Git Tutorial

Introduction to Intelligent Systems

Robot Learning Lab

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
SEOUL NATIONAL UNIVERSITY

RLLAB
http://rllab.snu.ac.kr

Overview

- Introduction : What is Git?
- How does git work?
- Git Tutorial

Introduction

- **What is Git?**

- Git - Version Control System

- Github - Code hosting platform for version control and collaboration.

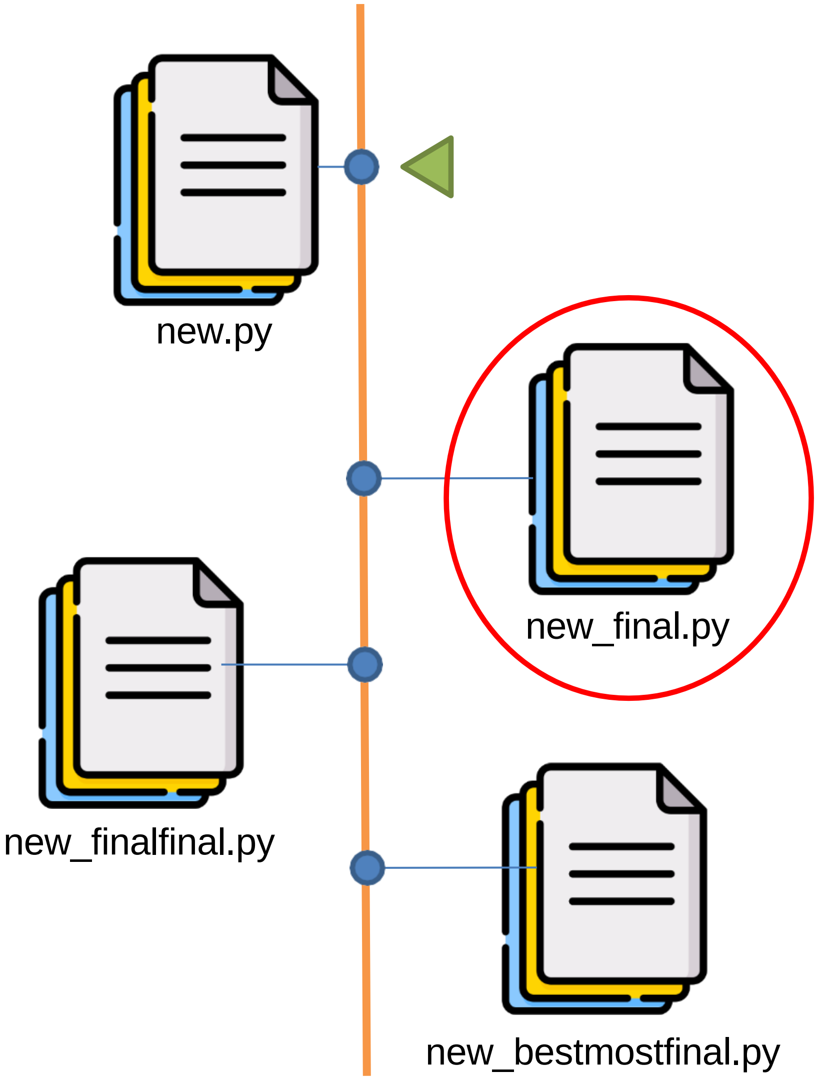
Introduction

