER THAN 1024x1024, RESIZE THE IMAGE.**</mark>
5. Objects with surfaces are to be modelled using **GL_TRIANGLES**, **GL_TRIANGLE_FAN** or **GL_TRIANGLE_STRIP** primitive type.
6. You are **NOT ALLOWED** to use the chair and table from xbgt2064_t3. Recreate it.
7. **Only model the parts of objects THAT CAN BE SEEN!**
   - If you are modelling a car, no need to model the interior if it cannot be seen.
   - If you are modelling a shelf that is leaning on a wall, no need to model the backside.
   - This is acceptable "cheating", do not waste time on something that will never be displayed.
8. Make use of the shapes you have made in Exercise 1!
9. Make use of custom struct/classes to help structure your project better!

> **You are PROHIBITED from using OpenGL Utility Library (GLU)**
> You will get 0 marks if you use GLU API.

SCENE COMPOSITION RUBRIC (12%)

Variety of objects that make sense given the setting.
Objects are all textured nicely.
Great usage of UV.
Some objects with continuous animation (such as fan blade spinning)
Codes are neatly formatted and self-documenting (e.g., variable names tell what it does)
Great use of class/struct to manage project.
Transformations using matrix multiplication.

PROJECT QUALITY (3%)

This is related to your work quality, examples of such are:
- Consistent naming convention.
- Proper code indentation.
- <mark>Good project structuring (e.g., split code to different file/classes)</mark>
- Comments explaining necessary parts, not obvious ones.
- No unused lines of codes (including commented out codes).
- Practising good programming principles:
   - Don't repeat yourself (DRY)
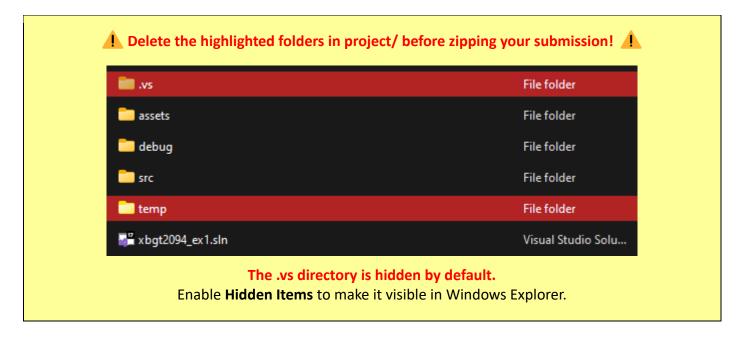   - Keep it simple, stupid (KISS)
   - Single responsibility

SUBMISSION INSTRUCTIONS

ARCHIVING

Name your zip archive following this format: STUDENTID_XBGT2064_EX2
  e.g., 0120123_XBGT2064_EX2.zip

Your zip archive should contain:
1. deps/ folder.
2. project/ folder.
   a. **Include a prebuilt executable in project/debug/ folder.**
3. Documentation or readme, if any.

⚠️ **Delete the highlighted folders in project/ before zipping your submission!** ⚠️

📁 .vs	File folder
📁 assets	File folder
📁 debug	File folder
📁 src	File folder
📁 temp	File folder
🗔 xbgt2094_ex1.sln	Visual Studio Solu...

The .vs directory is hidden by default.
Enable **Hidden Items** to make it visible in Windows Explorer.

SUBMITTING

Email your submission **USING your @student.uow.edu.my** email.

Attach the zip archive directly to the email if possible. If the zip archive size is too big, share via OneDrive instead.

Email your work at faris.z@uow.edu.my following the title format: XBGT2064_EX2_STUDENTID
  e.g., XBGT2064_EX2_0120123

NOTE:
It is your responsibility to check if your submission email goes through.
If your email is rejected/blocked for any reason, it is your responsibility to rectify it.

DUE DATE: 3 NOVEMBER 2023 11:59:59PM