

HƯỚNG DẪN SỬ DỤNG GIT & GITLAB TRONG CÁC DỰ ÁN THỰC HÀNH

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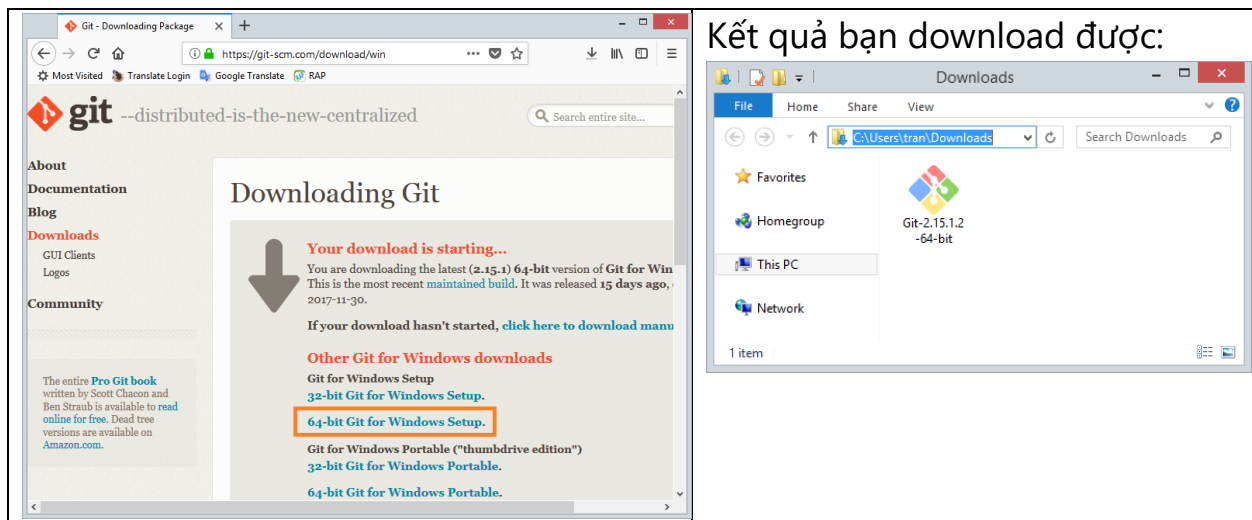
I. Quản lý code

1. Download Git

Git là một "hệ thống điều khiển phiên bản phân tán" (Distributed version control system) miễn phí và mã nguồn mở, nó được thiết kế để một nhóm làm việc cùng nhau có thể chia sẻ và quản lý phiên bản các tập tin trong quá trình làm việc.

Git hỗ trợ các hệ điều hành Windows, Mac OS, Linux (Ubuntu, ..), để download bạn có thể truy cập vào trang chủ của Git: <https://git-scm.com/>

- <https://git-scm.com/download/win> (cho Windows)
-



2. Cài đặt Git

<https://openplanning.net/11707/cai-dat-git-tren-windows>

Cài đặt Git trên Windows rất đơn giản, về cơ bản bạn có thể chấp nhận các mặc định và nhấn Next, Next ... cho tới khi hoàn thành.

Information

Please read the following important information before continuing.

When you are ready to continue with Setup, click Next.

GNU General Public License

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.
69 Temple Place - Suite 330, Boston, MA 02111-1307, USA

Everyone is permitted to copy and distribute verbatim copies
of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your
freedom to share and change it. By contrast, the GNU General Public
License is intended to guarantee your freedom to share and change

https://git-for-windows.github.io/

Next >

Cancel

Select Components

Which components should be installed?

Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.

☐ Additional icons

☐ On the Desktop

☒ Windows Explorer integration

☒ Git Bash Here
 ☒ Git GUI Here

☒ Git LFS (Large File Support)

☒ Associate .git* configuration files with the default text editor
 ☒ Associate .sh files to be run with Bash
 ☐ Use a TrueType font in all console windows
 ☐ Check daily for Git for Windows updates

Current selection requires at least 226.7 MB of disk space.

https://git-for-windows.github.io/

< Back

Next >

Cancel

Select Start Menu Folder

Where should Setup place the program's shortcuts?

Setup will create the program's shortcuts in the following Start Menu folder.

To continue, click Next. If you would like to select a different folder, click Browse.

Browse...

☐ Don't create a Start Menu folder

https://git-for-windows.github.io/

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Next >

Cancel

Git 2.35.2 Setup

Choosing the default editor used by Git

Which editor would you like Git to use?

Use Vim (the ubiquitous text editor) as Git's default editor

The Vim editor, while powerful, can be hard to use. Its user interface is unintuitive and its key bindings are awkward.

Note: Vim is the default editor of Git for Windows only for historical reasons, and it is highly recommended to switch to a modern GUI editor instead.

Note: This will leave the 'core.editor' option unset, which will make Git fall back to the 'EDITOR' environment variable. The default editor is Vim - but you may set it to some other editor of your choice.

https://gitforwindows.org/

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Cancel

Git 2.35.2 Setup

Adjusting the name of the initial branch in new repositories

What would you like Git to name the initial branch after "git init"?

☐ Let Git decide

Let Git use its default branch name (currently: "master") for the initial branch in newly created repositories. The Git project intends to change this default to a more inclusive name in the near future.

☒ Override the default branch name for new repositories

NEW! Many teams already renamed their default branches; common choices are "main", "trunk" and "development". Specify the name "git init" should use for the initial branch:

main

This setting does not affect existing repositories.

https://gitforwindows.org/

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Cancel

Git 2.35.2 Setup

Adjusting your PATH environment

How would you like to use Git from the command line?

☐ Use Git from Git Bash only

This is the most cautious choice as your PATH will not be modified at all. You will only be able to use the Git command line tools from Git Bash.

☒ Git from the command line and also from 3rd-party software

(Recommended) This option adds only some minimal Git wrappers to your PATH to avoid cluttering your environment with optional Unix tools. You will be able to use Git from Git Bash, the Command Prompt and the Windows PowerShell as well as any third-party software looking for Git in PATH.

☐ Use Git and optional Unix tools from the Command Prompt

Both Git and the optional Unix tools will be added to your PATH. Warning: This will override Windows tools like "find" and "sort". Only use this option if you understand the implications.