- **Version Control**

- **Version control keeps record of your changes in codes**

- **Allows you to revert any changes and go back to a previous state**

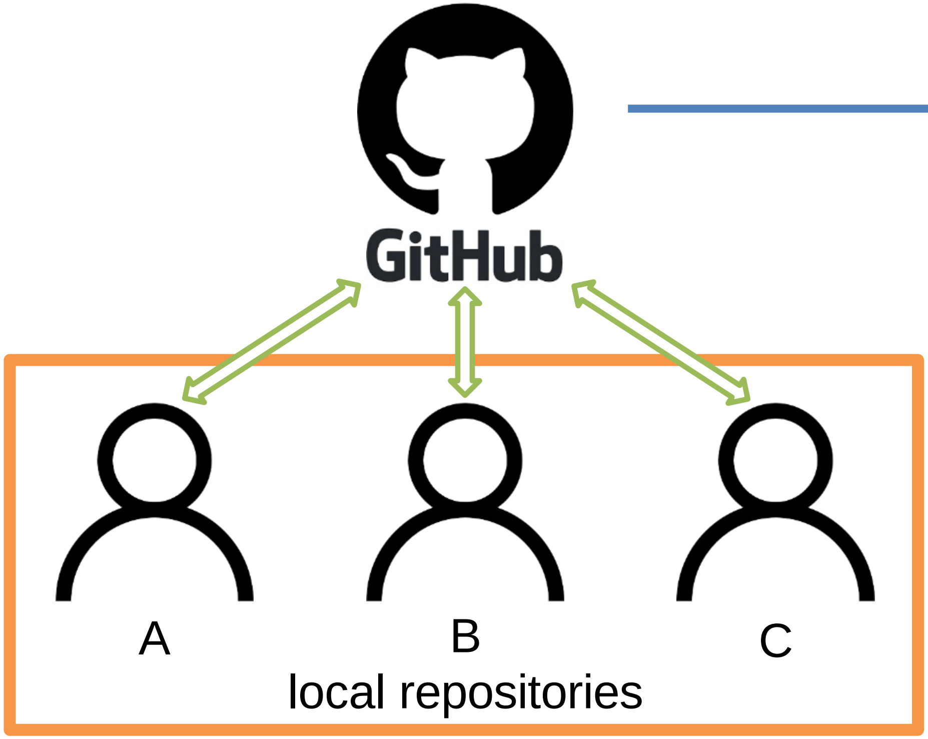
- **We can restore our previous codes!**



How does Git work?

- **Repository**

remote repository



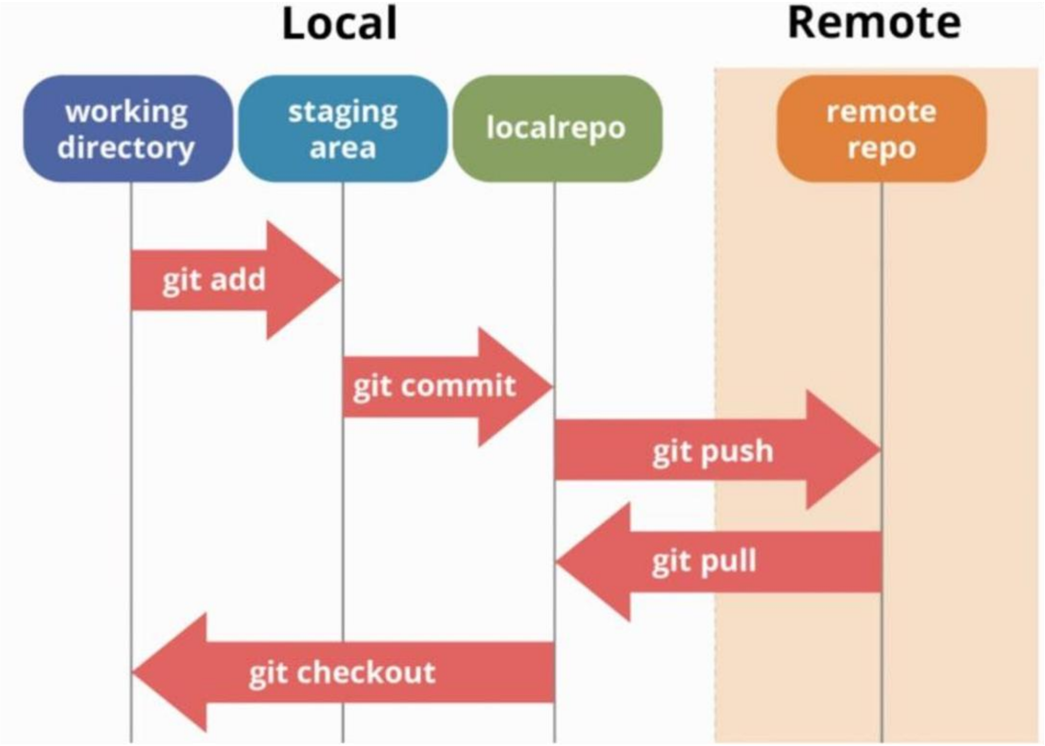
local repositories

Files are managed in remote server. Users can push(upload)/pull(download) files to this repository.

