

# COMP 371 Computer Graphics

## Assignment 3

### Summer 2024

The objective of this assignment is to create a detailed 3D model of a travelling mug in Blender. Then you need to import the model to OpenGL. Use the same keyboard keys you used in assignment 2 to apply scaling, translation and rotation. When you rotate, the model should rotate while staying in its place on the screen.

This assignment must be done in a group of a **minimum 2 and a maximum 4**.

**Due date:** as indicated on Moodle.

Here is the mug we need to model: [https://www.amazon.ca/Contigo-Stainless-Travel-Leak-Proof-Vacuum-Insulated/dp/B0C6V71HG8/ref=asc\\_df\\_B0C6V71HG8/?tag=googleshopc0c-20&linkCode=df0&hvadid=578933705651&hvpos=&hvnetw=g&hvrnd=12667942448551940852&hvptwo=&hvqmt=&hvdev=c&hvdvcmld=&hvlocint=&hvlocphy=9000571&hvtargid=pla-2246438025513&mcid=f4c970f3bdac3a9fa22d508a92177302&th=1](https://www.amazon.ca/Contigo-Stainless-Travel-Leak-Proof-Vacuum-Insulated/dp/B0C6V71HG8/ref=asc_df_B0C6V71HG8/?tag=googleshopc0c-20&linkCode=df0&hvadid=578933705651&hvpos=&hvnetw=g&hvrnd=12667942448551940852&hvptwo=&hvqmt=&hvdev=c&hvdvcmld=&hvlocint=&hvlocphy=9000571&hvtargid=pla-2246438025513&mcid=f4c970f3bdac3a9fa22d508a92177302&th=1)

#### Requirements:

- Use blend to model an object.
- Set up an OpenGL window using GLFW and GLEW.
- Apply transformations (translation, rotation, and scaling) to the shape.
- Use keyboard input to control the transformations.

#### Tools:

- Blender
- C++
- GLFW (for window management and input)
- GLEW (for loading OpenGL functions)
- GLM



## Steps:

### Base Mesh Creation:

- Start with a cylinder for the mug body.
- Add another cylinder for the lid and adjust its shape to fit the mug.
- Use basic extrusion and scaling to create the spout.

### Detailing:

- Add any grip patterns or brand logos using texture maps or sculpting tools.
- Refine the spout for a realistic look.

### Texturing:

- UV unwrap the model to ensure textures apply correctly.
- Create or find textures for the materials (e.g., brushed metal for stainless steel, matte or glossy plastic).

### Lighting and Rendering:

- Set up a simple lighting scene to showcase the mug.

**Make sure to take many screen shots in each step and put them in a pdf file. The purpose is to show the steps you have done in modeling the mug.**

### Export to OpenGL:

- Export an OBJ file from blender.
- Import the OBJ file to OpenGL.
- Use OpenGL to scale, rotate, and translate the travel mug.
- A wireframe in OpenGL is **ALL** what is needed: no texture is required

### Grading:

- The blender model 50%
  - Accuracy of the model 25%
  - Texture 15%
  - Lighting scene 10%
- OpenGL program 50%
  - Properly importing the OBJ file 25%
  - The display and the transformations of the mug 25%

**Demos:**

- A demo will be given to a TA. No credit will be given without the demo.
- Double booking demo slots will result in a 30% deduction. Only one demo slot per group.
- Missing your demo time will result in a 30% deduction of your mark.
- All team members must be present during the demo.
- During the demo, the TA may ask a specific student a specific question. Only that student needs to answer the question. Different grades may be given to different students based on their knowledge of the code and the different functionalities of the OpenGL function and the use of Blender.
- Every student is responsible for the whole assignment. Do not say, I did not do this part. You should be aware of all parts of the project.

**Submission:**

On Moodle, you need to submit:

- The .blend file for your model
- The OBJ file
- The blender.pdf file that has screenshots of your modeling steps
- The OpenGLRun.pdf that has screenshots of your OpenGL output.
- A zip that contains the whole OpenGL C++ project. You need to go to the root folder of the project, right click, send to zipped folder. This will create a zip that contains all the files and folders used by Visual C++ project. Then upload the zip.
- ***A report on who has done what. This report must list all the tasks that have been performed by each group member.***

Only **one submission per group**. Make sure to write the names and ID numbers of all team members on all submitted documents.

**Have fun** 😊