https://gitforwindows.org/

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Next

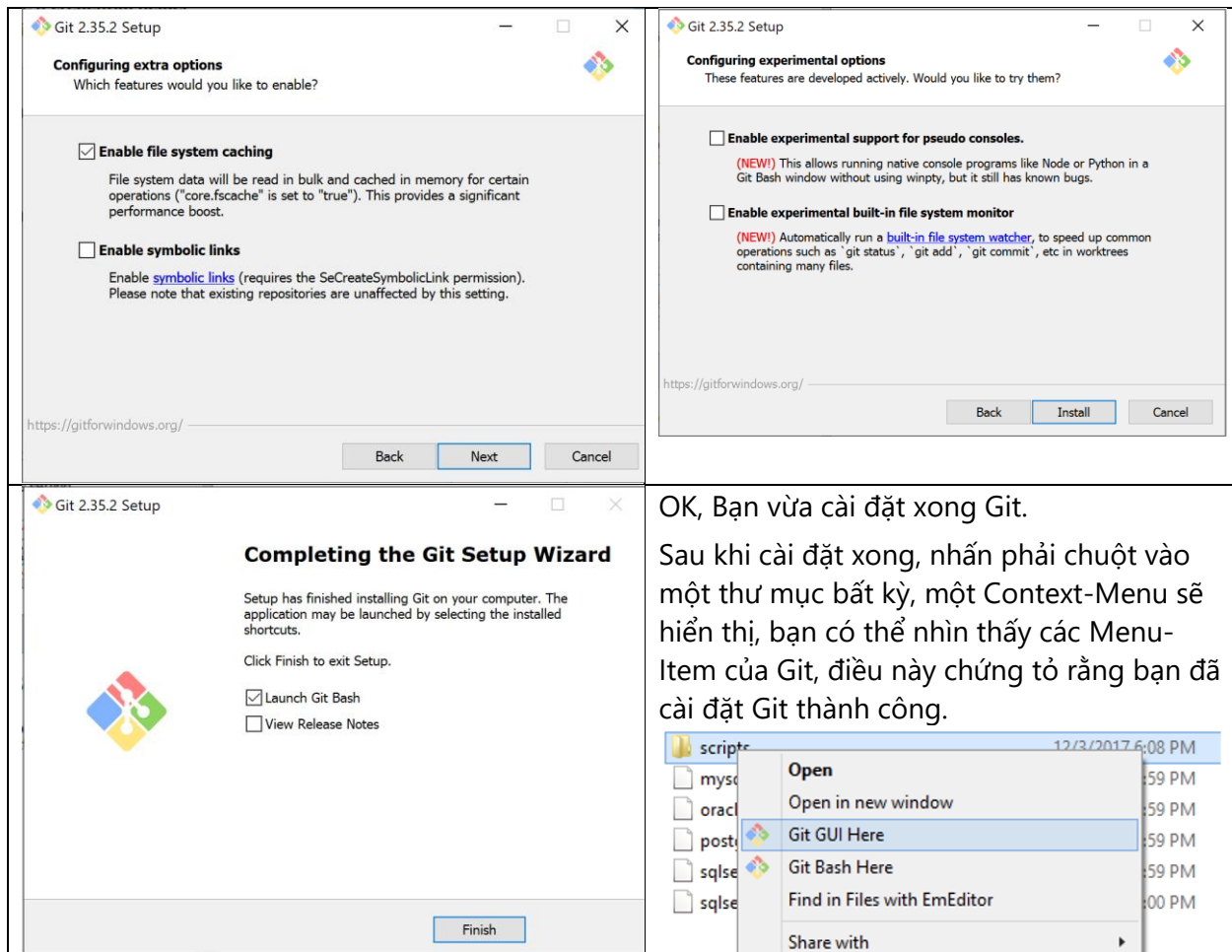
Cancel

3

<p>Git 2.35.2 Setup</p> <p>Choosing the SSH executable Which Secure Shell client program would you like Git to use?</p> <p><input checked="" type="radio"/> Use bundled OpenSSH This uses ssh.exe that comes with Git.</p> <p><input type="radio"/> Use external OpenSSH NEW! This uses an external ssh.exe. Git will not install its own OpenSSH (and related) binaries but use them as found on the PATH.</p> <p>https://gitforwindows.org/</p> <p>Back Next Cancel</p>	<p>Git 2.35.2 Setup</p> <p>Choosing HTTPS transport backend Which SSL/TLS library would you like Git to use for HTTPS connections?</p> <p><input checked="" type="radio"/> Use the OpenSSL library Server certificates will be validated using the ca-bundle.crt file.</p> <p><input type="radio"/> Use the native Windows Secure Channel library Server certificates will be validated using Windows Certificate Stores. This option also allows you to use your company's internal CA certificates distributed e.g. via Active Directory Domain Services.</p> <p>https://gitforwindows.org/</p> <p>Back Next Cancel</p>
<p>Git 2.35.2 Setup</p> <p>Configuring the line ending conversions How should Git treat line endings in text files?</p> <p><input checked="" type="radio"/> Checkout Windows-style, commit Unix-style line endings Git will convert LF to CRLF when checking out text files. When committing text files, CRLF will be converted to LF. For cross-platform projects, this is the recommended setting on Windows ("core.autocrlf" is set to "true").</p> <p><input type="radio"/> Checkout as-is, commit Unix-style line endings Git will not perform any conversion when checking out text files. When committing text files, CRLF will be converted to LF. For cross-platform projects, this is the recommended setting on Unix ("core.autocrlf" is set to "input").</p> <p><input type="radio"/> Checkout as-is, commit as-is Git will not perform any conversions when checking out or committing text files. Choosing this option is not recommended for cross-platform projects ("core.autocrlf" is set to "false").</p> <p>https://gitforwindows.org/</p> <p>Back Next Cancel</p>	<p>Git 2.35.2 Setup</p> <p>Configuring the terminal emulator to use with Git Bash Which terminal emulator do you want to use with your Git Bash?</p> <p><input checked="" type="radio"/> Use MinTTY (the default terminal of MSYS2) Git Bash will use MinTTY as terminal emulator, which sports a resizable window, non-rectangular selections and a Unicode font. Windows console programs (such as interactive Python) must be launched via 'wintpty' to work in MinTTY.</p> <p><input type="radio"/> Use Windows' default console window Git will use the default console window of Windows ("cmd.exe"), which works well with Win32 console programs such as interactive Python or node.js, but has a very limited default scroll-back, needs to be configured to use a Unicode font in order to display non-ASCII characters correctly, and prior to Windows 10 its window was not freely resizable and it only allowed rectangular text selections.</p> <p>https://gitforwindows.org/</p> <p>Back Next Cancel</p>
<p>Git 2.35.2 Setup</p> <p>Choose the default behavior of 'git pull' What should 'git pull' do by default?</p> <p><input checked="" type="radio"/> Default (fast-forward or merge) This is the standard behavior of 'git pull': fast-forward the current branch to the fetched branch when possible, otherwise create a merge commit.</p> <p><input type="radio"/> Rebase Rebase the current branch onto the fetched branch. If there are no local commits to rebase, this is equivalent to a fast-forward.</p> <p><input type="radio"/> Only ever fast-forward Fast-forward to the fetched branch. Fail if that is not possible.</p> <p>https://gitforwindows.org/</p> <p>Back Next Cancel</p>	<p>Git 2.35.2 Setup</p> <p>Choose a credential helper Which credential helper should be configured?</p> <p><input checked="" type="radio"/> Git Credential Manager Use the cross-platform Git Credential Manager. See more information about the future of Git Credential Manager here.</p> <p><input type="radio"/> None Do not use a credential helper.</p> <p>https://gitforwindows.org/</p> <p>Back Next Cancel</p>

<https://github.com/GitCredentialManager/git-credential-manager>

<https://github.com/GitCredentialManager/git-credential-manager/blob/HEAD/docs/faq.md#about-the-project>



3. Dựng project

a. Tạo dự án trên GitLab

- Tạo dự án (trực tiếp hoặc trong group)
- Phân quyền merge & push vào branch main

b. Cấu hình & kết nối Remote

Config Git user (Remove --global for a particular project folder config)

- git config --global user.name "Kien Nguyen"
- git config --global user.email "kiennt@gmail.com"
- git config --global init.defaultBranch "main"

Tạo thư mục & kết nối Remote

- Tạo thư mục dự án trên máy của bạn
- Khởi tạo git local với lệnh sau (tạo thư mục ẩn .git): git init
- Kết nối Remote: git remote add origin <https://gitlab.com/kienpmp/demo.git>

c. Thêm code local & đẩy Remote

Add file01, file02, folder1/file11

Gọi: git add .

Kiểm tra với git status => Gọi git commit => check lại

```
$ git status
On branch main

No commits yet

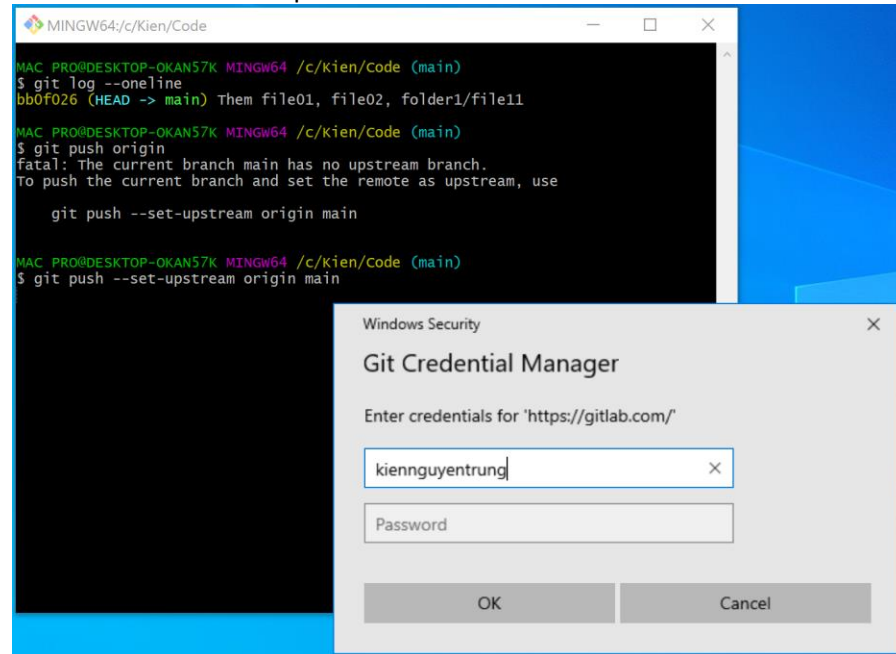
Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:   file01.txt
        new file:   file02.txt
        new file:   folder1/file11.txt

MAC_PRO@DESKTOP-OKAN57K MINGW64 /c/kien/code (main)
$ git commit -m "Them file01, file02, folder1/file11"
[main (root-commit) bb0f026] Them file01, file02, folder1/file11
 3 files changed, 3 insertions(+)
 create mode 100644 file01.txt
 create mode 100644 file02.txt
 create mode 100644 folder1/file11.txt

MAC_PRO@DESKTOP-OKAN57K MINGW64 /c/kien/Code (main)
$ git status
On branch main
nothing to commit, working tree clean

MAC_PRO@DESKTOP-OKAN57K MINGW64 /c/kien/Code (main)
```

