

Instruction for Programming Assignment

2020 COMPUTER GRAPHICS

A solid orange horizontal bar at the bottom of the slide.

Information

- Grading : 40 % (no mid-term exam)
- Total number of PAs: 4
 - All PAs will be handled by using Github Classroom
 - Sub-materials (ppt, demo) for PAs will be given in class web-site (<https://cglab.gist.ac.kr/courses.html>)
- * PA 1 will be uploaded in 23 March (Mon)

Github Classroom

1. Create and Log in to your GitHub account. (You must log in with your github account)
2. Open the link which I will send it to you.
3. Accept permission required by GitHub Classroom, then click the accept button
4. Create your private repository. Use it for PA.

Submission

- you **must** do two things.
 1. You should push your commit in your own assignment repository before deadline.
 2. You should comment the last commit (before deadline) id (SHA-1 hash) in Github Issue board.
(will be explained with first PA in detailed)
- The last commit **BEFORE** deadline will be considered as submitted assignment.
 - Timestamp in your commit (local time) will be ignored. (I will use Github server timestamp instead)

Submission

- Email submission will not be accepted.
- The submission deadline will be controlled by github classroom.
 - system **CANNOT** accept your PA after the deadline.
- You should not commit/push binaries or other build related files.
- Every PA you should write small report in markdown (report.md).
 - Only your name, student id, result images.
- Do **not** make your **public** repository.