Local repository stores files in my local PC.

How does Git work?

- **Basic Git commands**



git init
create a new local repository

git remote add origin <server>
connect to a remote repository

git add [file]
adds a file to the staging area

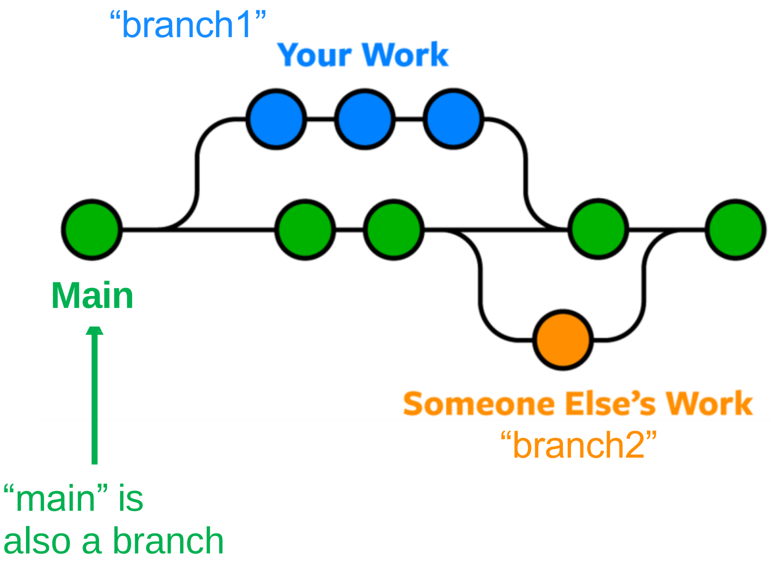
git commit –m “commit message”
records staged files in version history

git push origin <branchname>
sends commited changes of your branch to your remote repository

git pull origin <branchname>
update from the remote repository

How does Git work?

- **What is Branch?**



git branch
lists all the branches in your repo and show your current branch

git checkout –b <branchname>
create a new branch and switch to it

git checkout <branchname>
switch from one branch to another

git merge <branchname1> <branchname2>
adds a file to the staging area

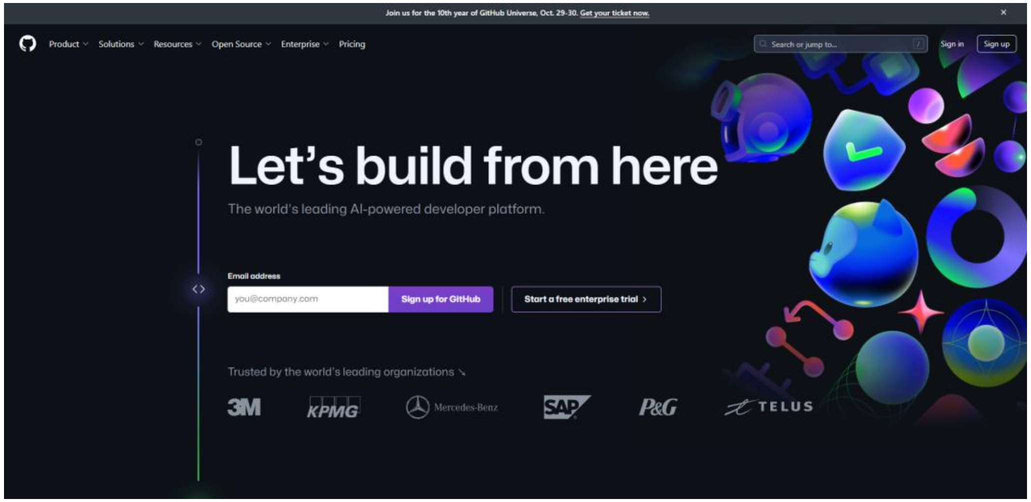
1) Install Git and create Github account

- Linux

```
sudo apt-get install git
```

- Create Github account

  https://github.com/



Join us for the 10th year of GitHub Universe, Oct. 29-30. Get your ticket now.