Check commit status & push lên remote



Có thể gặp tình huống báo lỗi khác

```
$ git push --set-upstream origin main
To https://gitlab.com/kienpmp/demo.git
 ! [rejected]        main -> main (fetch first)
error: failed to push some refs to 'https://gitlab.com/kienpmp/demo.git'
hint: Updates were rejected because the remote contains work that you do
hint: not have locally. This is usually caused by another repository pushing
hint: to the same ref. You may want to first integrate the remote changes
hint: (e.g., 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.

MAC_PRO@DESKTOP-OKAN57K MINGW64 /c/kien/Code (main)
```

Lúc này bạn phải pull thông tin trên Remote về trước

```

$ git pull
There is no tracking information for the current branch.
Please specify which branch you want to merge with.
See git-pull(1) for details.

    git pull <remote> <branch>

If you wish to set tracking information for this branch you can do so with:

    git branch --set-upstream-to=origin/<branch> main

MAC PRO@DESKTOP-OKAN57K MINGW64 /c/kien/code (main)
$ git pull origin main
From https://gitlab.com/kienpmp/demo
* branch      main      -> FETCH_HEAD
fatal: refusing to merge unrelated histories

MAC PRO@DESKTOP-OKAN57K MINGW64 /c/kien/code (main)

$ git pull origin main --allow-unrelated-histories
From https://gitlab.com/kienpmp/demo
* branch      main      -> FETCH_HEAD
Merge made by the 'ort' strategy.
 README.md | 92 ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
 1 file changed, 92 insertions(+)
 create mode 100644 README.md

MAC PRO@DESKTOP-OKAN57K MINGW64 /c/kien/code (main)

```

Lưu ý các phím tắt “i” => Esc => “:” => “q!” khi vào edit thông tin merge comment trong vim <https://freetuts.net/cach-su-dung-vi-vim-editor-trong-linux-3342.html>

Sau đó gọi lại push, nhưng có thể bị lỗi chưa có quyền đẩy lên nhánh protected

```

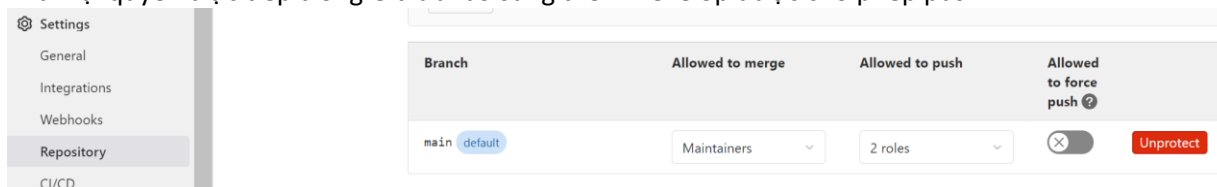
MAC PRO@DESKTOP-OKAN57K MINGW64 /c/kien/code (main)
$ git log --oneline
22ceb47 (HEAD -> main) Merge branch 'main' of https://gitlab.com/kienpmp/demo
bb0f026 Them file01, file02, folder1/file11
bda289d (origin/main) Initial commit

MAC PRO@DESKTOP-OKAN57K MINGW64 /c/kien/code (main)
$ git push origin main
Enumerating objects: 9, done.
Counting objects: 100% (9/9), done.
Delta compression using up to 8 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (8/8), 652 bytes | 217.00 KiB/s, done.
Total 8 (delta 1), reused 0 (delta 0), pack-reused 0
remote: GitLab: You are not allowed to push code to protected branches on this p
project.
To https://gitlab.com/kienpmp/demo.git
! [remote rejected] main -> main (pre-receive hook declined)
error: failed to push some refs to 'https://gitlab.com/kienpmp/demo.git'

MAC PRO@DESKTOP-OKAN57K MINGW64 /c/kien/code (main)

```

Phân lại quyền trực tiếp trong GitLab: bổ sung thêm Develop được cho phép push



The screenshot shows the GitLab 'Settings' page for a repository, specifically the 'Repository' tab. On the left, a sidebar lists settings categories: Settings, General, Integrations, Webhooks, Repository (selected), and CI/CD. The main content area displays a table of branch protection rules for the 'main' branch, which is the default branch.

Branch	Allowed to merge	Allowed to push	Allowed to force push ?
main default	Maintainers	2 roles	<input checked="" type="checkbox"/> Unprotect


Và sau đó đẩy được các commits lên Remote

```
$ git push origin main
Enumerating objects: 9, done.
Counting objects: 100% (9/9), done.
Delta compression using up to 8 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (8/8), 652 bytes | 217.00 KiB/s, done.
Total 8 (delta 1), reused 0 (delta 0), pack-reused 0
To https://gitlab.com/kienpmp/demo.git
bda289d..22ceb47  main -> main

MAC PRO@DESKTOP-OKAN57K MINGW64 /c/kien/Code (main)
```

This PC > Data (C:) > Kien > Code					Search Code	
Name	Date modified	Type	Size			
.git	4/15/2022 8:51 AM	File folder				
folder1	4/14/2022 10:22 PM	File folder				
file01	4/14/2022 10:22 PM	Text Document	1 KB			
file02	4/14/2022 10:22 PM	Text Document	1 KB			
README.md	4/15/2022 8:49 AM	MD File	7 KB			

main demo / + History Find file Web IDE Clone

 Merge branch 'main' of https://gitlab.com/kienpmp/demo
Kien Nt authored 17 minutes ago 22ceb471

Name	Last commit	Last update
folder1	Them file01, file02, folder1/file11	41 minutes ago
README.md	Initial commit	21 hours ago
file01.txt	Them file01, file02, folder1/file11	41 minutes ago
file02.txt	Them file01, file02, folder1/file11	41 minutes ago


Demo Project


Project information Repository Files Commits Branches Tags Contributors Graph Compare Issues

Kien Projects > Demo Project > Commits


main demo Author Search by message

15 Apr, 2022 2 commits

 Merge branch 'main' of https://gitlab.com/kienpmp/demo
Kien Nt authored 19 minutes ago 22ceb471

 Them file01, file02, folder1/file11
Kien Nt authored 43 minutes ago bbef0269

14 Apr, 2022 1 commit

 Initial commit
Kien Fu authored 21 hours ago bda289de

4. Pull new/updated codes

Việc này được thực hiện khi lần đầu dựng project, lấy tất cả các files mới nhất về. Sau này, trong quá trình làm việc, đầu mỗi ngày, trước khi bắt đầu code, bạn lên Remote để lấy codes update về.