Prerequisite

- You need to install four ingredients

1. Visual studio (or your favorite ide/editor)

2. Cmake

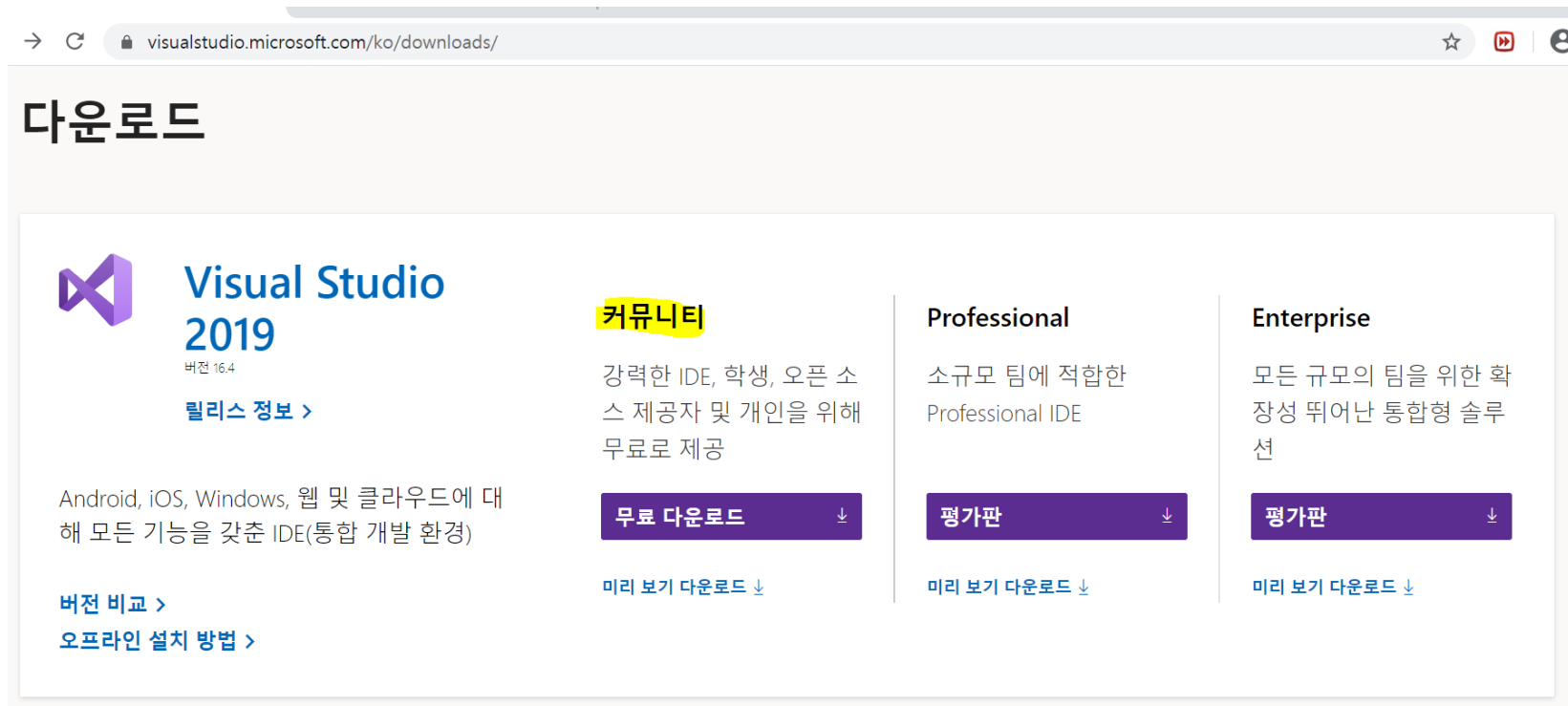
3. Git

4. GitKraken

* Github account

Installation of Visual Studio


<https://visualstudio.microsoft.com/ko/downloads/>



The screenshot shows the Visual Studio 2019 download page in Korean. The browser address bar shows the URL visualstudio.microsoft.com/ko/downloads/. The page title is "다운로드" (Download). The main content area features the Visual Studio 2019 logo and version information (버전 16.4). Below the logo, there are links for "릴리스 정보 >" (Release info >), "버전 비교 >" (Compare versions >), and "오프라인 설치 방법 >" (Offline installation method >). The page is divided into three columns for different editions: "커뮤니티" (Community), "Professional", and "Enterprise". Each column includes a description of the edition, a "평가판" (Evaluation) button, and a "무료 다운로드" (Free download) button. The "커뮤니티" column also has a "미리 보기 다운로드 >" (Preview download >) link.

→ visualstudio.microsoft.com/ko/downloads/

다운로드

 **Visual Studio 2019**
버전 16.4
[릴리스 정보 >](#)

Android, iOS, Windows, 웹 및 클라우드에 대해 모든 기능을 갖춘 IDE(통합 개발 환경)

[버전 비교 >](#)
[오프라인 설치 방법 >](#)

커뮤니티
강력한 IDE, 학생, 오픈 소스 제공자 및 개인을 위해 무료로 제공

[무료 다운로드](#) ↓
[미리 보기 다운로드 >](#)

Professional
소규모 팀에 적합한 Professional IDE

[평가판](#) ↓
[미리 보기 다운로드 >](#)

Enterprise
모든 규모의 팀을 위한 확장성 뛰어난 통합형 솔루션

[평가판](#) ↓
[미리 보기 다운로드 >](#)