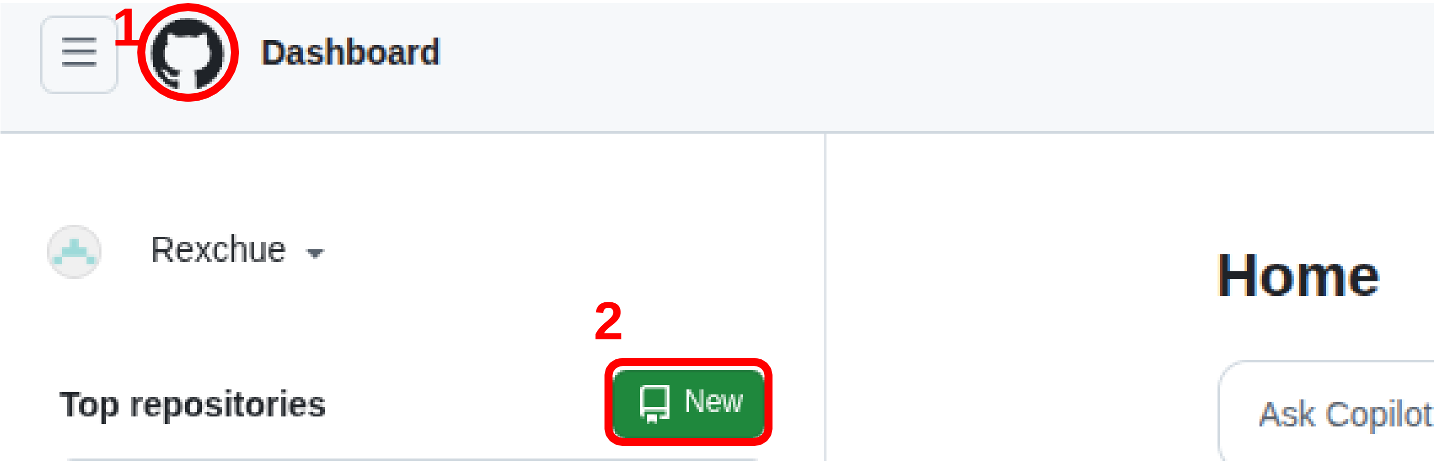
Let’s build from here

The world’s leading AI-powered developer platform.

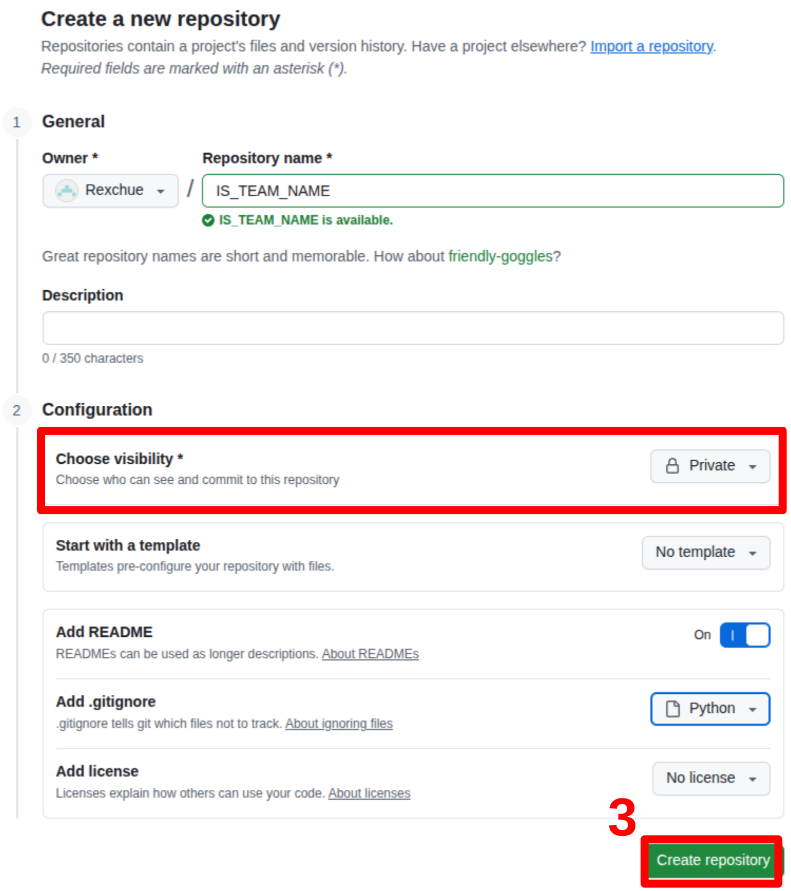
Trusted by the world’s leading organizations ↘