- git pull origin main
Nếu là lần đầu đăng nhập thì bạn cần nhập thông tin đăng nhập trước khi PULL

```
[kmb:Demo kiennt$ git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint:   git config --global init.defaultBranch <name>
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint:   git branch -m <name>
Initialized empty Git repository in /Users/kiennt/FeStore/MyDrive/Coding/GitTools/Demo/.git/
[kmb:Demo kiennt$ git remote add origin https://gitlab.com/kienpmp/demo.git
[kmb:Demo kiennt$ git pull origin main
hint: Pulling without specifying how to reconcile divergent branches is
hint: discouraged. You can squelch this message by running one of the following
hint: commands sometime before your next pull:
hint:
hint:   git config pull.rebase false  # merge (the default strategy)
hint:   git config pull.rebase true   # rebase
hint:   git config pull.ff only       # fast-forward only
hint:
hint: You can replace "git config" with "git config --global" to set a default
hint: preference for all repositories. You can also pass --rebase, --no-rebase,
hint: or --ff-only on the command line to override the configured default per
hint: invocation.
Username for 'https://gitlab.com': kienntvn@gmail.com
Password for 'https://kienntvn@gmail.com@gitlab.com':
```

Trường hợp đã đăng nhập rồi mà muốn đăng nhập với user khác thì vào Credential Manager (hoặc Keychain Access trong Mac) tìm và xóa Internet Login hiện tại tới GitLab trước khi PULL

Kết quả sau khi PULL

```
remote: Enumerating objects: 11, done.
remote: Counting objects: 100% (11/11), done.
remote: Compressing objects: 100% (6/6), done.
remote: Total 11 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (11/11), 3.47 KiB | 296.00 KiB/s, done.
From https://gitlab.com/kienpmp/demo
* branch                main          -> FETCH_HEAD
* [new branch]          main          -> origin/main
```

5. Thêm/Sửa & Push codes

a. Thêm file04.txt & sửa file01.txt

- git add .
- git commit -m "Add file04.txt and change file01.txt"
- git push origin main

Gặp lỗi như sau

```
[kmb:Demo kiennt$ git config --list
credential.helper=osxkeychain
user.name=Kien Nguyen
user.email=kiennt@fpt.edu.vn
core.excludesfile=/Users/kiennt/FuStore/.gitignore_global
difftool.sourcetree.cmd=opendiff "$LOCAL" "$REMOTE"
difftool.sourcetree.path=
mergetool.sourcetree.cmd=/Applications/Sourcetree.app/Contents/Resources/opendif
f-w.sh "$LOCAL" "$REMOTE" -ancestor "$BASE" -merge "$MERGED"
mergetool.sourcetree.trustexitcode=true
commit.template=/Users/kiennt/FuStore/.stCommitMsg
core.repositoryformatversion=0
core.filemode=true
core.bare=false
core.logallrefupdates=true
core.ignorecase=true
core.precomposeunicode=true
remote.origin.url=https://gitlab.com/kienpmp/demo.git
remote.origin.fetch=+refs/heads/*:refs/remotes/origin/*
[kmb:Demo kiennt$ pwd
/Users/kiennt/FuStore/MyDrive/Coding/GitTools/Demo
[kmb:Demo kiennt$ git add .
[kmb:Demo kiennt$ git commit -m "Thêm file04 và sửa file01"
[master 33ad8e9] Thêm file04 và sửa file01
 2 files changed, 3 insertions(+), 1 deletion(-)
 create mode 100644 file04.txt
[kmb:Demo kiennt$ git push origin main
error: src refspec main does not match any
error: failed to push some refs to 'https://gitlab.com/kienpmp/demo.git'
```

Lý do lỗi:

- Khi init git ở bước 1.4, nhánh master được tạo trên local
- Sau khi PULL, codes từ nhánh main được đưa vào nhánh master trên local
- Push từ master lên main trên Remote sẽ sinh ra lỗi này (gọi lệnh git show-ref để check)

Gọi lại theo lệnh git push origin master thì OK

```
[kmb:Demo kiennt$ git push origin master
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (4/4), 423 bytes | 423.00 KiB/s, done.
Total 4 (delta 0), reused 0 (delta 0), pack-reused 0
remote:
remote: To create a merge request for master, visit:
remote:   https://gitlab.com/kienpmp/demo/-/merge_requests/new?merge_request%5Bs
ource_branch%5D=master
remote:
To https://gitlab.com/kienpmp/demo.git
* [new branch]      master -> master
```

b. Đổi config user.email, thêm file03.txt

Vẫn ở nhánh master & giữ cấu hình remote

Đổi config sang email chưa được phân quyền

- git config --global user.name "Kien Yh"
- git config --global user.email "kienntvn@yahoo.com"

Thêm file03.txt và chạy các lệnh sau

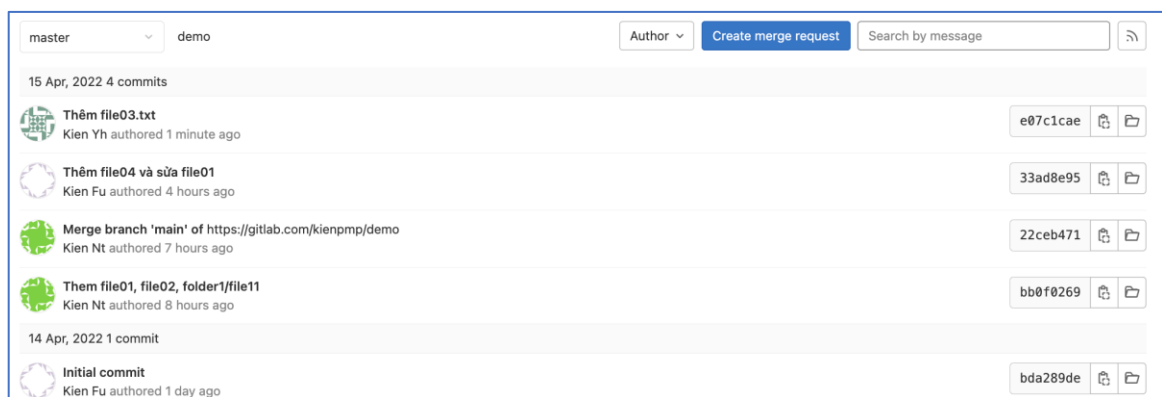
- git add .
- git commit -m "Thêm file03.txt"
- git push => báo lỗi, phải chạy lại: git push origin master

```
[kmb:Demo kiennt$ git push
fatal: The current branch master has no upstream branch.
To push the current branch and set the remote as upstream, use

    git push --set-upstream origin master

[kmb:Demo kiennt$ git branch
main
* master
[kmb:Demo kiennt$ git push origin master
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (2/2), 234 bytes | 234.00 KiB/s, done.
Total 2 (delta 1), reused 0 (delta 0), pack-reused 0
remote:
remote: To create a merge request for master, visit:
remote:   https://gitlab.com/kienpmp/demo/-/merge_requests/new?merge_request%5Bsource_branch%5D=master
remote:
To https://gitlab.com/kienpmp/demo.git
33ad8e9..e07c1ca master -> master
kmb:Demo kiennt$
```

Và vẫn đẩy file lên thành công (lưu ý vẫn đang login gitlab internet bằng kienntvn@gmail.com)



c. Chuyển nhánh main, thêm file05-06-07

Chuyển sang nhánh main (dùng git checkout hoặc git switch), thêm file05.txt sau đó thực hiện các lệnh đẩy lên (vẫn config dùng email ko tồn tại, login vẫn đang dùng kienntvn@gmail.com). Vẫn đẩy OK..


```
[kmb:Demo kiennt$ git add .
[kmb:Demo kiennt$ git commit -m "Thêm file05.txt"
[main f16aa9e] Thêm file05.txt
1 file changed, 1 insertion(+)
create mode 100644 file05.txt
[kmb:Demo kiennt$ git push origin main
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 292 bytes | 292.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
To https://gitlab.com/kienpmp/demo.git
22ceb47..f16aa9e main -> main
```

Tương tự vẫn OK khi: thêm file06 và file07 -> commit1, sau đó là sửa file06 -> commit2

```
[kmb:Demo kiennt$ git push origin main
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 8 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (6/6), 563 bytes | 563.00 KiB/s, done.
Total 6 (delta 2), reused 0 (delta 0), pack-reused 0
To https://gitlab.com/kienpmp/demo.git
f16aa9e..fc4e237 main -> main
```

Kết quả:

main
demo / +
History Find file Web IDE
Download Clone


Sửa file06.txt so với lần commit trước, chưa push
Kien Yh authored 2 minutes ago
fc4e237

Name	Last commit	Last update
folder1	Them file01, file02, folder1/file11	8 hours ago
README.md	Initial commit	1 day ago
file01.txt	Them file01, file02, folder1/file11	8 hours ago
file02.txt	Them file01, file02, folder1/file11	8 hours ago
file05.txt	Thêm file05.txt	12 minutes ago
file06.txt	Sửa file06.txt so với lần commit trước, chư...	2 minutes ago
file07.txt	Thêm file07.txt	3 minutes ago

6. Xử lý xung đột nội dung files

Tiếp tục thực hiện các bước ở trên trên 2 môi trường làm việc khác nhau như sau

- Demo: kienntvn@gmail.com (Kien Vn)
- Demo2: kiennt@gmail.com (Kien Nt)