Installation of Cmake

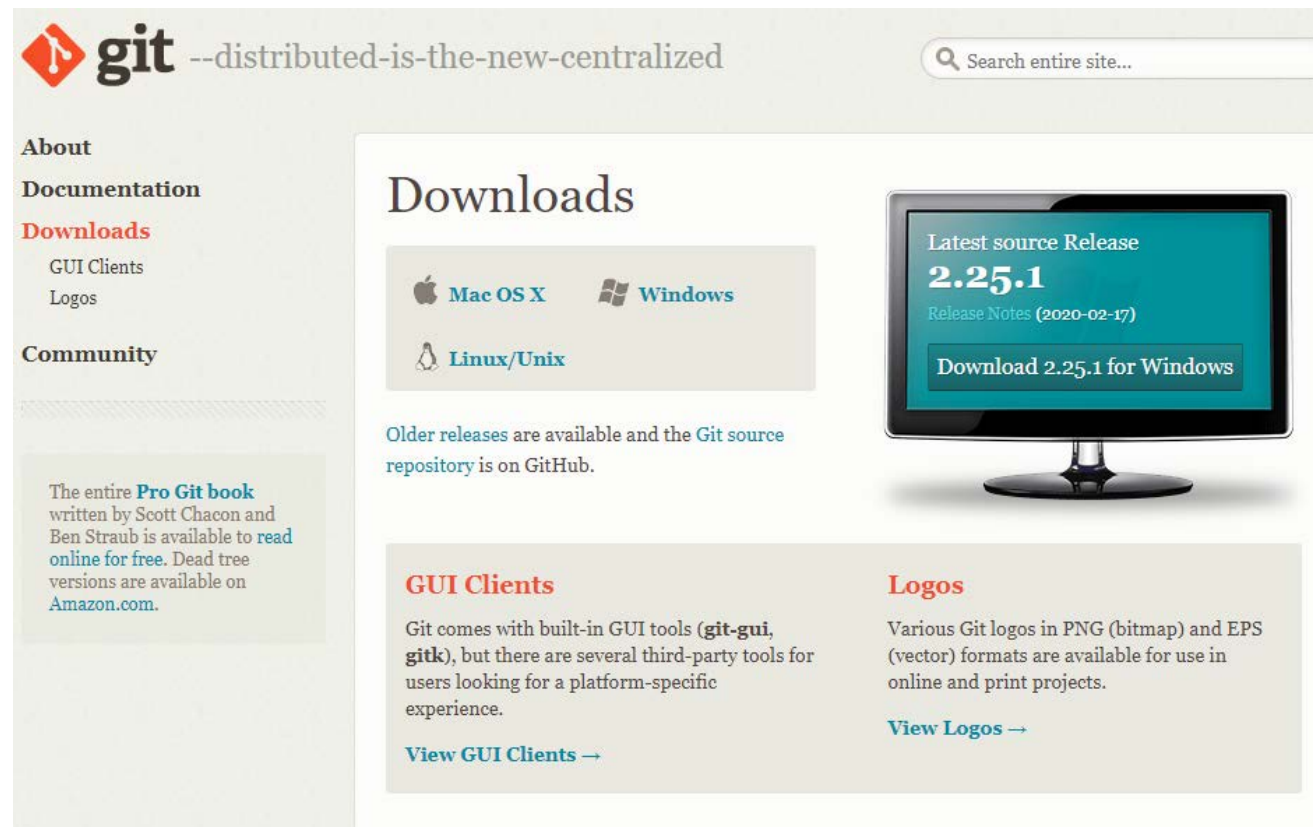
<https://cmake.org/download/>

Binary distributions:

Platform	Files
Windows win64-x64 Installer: Installer tool has changed. Uninstall CMake 3.4 or lower first!	cmake-3.17.0-rc2-win64-x64.msi
Windows win64-x64 ZIP	cmake-3.17.0-rc2-win64-x64.zip
Windows win32-x86 Installer: Installer tool has changed. Uninstall CMake 3.4 or lower first!	cmake-3.17.0-rc2-win32-x86.msi
Windows win32-x86 ZIP	cmake-3.17.0-rc2-win32-x86.zip
Mac OS X 10.7 or later	cmake-3.17.0-rc2-Darwin-x86_64.dmg
	cmake-3.17.0-rc2-Darwin-x86_64.tar.gz
Linux x86_64	cmake-3.17.0-rc2-Linux-x86_64.sh
	cmake-3.17.0-rc2-Linux-x86_64.tar.gz

Installation of Git

<https://git-scm.com/downloads>



The screenshot shows the Git website's Downloads page. At the top left is the Git logo and the tagline "--distributed-is-the-new-centralized". A search bar is located at the top right. The left sidebar contains navigation links for "About", "Documentation", "Downloads" (highlighted in red), "GUI Clients", "Logos", and "Community". Below the sidebar is a text box mentioning the "Pro Git book" by Scott Chacon and Ben Straub. The main content area features a "Downloads" heading, a platform selection box with icons for Mac OS X, Windows, and Linux/Unix, and a monitor graphic displaying the "Latest source Release 2.25.1" with a "Download 2.25.1 for Windows" button. Below this, there are sections for "GUI Clients" and "Logos", each with descriptive text and a "View" link.

git --distributed-is-the-new-centralized

Search entire site...