2) Make your own private repository

Github web page -> new repository



2) Make your own private repository



Create a new repository

Repositories contain a project's files and version history. Have a project elsewhere? Import a repository.
Required fields are marked with an asterisk (*).

1 **General**

Owner * Rexchue / **Repository name *** IS_TEAM_NAME

IS_TEAM_NAME is available.

Great repository names are short and memorable. How about friendly-goggles?

Description

0 / 350 characters

2 **Configuration**

Choose visibility * — Private
Choose who can see and commit to this repository

Start with a template — No template
Templates pre-configure your repository with files.

Add README — On
READMEs can be used as longer descriptions. About READMEs

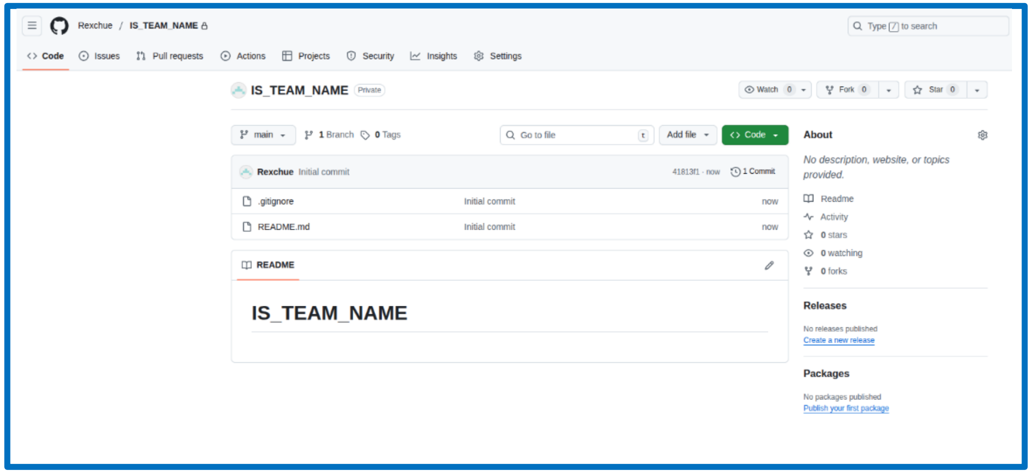
Add .gitignore — Python
.gitignore tells git which files not to track. About ignoring files

Add license — No license
Licenses explain how others can use your code. About licenses

3

Make sure to make your repository “private” so that other teams cannot view your team’s code. Repository name should follow IS_{TEAM_NAME} format. (e.g. IS_RLLAB)

Main page of your repository



Rexchue Initial commit 41813f1 · now 1 Commit

.gitignore	Initial commit	now
README.md	Initial commit	now

README

IS_TEAM_NAME

About

No description, website, or topics provided.