B1_Vào Demo/main, chạy: git pull origin main => OK

B2_Vào Demo2/main, chạy: git pull origin main => OK

B3_Vào Demo/main, sửa file07 (thêm line2) rồi push lên Remote => OK

```
[kmb:Demo kiennt$ git add .
[kmb:Demo kiennt$ git commit -m "Update file07 thêm line2"
[main 09cbbdd] Update file07 thêm line2
 1 file changed, 2 insertions(+), 1 deletion(-)
[kmb:Demo kiennt$ git push origin main
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 283 bytes | 283.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
To https://gitlab.com/kienpmp/demo.git
fc4e237..09cbbdd main -> main
```

B4_Vào Demo2/main, sửa file07 (thêm line3) rồi push lên Remote => NOK

```
[kmb:Demo2 kiennt$ git add .
[kmb:Demo2 kiennt$ git commit -m "Sửa file07 thêm line3"
[main 423d4b9] Sửa file07 thêm line3
 1 file changed, 2 insertions(+), 1 deletion(-)
[kmb:Demo2 kiennt$ git push origin main
To https://gitlab.com/kienpmp/demo.git
! [rejected]        main -> main (fetch first)
error: failed to push some refs to 'https://gitlab.com/kienpmp/demo.git'
hint: Updates were rejected because the remote contains work that you do
hint: not have locally. This is usually caused by another repository pushing
hint: to the same ref. You may want to first integrate the remote changes
hint: (e.g., 'git pull ...') before pushing again.
hint: See the 'Note about fast-forwards' in 'git push --help' for details.
```

B5_Vào Demo2/main, gọi git pull origin main để kéo codes mới nhất trên Remote về, khi này có conflicts mà ko tự động merge được










```
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 263 bytes | 87.00 KiB/s, done.
From https://gitlab.com/kienpmp/demo
 * branch                main      -> FETCH_HEAD
   fc4e237..09cbbdd      main      -> origin/main
Auto-merging file07.txt
CONFLICT (content): Merge conflict in file07.txt
Automatic merge failed; fix conflicts and then commit the result.
```

B6_Khi đó cần sửa thủ công nội dung file07 từ nội dung mà Git tự trộn từ các commits song song để đưa ra ra nội dung final

Trước sửa thủ công	Sau sửa thủ công
file7_line1 <<<<<< HEAD file7_line3 ===== file7_line2 >>>>>> 09cbbdd1549dda2a6450e9476d63f3099c282c94	file7_line1 file7_line2 file7_line3

B7_push lại lên Remote (Add => Commit => Push), kết quả sau merge và đẩy lại lên Remote

```
kmb:Demo2 kiennt$ git add .
kmb:Demo2 kiennt$ git commit -m "Update file07 sau khi Git merge tự động"
[main 7dfc99f] Update file07 sau khi Git merge tự động
kmb:Demo2 kiennt$ git push origin main
Enumerating objects: 10, done.
Counting objects: 100% (10/10), done.
Delta compression using up to 8 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (6/6), 597 bytes | 597.00 KiB/s, done.
Total 6 (delta 2), reused 0 (delta 0), pack-reused 0
To https://gitlab.com/kienpmp/demo.git
09cbbdd..7dfc99f main -> main
```

16 Apr, 2022 3 commits		
	Update file07 sau khi Git merge tự động Kien Nt authored 1 minute ago	7dfc99f0  
	Sửa file07 thêm line3 Kien Nt authored 21 minutes ago	423d4b9d  
	Update file07 thêm line2 Kien Vn authored 22 minutes ago	09cbbdd1  

7. Làm việc với nhánh (branch)

a. Các lệnh phổ biến

- `git branch -a` => All repo branches & current branch
- `git branch <new_branch>` => Tạo một branch mới trong Git
- `git checkout -b <br_name>` => Create new branch and switch to that
- `git checkout <br_name>` => Chuyển đổi qua lại giữa các branch
- `git branch -d <br_name>` => Xoá branch có tên tương ứng

b. Tách nhánh mới iter2

Đang ở Demo2 => check “git branch -a” thì thấy chỉ có 1 branch main (ở cả local & remote)

Chuyển về Demo => check “git branch -a” thì thấy có 2 branches là main và master (ở cả local & remote)

Chuyển sang branch main và chạy: `git pull origin main`































Tạo & chuyển sang branch mới với tên iter2:
`git checkout -b iter2`

Thêm file08 & sửa file01 (line1x, line3, line4)

Đẩy code lên Remote: `git push origin iter2`

Kết quả có được nội dung nhánh iter2 như sau

```
kmb:demo kiennt$ git add .
kmb:demo kiennt$ git commit -m "Sửa file01 và thêm file08"
[iter2 cba6b99] Sửa file01 và thêm file08
2 files changed, 4 insertions(+), 1 deletion(-)
create mode 100644 file08.txt
kmb:demo kiennt$ git push origin iter2
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (4/4), 360 bytes | 360.00 KiB/s, done
Total 4 (delta 1), reused 0 (delta 0), pack-reused 0
remote:
remote: To create a merge request for iter2, visit:
remote:   https://gitlab.com/kienpmp/demo/-/merge_requests/new?merge_request%5Bsource_branch%5D=iter2
remote:
To https://gitlab.com/kienpmp/demo.git
* [new branch]      iter2 -> iter2
```

17 Apr, 2022 1 commit		
	Sửa file01 và thêm file08 Kien Vn authored 36 minutes ago	cba6b997  
16 Apr, 2022 3 commits		
	Update file07 sau khi Git merge tự động Kien Nt authored 9 hours ago	7dfc99f0  
	Sửa file07 thêm line3 Kien Nt authored 9 hours ago	423d4b9d  
	Update file07 thêm line2 Kien Nt authored 9 hours ago	09cbbdd1  
15 Apr, 2022 5 commits		
	Sửa file06.txt so với lần commit trước, chưa push Kien Yh authored 1 day ago	fc4e2373  
	Thêm file07.txt Kien Yh authored 1 day ago	b4cae72b  
	Thêm file05.txt Kien Yh authored 1 day ago	f16aa9e5  
	Merge branch 'main' of https://gitlab.com/kienpmp/demo Kien Nt authored 1 day ago	22ceb471  
	Them file01, file02, folder1/file11 Kien Nt authored 1 day ago	bb0f0269  
14 Apr, 2022 1 commit		
	Initial commit Kien Fu authored 2 days ago	bda289de  

c. Sửa & merge nhánh

B1_Vẫn ở Demo/iter2: thêm file09, sửa file06 (thêm line2), sửa file01 (line3y & thêm line6)

```
kmb:demo kiennt$ git add .
kmb:demo kiennt$ git commit -m "thêm file09, sửa file06 (thêm line2), sửa file01 (line3y & thêm line6)"
[iter2 0bfff9f] thêm file09, sửa file06 (thêm line2), sửa file01 (line3y & thêm line6)
3 files changed, 6 insertions(+), 3 deletions(-)
create mode 100644 file09.txt
kmb:demo kiennt$ git push origin iter2
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (5/5), 438 bytes | 438.00 KiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0
remote:
remote: To create a merge request for iter2, visit:
remote:   https://gitlab.com/kienpmp/demo/-/merge_requests/new?merge_request%5Bsource_branch%5D=iter2
remote:
To https://gitlab.com/kienpmp/demo.git
 cba6b99..0bfff9f  iter2 -> iter2
```

B2_Chuyển Demo2/main: thêm file10, sửa file02 (thêm line2), sửa file01 (thêm line5)


```
kmb:demo2 kiennt$ git add .
kmb:demo2 kiennt$ git commit -m "thêm file10, sửa file02 (thêm line2), sửa file01 (thêm line5)"
[main 7e615dc] thêm file10, sửa file02 (thêm line2), sửa file01 (thêm line5)
3 files changed, 5 insertions(+), 2 deletions(-)
create mode 100644 file10.txt
kmb:demo2 kiennt$ git push origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Delta compression using up to 8 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (5/5), 538 bytes | 538.00 KiB/s, done.
Total 5 (delta 0), reused 0 (delta 0), pack-reused 0
To https://gitlab.com/kienpmp/demo.git
7dfc99f..7e615dc main -> main
```

