# Introduction to Git



# Agenda

- Git
- GitHub
- Git CLI
- Git GUI



# Git

- What is Git?
  - Version Control System

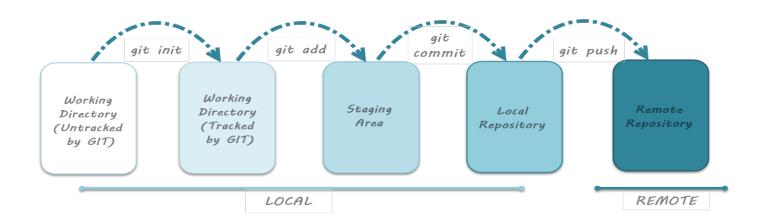
# Git

- Why use Git?
  - Source Code Tracking
  - Team Work Development



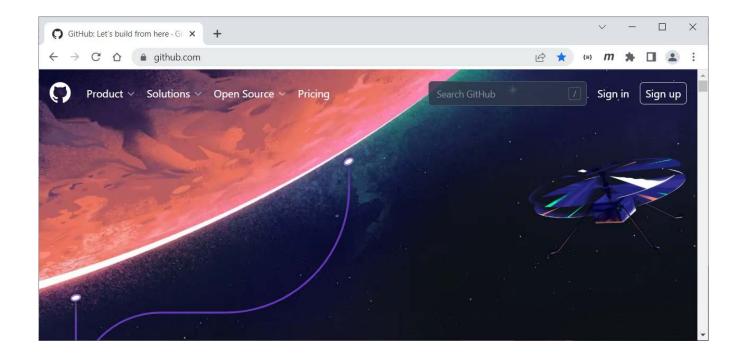
# Git

- Git State
  - Untracked
  - Working Directory
  - Staged
  - Local Repository
  - Remote Repository

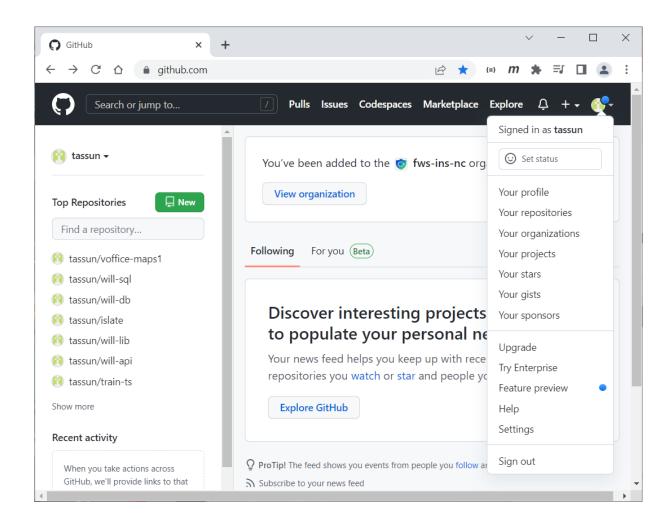


- What is GitHub?
  - Web site for Git
  - Control version repository

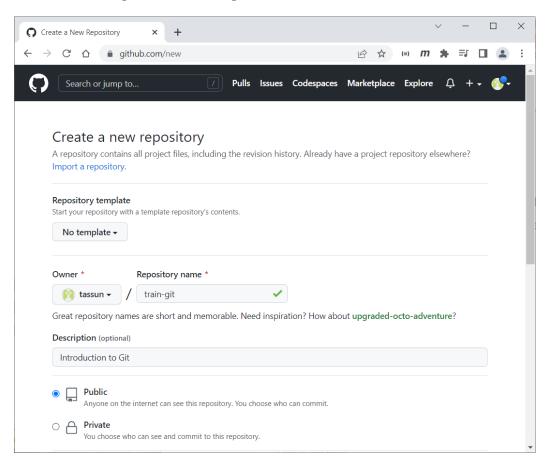
- How to use GitHub?
  - Go to https://github.com
  - Create account (Sign up)



