IDIG4002 - Computer Graphics Fundamentals and Applications

Lab 1: Exercise 2.

OpenGL setup with GLFW and GLEW

For Windows System

We will be using visual studio 2017/2019

Download Important Libraries

- GLFW 64/32 bit (depending on the platform you want to support) pre-built binaries: https://www.glfw.org/download.html
- GLEW 64/32 bit (depending on the platform you want to support) pre-built binaries: http://glew.sourceforge.net/

Static Linking

- Create a new visual studio C++ project – Empty project
    - Use your preferred location (plocation) and project name (pname)
    - In your project folder(at plocation), create a new folder for your source files (src) and dependencies (Dependency) :
        - right click on the project solution name
        - choose Add -> New Folder
    - In your src folder, Add -> New Item -> C++ file
- Linking the libraries
    - Create GLFW and GLEW folders in the projects Dependencies folder
    - Go to the downloaded GLFW/GLEW pre-built binary folders
    - Copy the include and lib folders (lib-vc2017 or 2019 for GLFW)
    - Paste them in their corresponding Dependencies folders.
    - Open your project property page:
        - Right click on the project solution name -> properties
    - For all configurations and your chosen platform, add additional include directories
        - go to C/C++ -> General setting -> Additional Include Directories
        - add the path to the GLFW and GLEW include files.
            $(SourceDir)Dependencies\GLFW\include;
            $(SourceDir)Dependencies\GLEW\include
        - go to C/C++ -> Preprocessors -> Preprocessor definitions and add GLEW_STATIC
    - For all configurations and your chosen platform, add linkers for your libraries
        - Go to Linkers -> General -> Additional Library Directories
        - Add the path to your libraries

$(SourceDir)Dependencies\GLFW\lib-vc2017 or 2019;
$(SourceDir)Dependencies\GLEW\lib\Release\Win32 or x64

- Go to input -> include the libraries in the Additional Dependencies section.
  glfw3.lib;opengl32.lib;glew32s.lib

Dynamic Linking with CMake

- Go to local disk and create a folder named OpenGL
- Copy and pest the GLEW and GLFW binary folders in the C:/OpenGL folder.
- Add new system variables:
  - windows environment variables -> System variables -> New
    Variable name: GLEW_INCLUDE_DIR
    Variable value: C:\OpenGL\GLEW\include
    Variable name: GLEW_LIBRARY
    Variable value: C:\OpenGL\GLEW\lib\Release\Win32 or x64

    Variable name: GLFW_INCLUDE_DIR
    Variable value: C:\OpenGL\GLFW\include
    Variable name: GLFW_LIBRARY
    Variable value: C:\OpenGL\GLFW\lib-vc2017 or 2019
- Add the path to the dynamic linking library files, glew32 or 64.dll and glfw3.dll.
  - windows environment variables -> System variables -> Path -> New
    C:\OpenGL\GLEW\bin\Release\win32
    C:\OpenGL\GLFW\lib-vc2017 or 2019
- For the environment variable setting to work, restarting your machine is required.

- Create OpenGL project and use CMake to link GLEW, GLFW, and opengl libraries.
  - Open Visual Studio with empty folder as your working directory, let us assume you named the folder OpenGLSample
  - Add new file in the working directory:
    - Right click on OpenGLSample -> Add -> New file -> name the file main.cpp
    - Copy and pest the provided main.cpp code
    - Right click on OpenGLSample -> Add -> New file -> name the file CMakeLists.txt
    - Copy and pest the provided CMakeLists.txt content into the file
    - Adjust the CMake configuration and build the project
- The project is now ready to compile and run.
- To know more about CMake in visual studio, read the Microsoft documentation: https://docs.microsoft.com/en-us/cpp/build/cmake-projects-in-visual-studio?view=vs-2019

For Linux System –

This instruction should work on recent Debian-based systems. For other distributions, try to find the appropriate name of the packages in your package manager.

1. Install the libraries

>> apt install libglfw3 libglfw3-dev mesa-common-dev libglew-dev

2. Create and copy your application (=main.cpp=)

>> g++ main.cpp -o lab01 -lGL -lGLEW -lglfw