Computer Graphics 4052
Lab 0

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Before programming with OpenGL, you might want to setup your environment. Depending on your operating system, the steps for setting up can be quite different. This document provides instructions to setup the environment for Windows, Linux, and Mac OS.

If this does not work for you, please try to search for a solution from Google, ask specific questions on the discussion board on Blackboard, or email your demonstrators.

It is recommended that you keep this environment for use throughout this module. Switching to a new PC or laptop might be sometimes not avoidable but this might require you to do the setup again.

In common platforms such as Windows, Linux, Mac OS, OpenGL is already integrated with the system. You just need to ensure that a recent driver for your graphics hardware is properly installed (e.g., NVIDIA, AMD, or Intel graphics driver). This will give you hardware accelerated graphics rendering.

Windows

Download Visual Studio or CLion. Follow the compilation instructions in Lab 1.

Ubuntu

In Ubuntu, you can execute the following commands to install the dependencies for developing OpenGL applications:

```
$ sudo apt-get update
$ sudo apt-get install cmake pkg-config
$ sudo apt-get install mesa-utils libglu1-mesa-dev mesa-common-dev
```

Then follow the compilation instructions in Lab 1.

macOS

Credit: This instruction is adapted from CSU44052 2023-2024.

1. Install Xcode

A default Mac OS does not include necessary OpenGL headers or development tools. It is necessary to install Xcode, a separate package for developers that include an IDE, compilers as well as OpenGL headers.

You can install Xcode by entering the following command in the terminal:

$ xcode-select --install

2. Install Homebrew
Homebrew is a package manager for macOS. If you have installed Homebrew before, skip this step.

To install Homebrew, simply paste the command from https://brew.sh into your terminal and execute it.

Once you have installed Homebrew, type “brew” in your terminal to check the installation. We will use Homebrew to install CMake.

3. Install CMake
It is strongly suggested to install CMake via Homebrew as it will also pick up any related missing packages during installation (such as installing a needed command line tool for Xcode even if you don’t have Xcode). If you have installed CMake, just skip this step.

To install CMake, simply type “brew install cmake” in the terminal. Once you have installed CMake, type “cmake --version” in your terminal to check if it’s installed.

Then build and run your OpenGL program by following the instructions in Lab 1.

Dependencies

To avoid the hassle of external dependencies and libraries linking that can be sometimes tricky, the labs are designed such that all external libraries required will be included and compiled from source.

By default, these necessary libraries will be compiled and linked to your OpenGL program using CMake. This includes GLFW and GLM.