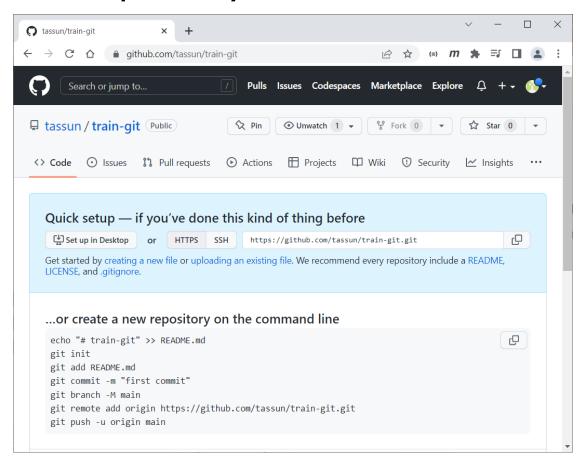
• How to use GitHub?



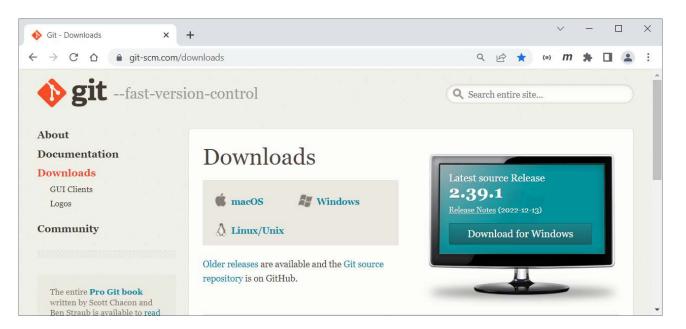
- How to use GitHub?
  - Create repository



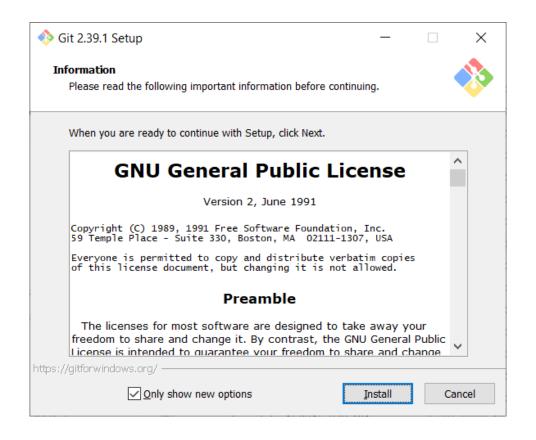
- How to use GitHub?
  - Create repository



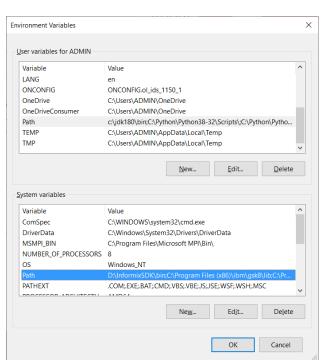
- How to use Git?
  - Go to https://git-scm.com/
  - Download & Install
    - https://git-scm.com/downloads



- Git Installation
  - windows



- Git Installation
  - windows portable
    - Settings -> Advanced system settings
      - System Properties -> Advanced -> Environment Variables
        - set PATH



- Git Command
  - git --version or git -v
  - git help , git help <command>

```
Microsoft Windows [Version 10.0.19044.1889]
(c) Microsoft Corporation. All rights reserved.

C:\Users\ADMIN>git --version
git version 2.39.1.windows.1

C:\Users\ADMIN>git -v
git version 2.39.1.windows.1

C:\Users\ADMIN>
```