About
Documentation
Downloads
GUI Clients
Logos
Community

The entire **Pro Git book** written by Scott Chacon and Ben Straub is available to [read online for free](#). Dead tree versions are available on [Amazon.com](#).

Downloads

Mac OS X Windows
Linux/Unix

Latest source Release
2.25.1
Release Notes (2020-02-17)
Download 2.25.1 for Windows

Older releases are available and the Git source repository is on GitHub.

GUI Clients

Git comes with built-in GUI tools (**git-gui**, **gitk**), but there are several third-party tools for users looking for a platform-specific experience.
[View GUI Clients →](#)

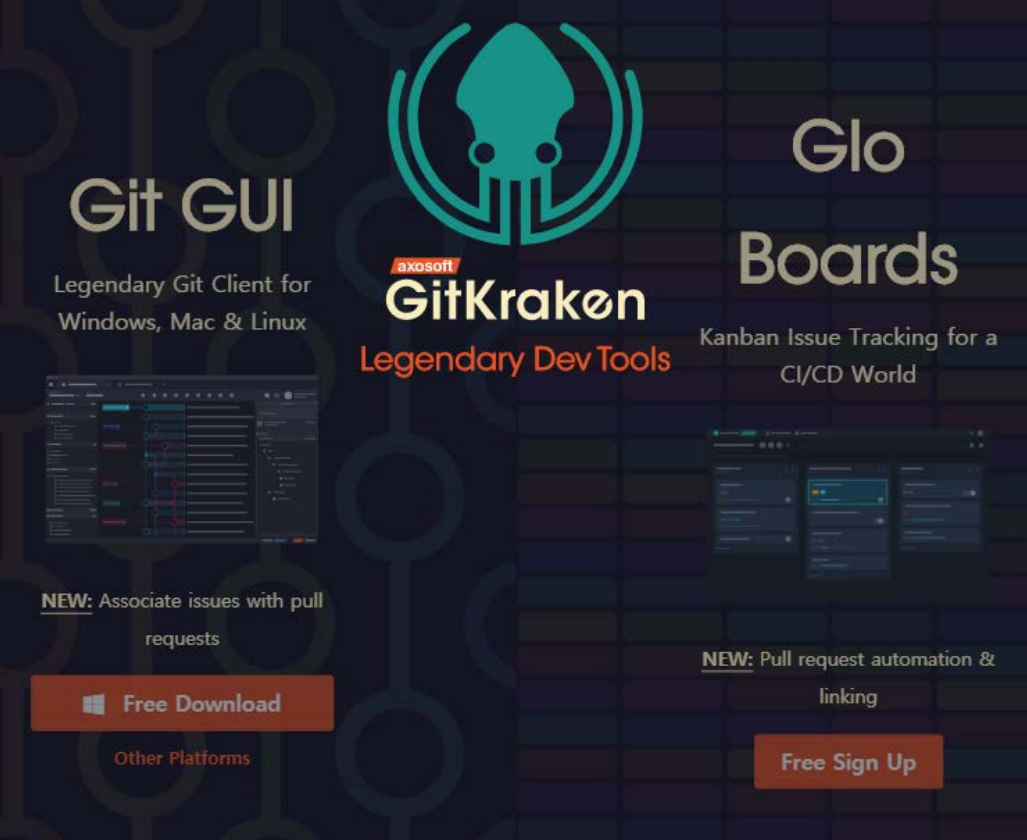
Logos

Various Git logos in PNG (bitmap) and EPS (vector) formats are available for use in online and print projects.
[View Logos →](#)

Installation of GitKraken

<https://www.gitkraken.com/>

- Easy Git GUI client
 - If you want to use other things, go ahead and make sure that you must connect your github ID with GitKraken