B3_Chuyển Demo/main: Merge iter2 vào main

Cập nhật nhánh main với các nội dung mới nhất (update từ Demo2): git pull origin main

```
remote: Enumerating objects: 8, done.
remote: Counting objects: 100% (8/8), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 5 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (5/5), 518 bytes | 129.00 KiB/s, done.
From https://gitlab.com/kienpmp/demo
* branch main -> FETCH_HEAD
7dfc99f..7e615dc main -> origin/main
Updating 7dfc99f..7e615dc
Fast-forward
 file01.txt | 3 ++-
 file02.txt | 3 ++-
 file10.txt | 1 +
3 files changed, 5 insertions(+), 2 deletions(-)
create mode 100644 file10.txt
```

Gọi git merge iter2, báo lỗi như sau (file09 và file06 cập nhật được tự động merge về)

```
kmb:demo kiennt$ git merge iter2
Auto-merging file01.txt
CONFLICT (content): Merge conflict in file01.txt
Automatic merge failed; fix conflicts and then commit the result.
```

```
<<<<<< HEAD
file1_line1
file1_line5
=====
file1_line1x
file1_line3y
file1_line4
file1_line6
>>>>>> iter2
```

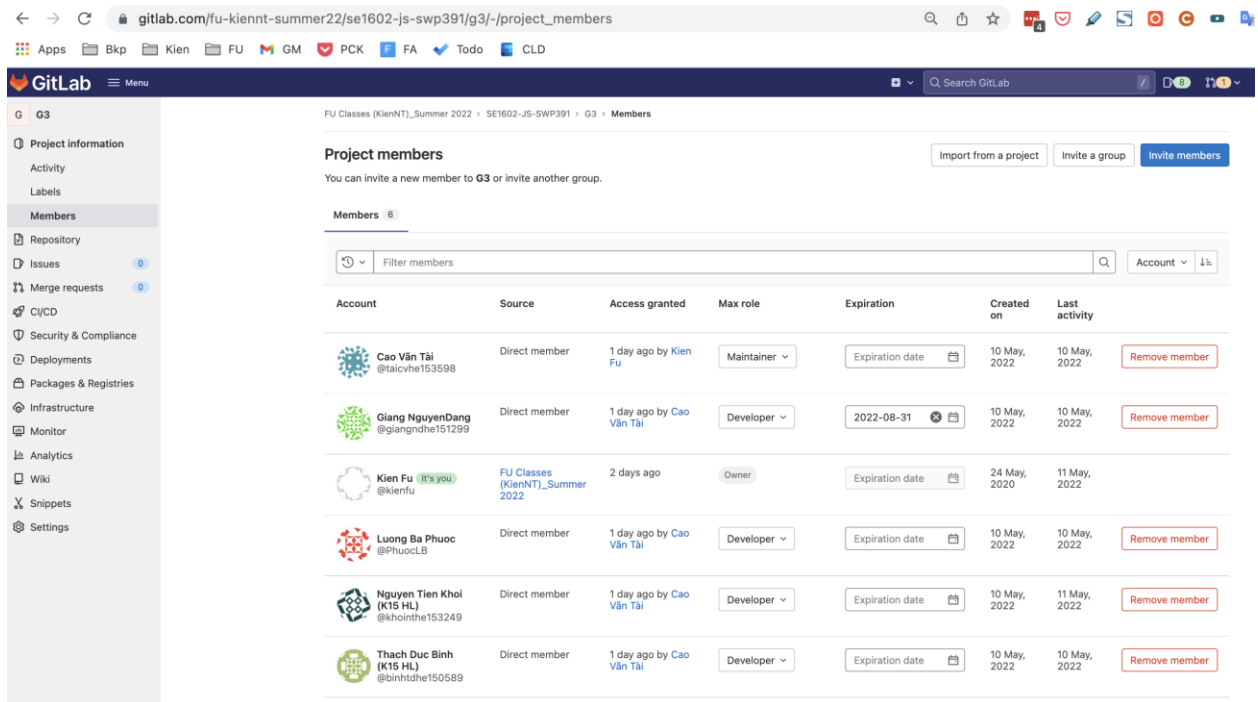
Sửa file01 thủ công, được kết quả như sau (nhánh main khi đó có đủ các comments đã thực hiện trên main + 2 commits đã thực hiện trên nhánh iter2, xếp theo thứ tự tương ứng thời gian commits)

```
kmb:demo kiennt$ git merge iter2
Auto-merging file01.txt
CONFLICT (content): Merge conflict in file01.txt
Automatic merge failed; fix conflicts and then commit the result.
kmb:demo kiennt$ git add .
kmb:demo kiennt$ git commit -m "merge nhánh iter2 vào và xử lý xung đột thủ công trên file01"
[main 92bb3c6] merge nhánh iter2 vào và xử lý xung đột thủ công trên file01
kmb:demo kiennt$ git push origin main
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 465 bytes | 465.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
To https://gitlab.com/kienpmp/demo.git
7e615dc..92bb3c6 main -> main
```

```
file1_line1x
file1_line3y
file1_line4
file1_line5
file1_line6
```

II. Theo dõi thông tin dự án

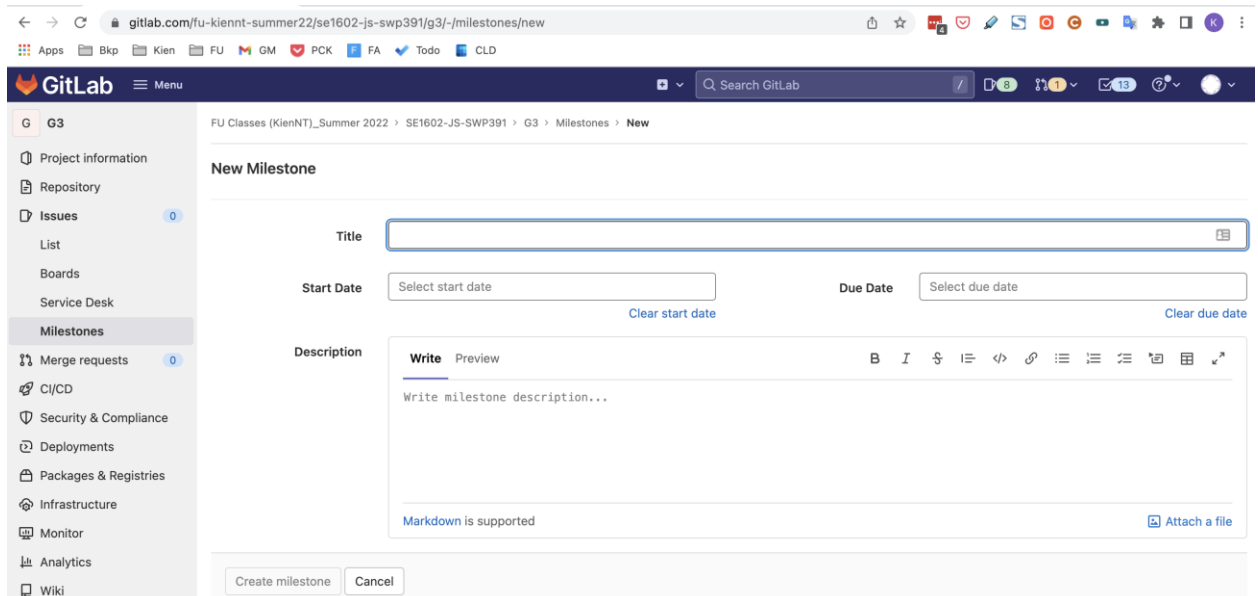
1. Phân quyền tham gia dự án



The screenshot shows the GitLab interface for the project 'FU Classes (KienNT)_Summer 2022'. The 'Members' tab is selected, displaying a list of 6 members. The table below summarizes the member information:

Account	Source	Access granted	Max role	Expiration	Created on	Last activity	
Cao Văn Tài (@taicvhe153598)	Direct member	1 day ago by Kien Fu	Maintainer	Expiration date	10 May, 2022	10 May, 2022	Remove member
Giang NguyenDang (@giangndhe151299)	Direct member	1 day ago by Cao Văn Tài	Developer	2022-08-31	10 May, 2022	10 May, 2022	Remove member
Kien Fu (It's you) (@kienfu)	FU Classes (KienNT)_Summer 2022	2 days ago	Owner	Expiration date	24 May, 2020	11 May, 2022	
Luong Ba Phuoc (@PhuocLB)	Direct member	1 day ago by Cao Văn Tài	Developer	Expiration date	10 May, 2022	10 May, 2022	Remove member
Nguyen Tien Khoi (K15 HL) (@khoith153249)	Direct member	1 day ago by Cao Văn Tài	Developer	Expiration date	10 May, 2022	11 May, 2022	Remove member
Thach Duc Binh (K15 HL) (@binhdhe150589)	Direct member	1 day ago by Cao Văn Tài	Developer	Expiration date	10 May, 2022	10 May, 2022	Remove member