- Git Command
  - git config
    - git config --global user.name your-name
    - git config --global user.email your-email
    - git config --global --list

```
Command Prompt
                                                                            D:\TrainingGit\train-git>git config --global user.name tassun oro
D:\TrainingGit\train-git>git config --global user.email tassun oro@hotmail.com
D:\TrainingGit\train-git>git config --global --list
filter.lfs.clean=git-lfs clean -- %f
filter.lfs.smudge=git-lfs smudge -- %f
filter.lfs.process=git-lfs filter-process
filter.lfs.required=true
user.name=tassun oro
user.email=tassun oro@hotmail.com
http.sslverify=false
difftool.sourcetree.cmd='' "$LOCAL" "$REMOTE"
mergetool.sourcetree.cmd=''
mergetool.sourcetree.trustexitcode=true
init.defaultbranch=master
D:\TrainingGit\train-git>
```

- Git Command
  - git init
    - create .git folder store local changed
  - git status

```
D:\TrainingGit\train-git>git init
Initialized empty Git repository in D:/TrainingGit/train-git/.git/

D:\TrainingGit\train-git>git status
On branch master

No commits yet

nothing to commit (create/copy files and use "git add" to track)

D:\TrainingGit\train-git>
```

- Git Command
  - git add
    - git add file-name
    - git add . or git add \*.txt
  - git status

- Git Command
  - git commit
    - git commit –m your-messages
  - git log

```
D:\TrainingGit\train-git\git commit -m "add readme"

[master (root-commit) ea0c779] add readme

1 file changed, 11 insertions(+)
create mode 100644 readme.md

D:\TrainingGit\train-git\git log
commit ea0c779d67521c927ba065b9e48b0f2703386b18 (HEAD -> master)
Author: tassun_oro <tassun_oro@hotmail.com>
Date: Sun Jan 22 11:07:14 2023 +0700

add readme

D:\TrainingGit\train-git>_
```

- Git Command
  - git branch
    - create
      - git branch branch-name
    - move/rename
      - git branch –M new-branch-name
    - delete
      - git branch -D branch-name
    - switch/change
      - git checkout branch-name

- Git Command
  - git branch

```
Command Prompt
                                                          X
D:\TrainingGit\train-git>git branch
* master
D:\TrainingGit\train-git>git branch -v
 master ea0c779 add readme
D:\TrainingGit\train-git>git branch tester
D:\TrainingGit\train-git>git branch
 master
  tester
D:\TrainingGit\train-git>git branch -M tester testing
D:\TrainingGit\train-git>git branch
 master
  testing
D:\TrainingGit\train-git>git branch -D testing
Deleted branch testing (was ea0c779).
D:\TrainingGit\train-git>_
```

- Git Command
  - git branch

```
D:\TrainingGit\train-git>git branch tester

D:\TrainingGit\train-git>git branch

* master
    tester

D:\TrainingGit\train-git>git checkout tester

Switched to branch 'tester'

D:\TrainingGit\train-git>git branch
    master

* tester

D:\TrainingGit\train-git>git branch
    master

* tester

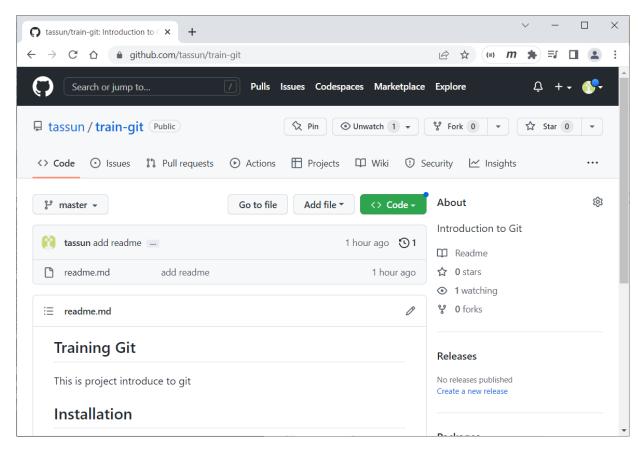
D:\TrainingGit\train-git>
```