The image is a promotional banner for GitKraken, featuring a dark blue background with a pattern of light blue circles and lines. The central focus is the GitKraken logo, a teal octopus head inside a circle, with the text "axosoft GitKraken" and "Legendary Dev Tools" below it. To the left, the "Git GUI" logo is displayed, with the text "Legendary Git Client for Windows, Mac & Linux" and a screenshot of the application interface. Below this is a "Free Download" button with a Windows logo icon and a link to "Other Platforms". To the right, the "Glo Boards" logo is shown, with the text "Kanban Issue Tracking for a CI/CD World" and a screenshot of the application interface. Below this is a "Free Sign Up" button. Two "NEW" announcements are present: "Associate issues with pull requests" and "Pull request automation & linking".

Git GUI
Legendary Git Client for Windows, Mac & Linux

axosoft GitKraken
Legendary Dev Tools

Glo Boards
Kanban Issue Tracking for a CI/CD World

NEW: Associate issues with pull requests

NEW: Pull request automation & linking

Free Download
Other Platforms

Free Sign Up

Set SSH for GitKraken

If you don't do this, you cannot push your commit.

1. Go to preference
2. Go to authentication
3. Generate SSH key and add to github

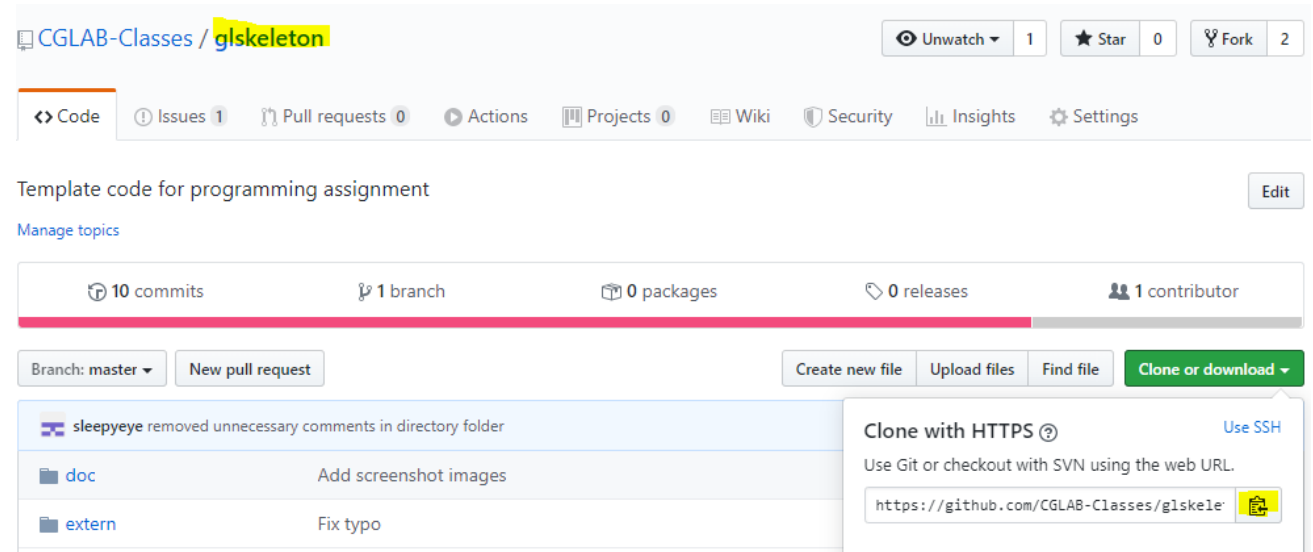
Clone the skeleton

* The skeleton code for PA1, 2 and 3:

<https://github.com/CGLAB-Classes/glskeleton#for-windows-user>

- Example in GitKraken

1. Set your local folder
2. Copy and paste the repository URL
3. Clone it!



The screenshot shows the GitHub repository page for CGLAB-Classes/glskeleton. The repository is described as 'Template code for programming assignment'. It has 10 commits, 1 branch, 0 packages, 0 releases, and 1 contributor. The 'Clone or download' button is highlighted, and a dropdown menu is open, showing the 'Clone with HTTPS' option with the URL `https://github.com/CGLAB-Classes/glskeleton`.