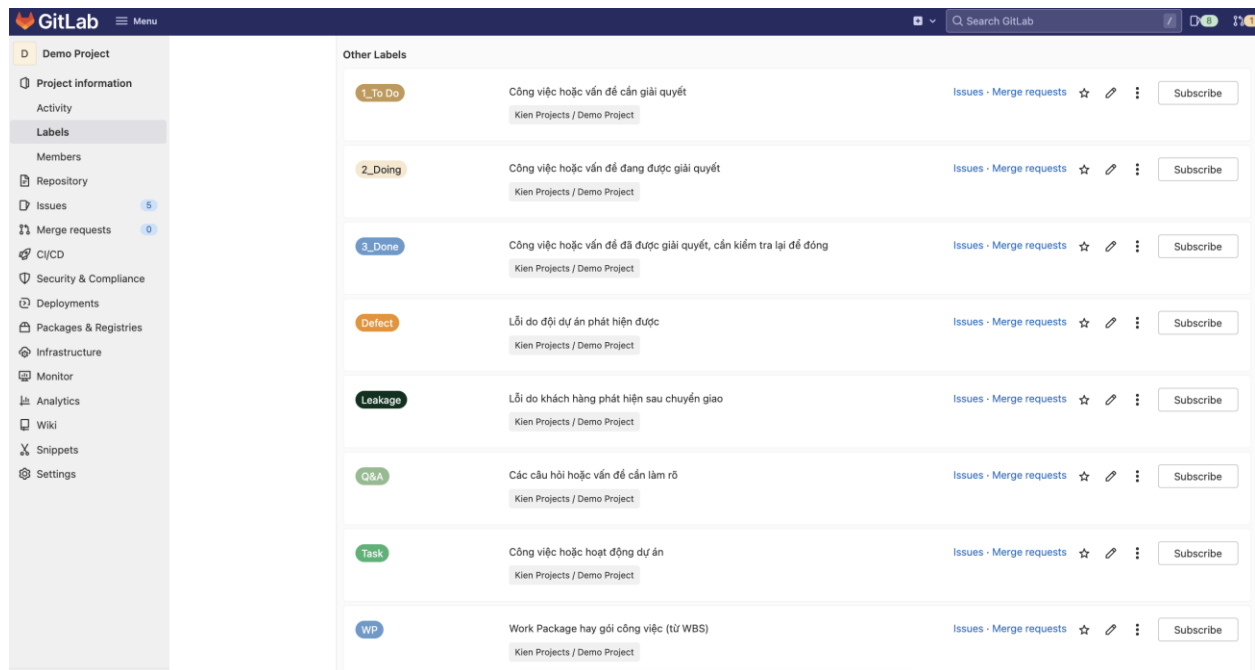
2. Thêm, cấu hình các milestones



The screenshot shows the 'New Milestone' form in GitLab. The form includes the following fields and options:

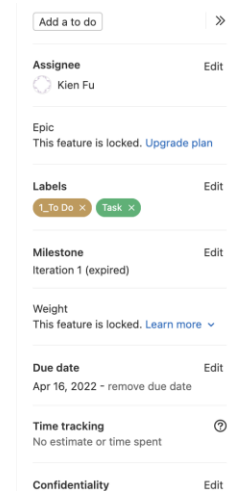
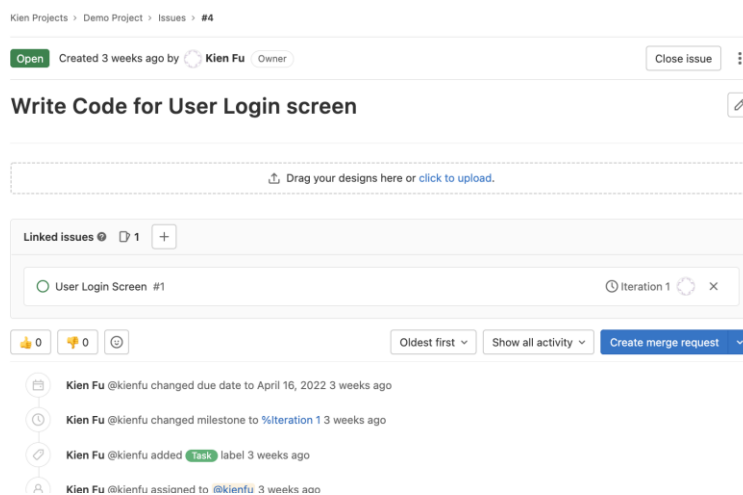
- Title:** A text input field.
- Start Date:** A date picker with a 'Clear start date' link.
- Due Date:** A date picker with a 'Clear due date' link.
- Description:** A rich text editor with a 'Write' tab, a 'Preview' tab, and a 'Markdown is supported' note. It also includes an 'Attach a file' button.
- Buttons:** 'Create milestone' and 'Cancel' buttons at the bottom.

3. Tạo các nhãn theo dõi issue



4. Thêm mới, cập nhật thông tin issue

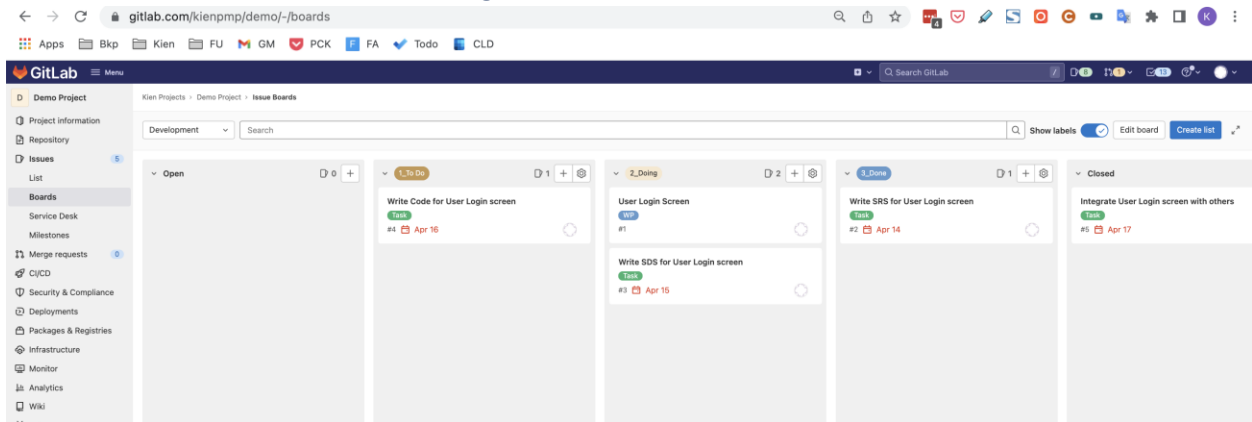
- Issue Milestones: map to one of the created milestones
- Project Issue Type
 - Requirements: Label = WP
 - Tasks: Label = Task
 - Questions & Answers: Label = Q&A,
 - Project Defect: Label = Defect
 - Project Leakage: Label = Leakage
 - Other Project Issue: no label
- Link non-requirement issue to requirement:



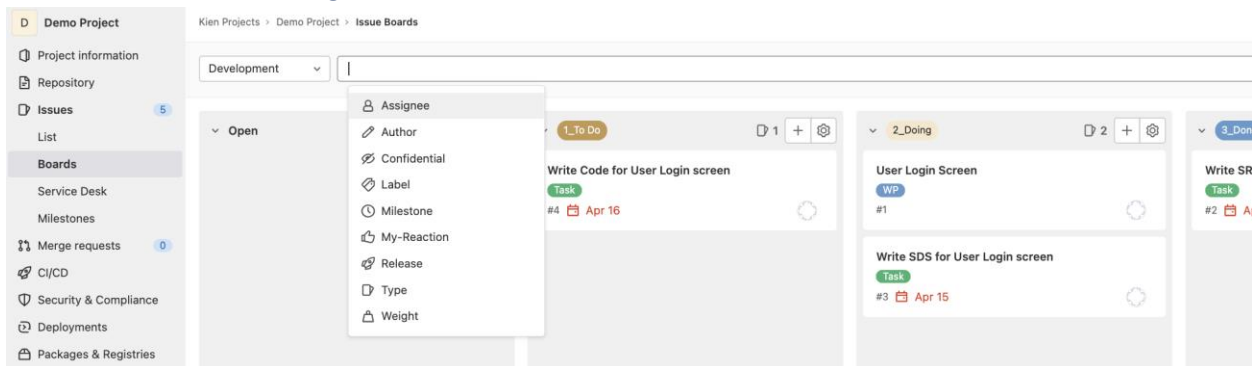
- Issue Status: [Open: 1_To do, 2_Doing, 3_Done], [Closed]