- Git Command
  - git push
    - git remote add origin https://github.com/username/repo-name.git
    - git push -u origin master

- Git Command
  - git push
    - git config --global http.sslVerify false

```
Command Prompt
                                                                                       D:\TrainingGit\train-git>git config --global http.sslVerify false
D:\TrainingGit\train-git>git push -u origin master
                        -- SECURITY WARNING
warning: | TLS certificate verification has been disabled! |
warning: HTTPS connections may not be secure. See https://aka.ms/gcm/tlsverify for more inform
                       --- SECURITY WARNING -
warning: | TLS certificate verification has been disabled! |
warning: HTTPS connections may not be secure. See https://aka.ms/gcm/tlsverify for more inform
info: please complete authentication in your browser...
warning: ----- SECURITY WARNING -
warning: | TLS certificate verification has been disabled! |
warning: HTTPS connections may not be secure. See https://aka.ms/gcm/tlsverify for more inform
                    ---- SECURITY WARNING -
warning: | TLS certificate verification has been disabled! |
warning: HTTPS connections may not be secure. See https://aka.ms/gcm/tlsverify for more inform
ation.
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\% (3/3), 355 bytes | 177.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/tassun/train-git.git
* [new branch] master → master
branch 'master' set up to track 'origin/master'.
D:\TrainingGit\train-git>
```

- Git Command
  - git push

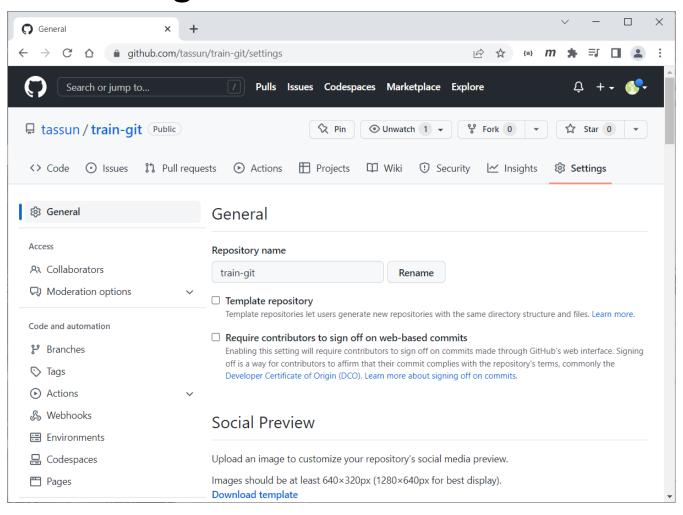


- Git Command
  - git clone
    - git clone https://github.com/user-name/repo-name.git

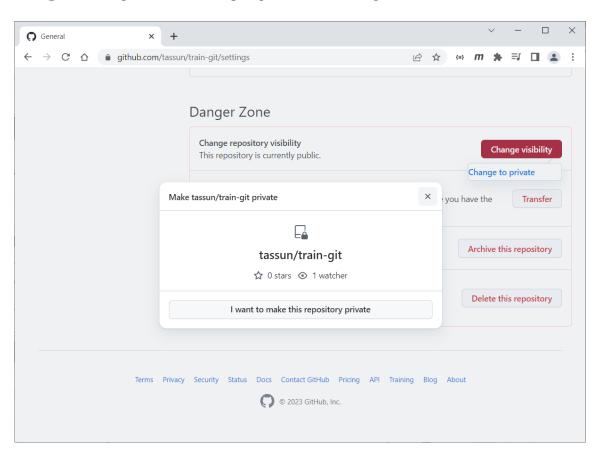
```
D:\TrainingGit\clone>git clone https://github.com/tassun/train-git.git Cloning into 'train-git'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 3 (delta 0), pack-reused 0
Receiving objects: 100% (3/3), done.

D:\TrainingGit\clone>_
```