* Git Kraken will automatically ask that you want to initialize submodules – CLICK **YES**

How to Build? – Short Version

- For windows user
 - <https://github.com/CGLAB-Classes/glskeleton#for-windows-user>
- For linux user
 - <https://github.com/CGLAB-Classes/glskeleton#for-linux-user> For mac user
- Currently mac is not supported

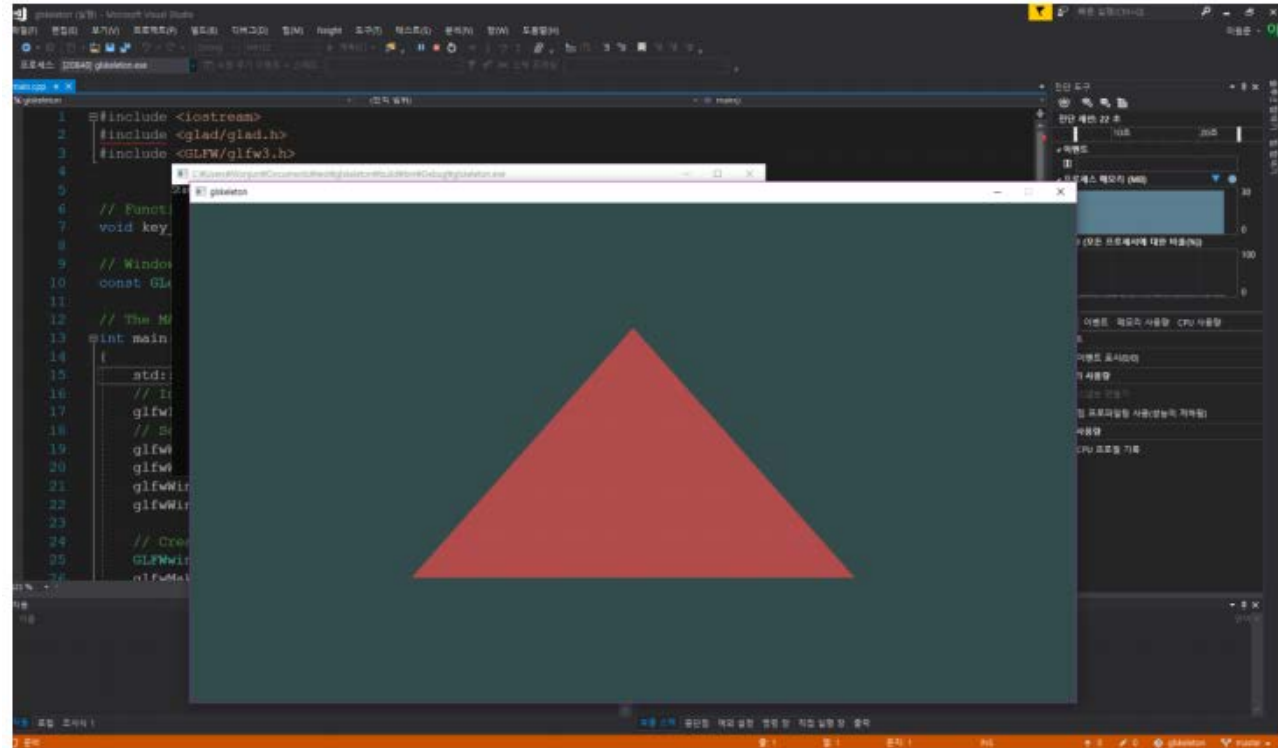
Set Startup Project

1. open glSkeleton.sln in build directory

2. Press 'F5'

* If the console is not automatically generated, then run

' Debug or Release/bin/ *.exe'



The Directory Structure

```
.
├── build
│   ├── CMakeFiles
│   ├── bin
│   ├── extern
│   ├── lib
│   ├── src
│   └── glskeleton.sln
├── extern
│   ├── CMakeLists.txt
│   ├── glad
│   ├── glm
│   └── tinyobjloader
├── doc
├── src
│   └── CMakeLists.txt
└── CMakeLists.txt
12 directories
```

you can find your executable here

you can find your static libraries

your project file

external projects

DO NOT TOUCH THIS

your report/report template

your source code

Q & A

- Do not send email related to PA. Please use issue tab instead.