5. Hiện thị & theo dõi issue status theo Boards

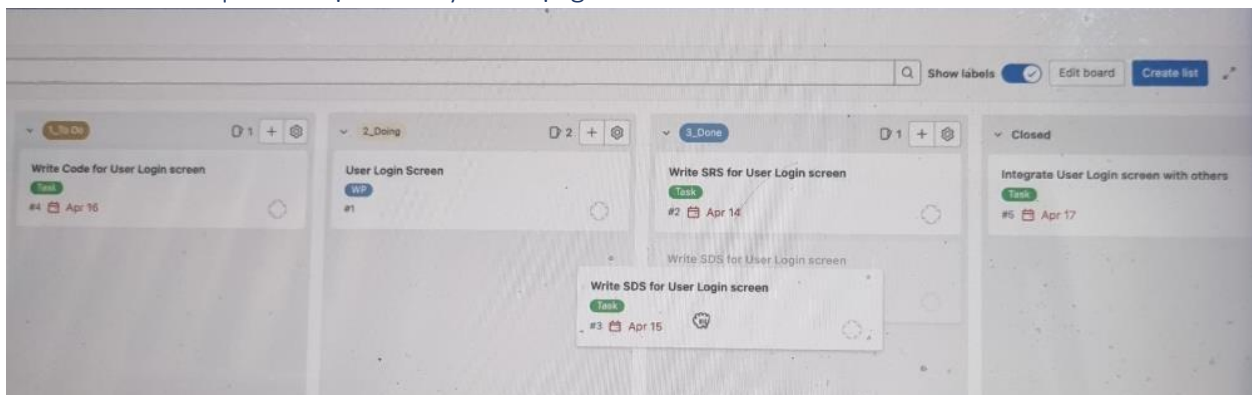
a. Cấu hình các cột hiển thị theo trạng thái



b. Lọc các issue theo Assignee, Label, Milestone,...



c. Kéo thả issue qua các cột để thay đổi trạng thái



Chúng ta cũng có thể kéo thả issue trong cùng 1 cột đến các vị trí khác nhau để thay đổi thứ tự hiển thị (mức ưu tiên thực hiện) của issue

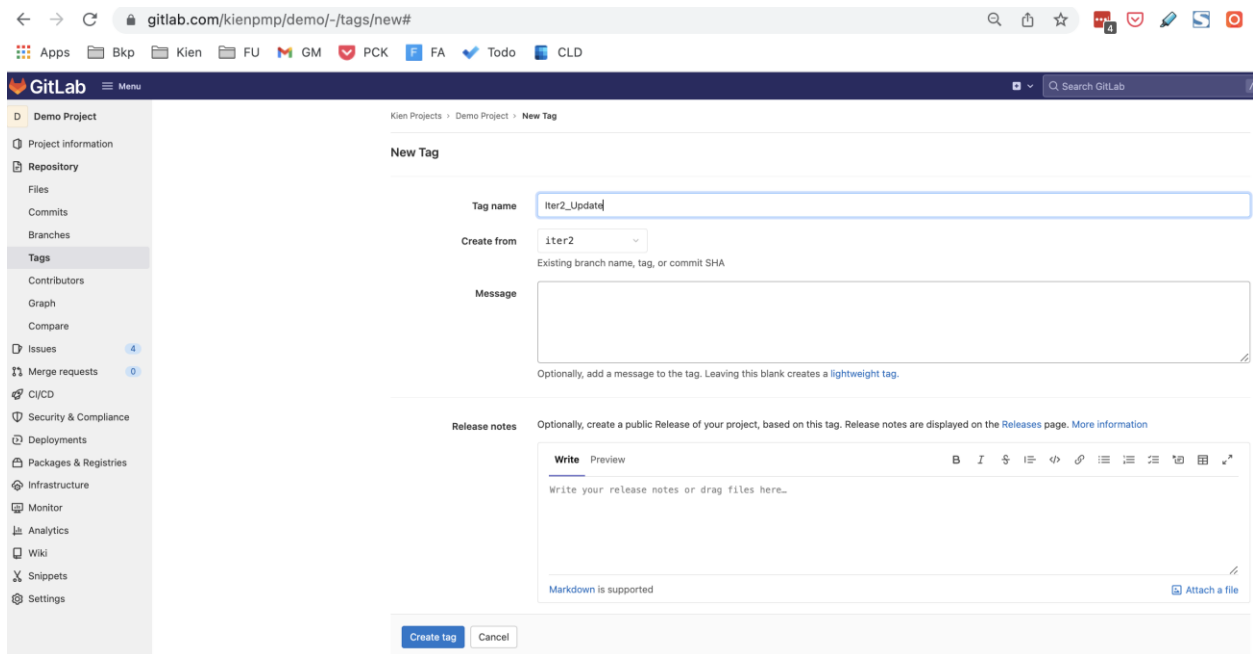
d. Import/Export Issues

GitLab có tính năng cho phép chúng ta có thể import hoặc export danh sách issues từ/đến file CSV. Việc này giúp chúng ta có thể nhập thông tin issue từ danh sách có sẵn một cách nhanh chóng (import), hoặc chiết suất danh sách các thông tin issue đang có một cách nhanh chóng (thông qua export)

6. Tag code chuẩn bị cho release

a. Create new tag

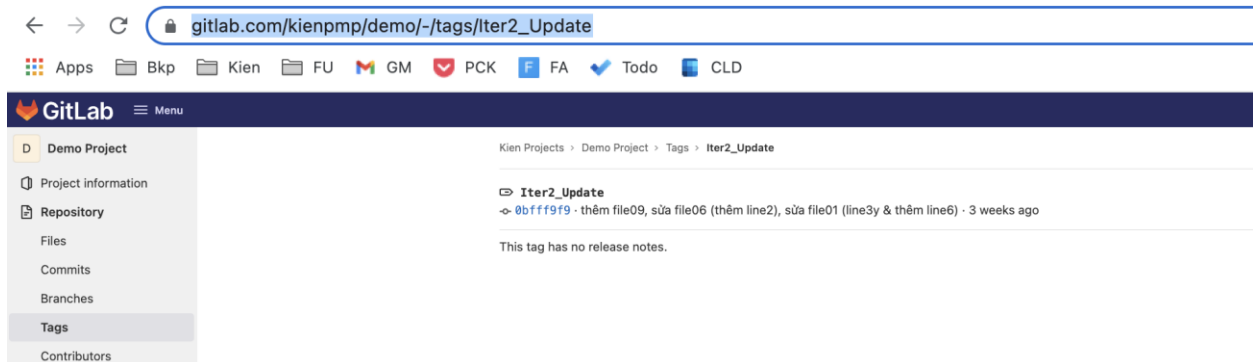
Create new tag (point to latest codes in the iter2 branch) like below



The screenshot shows the 'New Tag' form in GitLab. The 'Tag name' field is filled with 'Iter2_Update'. The 'Create from' dropdown is set to 'iter2'. The 'Message' field is empty. Below the message field, there is a note: 'Optionally, add a message to the tag. Leaving this blank creates a lightweight tag.' The 'Release notes' section is also visible, with a 'Write' tab selected and a text area for notes. At the bottom, there are 'Create tag' and 'Cancel' buttons.

You can attach extra file (i.e database script) with “Attach a file”

b. Copy tagged code link form Address box



The screenshot shows the 'Iter2_Update' tag page in GitLab. The address bar shows the URL 'gitlab.com/kienpmp/demo/-/tags/Iter2_Update'. The page displays the tag name 'Iter2_Update' and the commit hash '0bfff9f9'. Below this, it shows the commit message: 'thêm file09, sửa file06 (thêm line2), sửa file01 (line3y & thêm line6) · 3 weeks ago'. At the bottom, it states 'This tag has no release notes.'