GitHub Setting

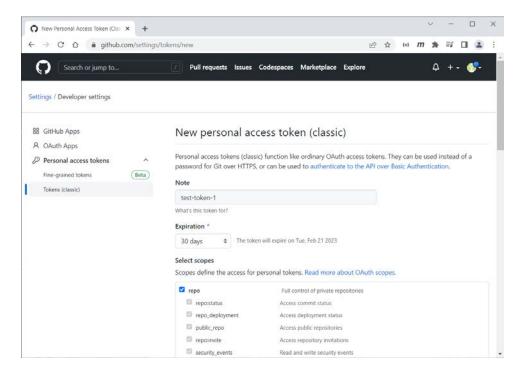


- GitHub Setting
  - try to change repository private/public





- Create Personal Access Token on GitHub
  - Settings -> Developer Settings
    - Person access tokens -> Tokens (classic)
      - Generate new token



- Git Command
  - git hub token
    - git clone https://user-name:githubtoken@github.com/user-name/repo-name.git

- Git Command
  - git hub token
    - try to edit readme.md then commit & push changed

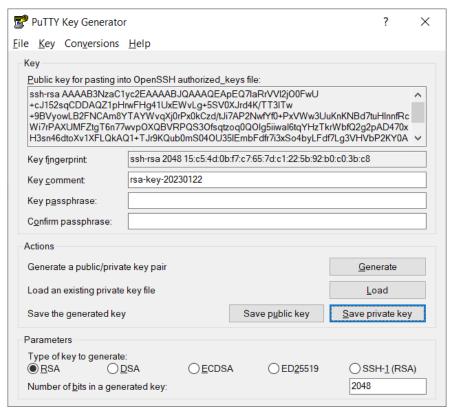
```
Command Prompt
                                                                                           D:\TrainingGit\train-git>git commit -a -m "add more info"
[master f2420c7] add more info
1 file changed, 6 insertions(+)
D:\TrainingGit\train-git>git remote set-url --push origin https://tassun:ghp pnA9Hs08yWkusv8FqM8
tktLNVFxIYL4Tu6S1@github.com/tassun/train-git.git
D:\TrainingGit\train-git>git push -u origin master
               ---- SECURITY WARNING
warning: | TLS certificate verification has been disabled! |
warning: HTTPS connections may not be secure. See https://aka.ms/gcm/tlsverify for more informat
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), 298 bytes | 298.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/tassun/train-git.git
   ea0c779..f2420c7 master -> master
branch 'master' set up to track 'origin/master'.
D:\TrainingGit\train-git>_
```



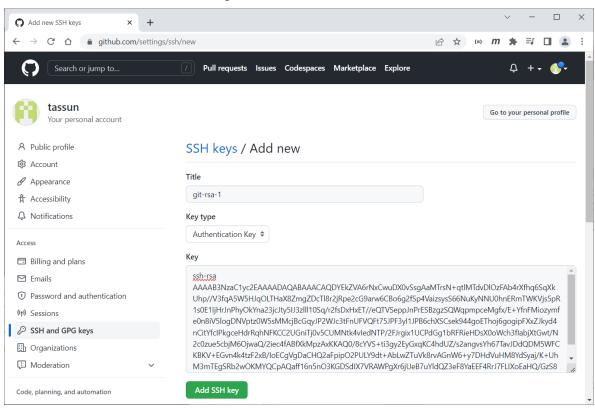
- Git Command
  - git ssh key
    - ssh-keygen -t rsa -b 4096 -C "email@example.com"

```
Command Prompt
                                                                            \times
D:\TrainingGit\train-git>ssh-keygen -t rsa -b 4096 -C tassun_oro@hotmail.com
Generating public/private rsa key pair.
Enter file in which to save the key (C:\Users\ADMIN/.ssh/id rsa): test git rsa
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in test_git_rsa.
Your public key has been saved in test git rsa.pub.
The key fingerprint is:
SHA256:oSWOeSekOO+3Lcoqqoo6JS6NN+ENV2b8OqVwn+pf2n8 tassun_oro@hotmail.com
The key's randomart image is:
 ---[RSA 4096]----
      .00
D:\TrainingGit\train-git>
```