The screenshot shows a GitHub repository page for 'test-JeongminGu' under the organization 'CGLAB-Classes'. The repository is marked as 'Private'. At the top right, there are buttons for 'Unwatch' (1), 'Star' (0), and 'Fork' (0). Below this is a navigation bar with tabs for 'Code', 'Issues' (2), 'Pull requests' (0), 'Actions', 'Projects' (0), 'Wiki', 'Security', 'Insights', and 'Settings'. The 'Issues' tab is highlighted in yellow. Below the navigation bar, it says 'test-JeongminGu created by GitHub Classroom' with an 'Edit' button. There is a 'Manage topics' link. A progress bar shows '2 commits', '1 branch', '0 packages', '0 releases', and '1 contributor'. Below the progress bar are buttons for 'Branch: master', 'New pull request', 'Create new file', 'Upload files', 'Find file', and 'Clone or download'. At the bottom, there is a commit history table with one entry: 'JeongminGu test' with the latest commit 'dd2b4f3' made '3 days ago'. Below the commit, there is a file listing for 'doc' with a sub-entry 'test' also made '3 days ago'.

CGLAB-Classes / test-JeongminGu Private

Unwatch 1 Star 0 Fork 0

Code Issues 2 Pull requests 0 Actions Projects 0 Wiki Security Insights Settings

test-JeongminGu created by GitHub Classroom Edit

[Manage topics](#)

2 commits 1 branch 0 packages 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find file Clone or download

JeongminGu test Latest commit dd2b4f3 3 days ago

doc	test	3 days ago
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Q & A

- Do not send email related to PA. Please use issue tab instead.

CGLAB-Classes / test-JeongminGu Private

Unwatch 1 Star 0 Fork 0

Code Issues 2 Pull requests 0 Actions Projects 0 Wiki Security Insights Settings

Title

Related Issues **Beta** Try it.

Write Preview AA B i “ <> @

Leave a comment

Attach files by dragging & dropping, selecting or pasting them.

Styling with Markdown is supported

Submit new issue

Assignees
No one—assign yourself

Labels
None yet

Projects
None yet

Milestone
No milestone

Linked pull requests
Successfully merging a pull request may close this issue.
None yet

Git/Markdown

- GitKraken tutorials and tips
 - <https://www.youtube.com/playlist?list=PLe6EXFvnTV78WqGmGSq8JPnafR3IAa55n>
 - https://www.youtube.com/playlist?list=PLe6EXFvnTV7_8z5gjobbe9sMjEHNw8_GE
 - https://www.youtube.com/playlist?list=PLe6EXFvnTV7-_41SpakZoTIYCgX4aMTdU
- Git/github cheat sheet
 - <https://education.github.com/git-cheat-sheet-education.pdf>
 - <https://services.github.com/on-demand/downloads/github-git-cheat-sheet.pdf>
- Github flavored Markdown cheat sheet
 - <https://enterprise.github.com/downloads/en/markdown-cheatsheet.pdf>

OpenGL and Graphics

- The Graphics Codex
 - <https://graphicscodex.com/>
- Scratch pixel
 - <https://www.scratchapixel.com/>
- GLM (Math library manual)
 - <https://github.com/g-truc/glm/blob/master/manual.md>
- GLFW API docs
 - https://www.glfw.org/docs/latest/intro_guide.html
- OpenGL reference page
 - <https://www.khronos.org/registry/OpenGL-Refpages/gl4/>
- Some nice OpenGL tutorials (but most of them are targeting modern opengl, we are going to stick with legacy api)
 - <http://www.songho.ca/opengl/> • <https://learnopengl.com/>