- Git Command
  - git ssh key
    - putty key generator



- Add new SSH keys on GitHub
  - Settings -> SSH and GPG keys
    - SSH keys -> New SSH key



- Git Command
  - git ssh key testing

```
D:\TrainingGit\train-git>ssh -T git@github.com

Hi tassun! You've successfully authenticated, but GitHub does not provide shell access.

D:\TrainingGit\train-git>_____
```

- Git Command
  - git ssh key
    - try to clone with ssh

```
D:\TrainingGit\clone\git clone git@github.com:tassun/train-git.git
Cloning into 'train-git'...
remote: Enumerating objects: 6, done.
remote: Counting objects: 100% (6/6), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 6 (delta 1), reused 6 (delta 1), pack-reused 0
Receiving objects: 100% (6/6), done.
Resolving deltas: 100% (1/1), done.

D:\TrainingGit\clone>
```

- Git Command
  - git ssh key
    - try to edit readme.md then commit & push changed

```
Command Prompt
                                                                            \times
D:\TrainingGit\train-git>git commit -a -m "add more info"
[master b8calfd] add more info
1 file changed, 4 insertions(+)
D:\TrainingGit\train-git>git remote set-url --push origin git@github.com:tassun/
train-git.git
D:\TrainingGit\train-git>git push -u origin master
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), 284 bytes | 284.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:tassun/train-git.git
  f2420c7..b8calfd master -> master
branch 'master' set up to track 'origin/master'.
D:\TrainingGit\train-git>
```

- Git Command
  - git fetch

```
D:\TrainingGit\train-git>git fetch
remote: Enumerating objects: 4, done.
remote: Counting objects: 100% (4/4), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 3 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 1.50 MiB | 4.59 MiB/s, done.
From https://github.com/tassun/train-git
    5d0d364..1b253b4 master -> origin/master

D:\TrainingGit\train-git>_______
```

- Git Command
  - git merge

```
Command Prompt
                                                     X
D:\TrainingGit\train-git>git branch
* master
D:\TrainingGit\train-git>git branch tester
D:\TrainingGit\train-git>git branch
* master
  tester
D:\TrainingGit\train-git>git checkout tester
Switched to branch 'tester'
D:\TrainingGit\train-git>git branch
  master
* tester
D:\TrainingGit\train-git>_
```

- Git Command
  - git merge

```
D:\TrainingGit\train-git>git add testme.txt

D:\TrainingGit\train-git>git commit -m "add test me"

[tester 8010551] add test me
1 file changed, 2 insertions(+)
create mode 100644 testme.txt

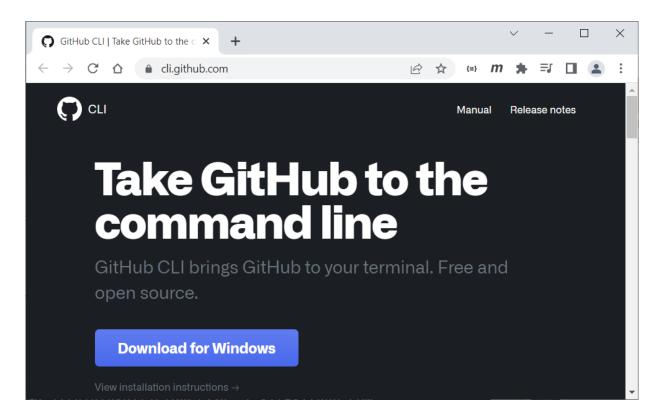
D:\TrainingGit\train-git>
```

```
Command Prompt
                                                               ×
D:\TrainingGit\train-git>git branch
 master
* tester
D:\TrainingGit\train-git>git checkout master
Switched to branch 'master'
Your branch is up to date with 'origin/master'.
D:\TrainingGit\train-git>git branch
  tester
D:\TrainingGit\train-git>git merge tester
Updating 67bedb6..8010551
Fast-forward
 testme.txt | 2 ++
1 file changed, 2 insertions (+)
 create mode 100644 testme.txt
D:\TrainingGit\train-git>_
```

- Git Command
  - git pull (fetch + merge)

```
Command Prompt
                                                                            \times
D:\TrainingGit\train-git>git status
On branch master
Your branch is behind 'origin/master' by 2 commits, and can be fast-forwarded.
  (use "git pull" to update your local branch)
nothing to commit, working tree clean
D:\TrainingGit\train-git>git pull
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 3 (delta 1), pack-reused 0
Unpacking objects: 100% (3/3), 94.53 KiB | 620.00 KiB/s, done.
From https://github.com/tassun/train-git
   1b253b4..2ea9ed7 master → origin/master
Updating b8calfd..2ea9ed7
Fast-forward
Introduction to Git.pdf | Bin 0 \rightarrow 1767462 bytes
readme.md
2 files changed, 3 insertions(+)
create mode 100644 Introduction to Git.pdf
D:\TrainingGit\train-git>
```

- GitHub CLI
  - Go to https://cli.github.com/
  - Download & Install



- GitHub CLI
  - try to login and clone

```
Command Prompt
                                                                      X
D:\TrainingGit\clone>gh auth login
 What account do you want to log into? GitHub.com
 What is your preferred protocol for Git operations? HTTPS
 Authenticate Git with your GitHub credentials? Yes
 How would you like to authenticate GitHub CLI? Login with a web browser
 First copy your one-time code: ADEB-F04E
Press Enter to open github.com in your browser...
 Authentication complete.
 gh config set -h github.com git protocol https
 Configured git protocol
 Logged in as tassun
D:\TrainingGit\clone>gh repo clone tassun/train-git
Cloning into 'train-git'...
remote: Enumerating objects: 27, done.
remote: Counting objects: 100% (27/27), done.
remote: Compressing objects: 100% (16/16), done.
remote: Total 27 (delta 7), reused 26 (delta 6), pack-reused 0
ects: 81% (22/27), 1.43 MiB | 1.25 MiB/s
Receiving objects: 100% (27/27), 1.87 MiB | 1.41 MiB/s, done.
Resolving deltas: 100% (7/7), done.
D:\TrainingGit\clone>_
```

- GitHub CLI
  - list repository

```
X
Command Prompt
                                                                     D:\TrainingGit\clone\train-git>gh repo list
Showing 14 of 14 repositories in @tassun
tassun/train-git
                       Introduction to Git
                                                     public
                                                               1d
tassun/will-db
                                                     public
                                                               3d
tassun/train-ts
                       Introduction to TypeScript
                                                     public .
                                                               4d
                                                               5d
tassun/will-lib
                       Library classes
                                                     public.
                                                     public
tassun/will-sql
                       Simple SQL by place hold...
                                                               5d
tassun/will-run
                       Runner for moleculer ser...
                                                               6d
                                                     public
tassun/will-api
                                                               6d
                                                     public
tassun/islate
                       slate setting
                                                     private
                                                              Dec 22, 2022
tassun/express-dh
                       Express DH Project
                                                     public
tassun/will-dh
                       Diffie-Hellman Utilities
                                                     public
                                                              Nov 21, 2022
tassun/will-util
                       Utility functional
                                                              Nov 15.
                                                                       2022
                                                     public
tassun/voffice-mapsl
                                                     public
                                                               Mar
                                                                       2022
tassun/chat
                                                     public
                                                               Aug
                                                                       2021
tassun/mypurse
                                                     public
                                                               0ct
                                                                    5, 2017
D:\TrainingGit\clone\train-git>
```

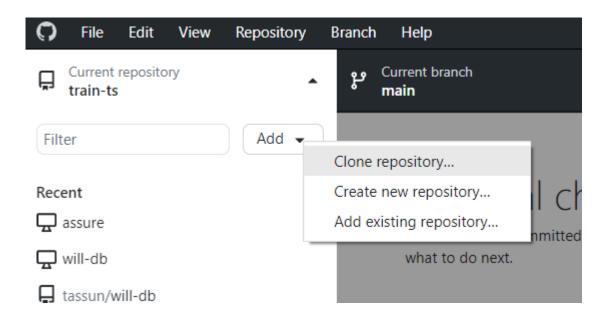
## Git GUI

- Git Desktop
  - Go to https://desktop.github.com/
  - Download & Install



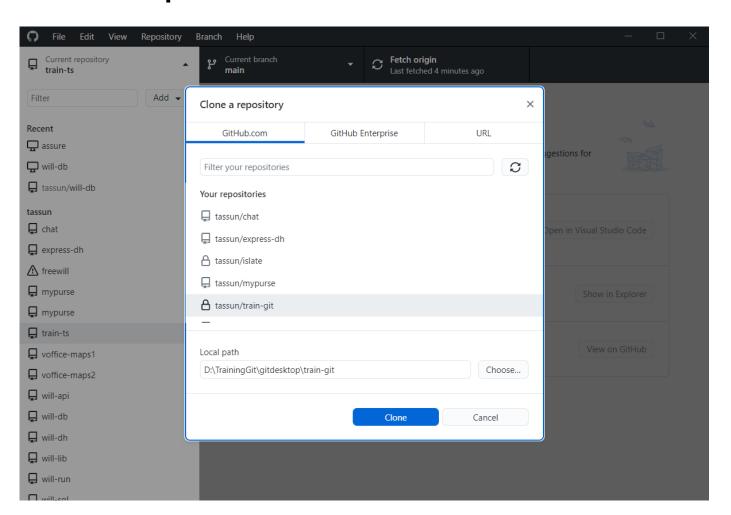
# Git GUI

Git Desktop



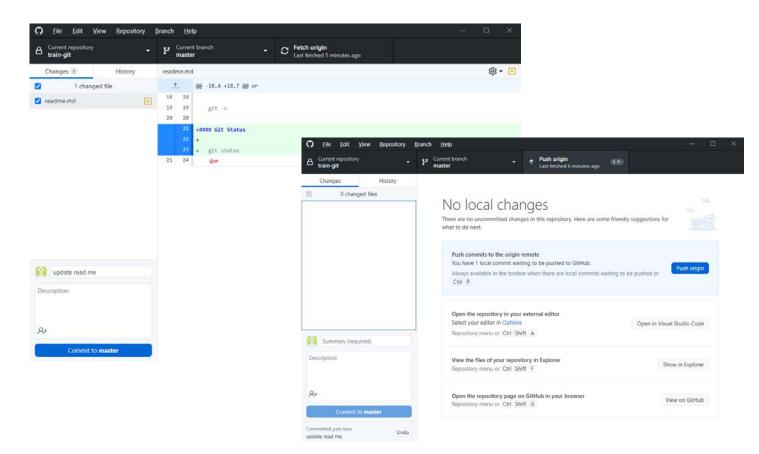
# Git GUI

Git Desktop





- Git Desktop
  - try to edit readme.md then commit & push





- https://devahoy.com/blog/2015/08/introdu ction-to-git-and-github
- https://km.cc.swu.ac.th/archives/3606
- https://saixiii.com/what-is-github/
- https://devahoy.com/blog/2017/12/howto-show-verify-sign-with-gpg
- https://docs.github.com/en/authentication/ connecting-to-github-with-ssh