Readme
Activity
0 stars
0 watching
0 forks

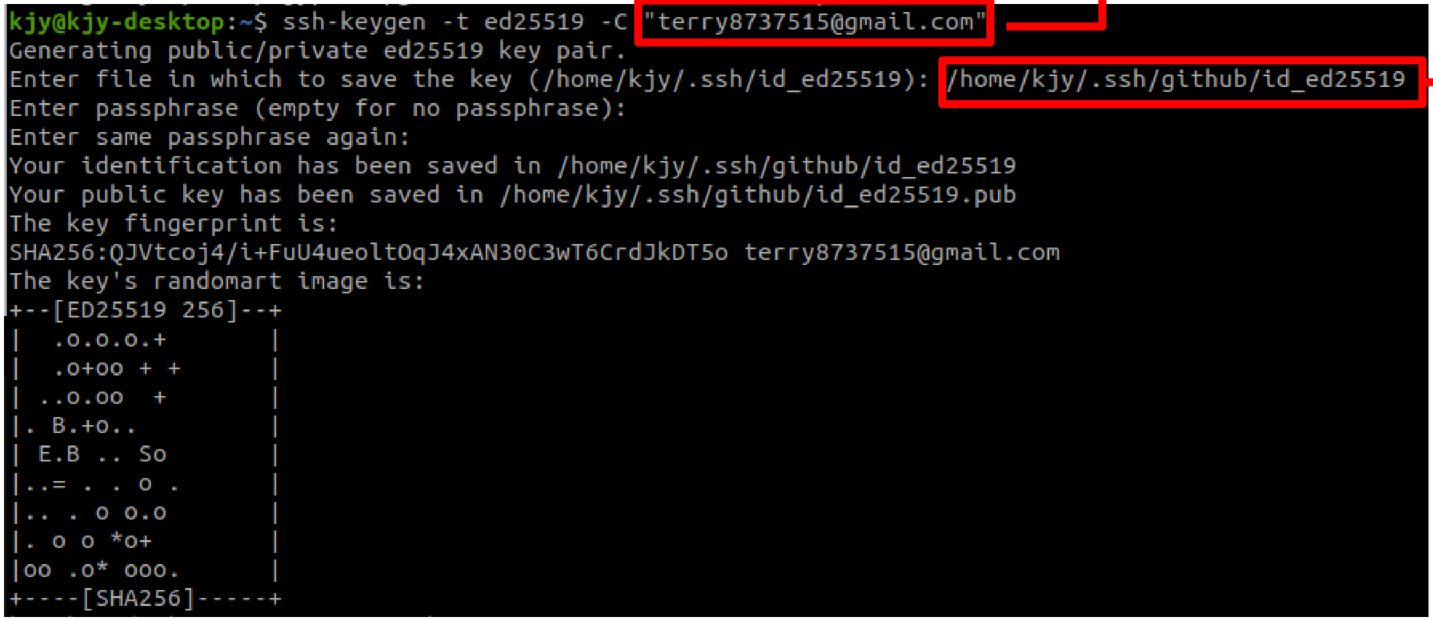
Releases

No releases published
Create a new release

Packages

No packages published
Publish your first package

3) Make your own ssh key



```
kjy@kjy-desktop:~$ ssh-keygen -t ed25519 -C "terry8737515@gmail.com"
Generating public/private ed25519 key pair.
Enter file in which to save the key (/home/kjy/.ssh/id_ed25519): /home/kjy/.ssh/github/id_ed25519
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/kjy/.ssh/github/id_ed25519
Your public key has been saved in /home/kjy/.ssh/github/id_ed25519.pub
The key fingerprint is:
SHA256:QJVtcoj4/i+FuU4ueoltOqJ4xAN30C3wT6CrdJkDT5o terry8737515@gmail.com
The key's randomart image is:
+--[ED25519 256]--+
|  .o.o.o.+       |
|  .o+oo + +      |
| ..o.oo  +       |
|. B.+o..         |
| E.B .. So       |
|..= . . o .      |
|.. . o o.o       |
|. o o *o+        |
|oo .o* ooo.      |
+----[SHA256]-----+
```

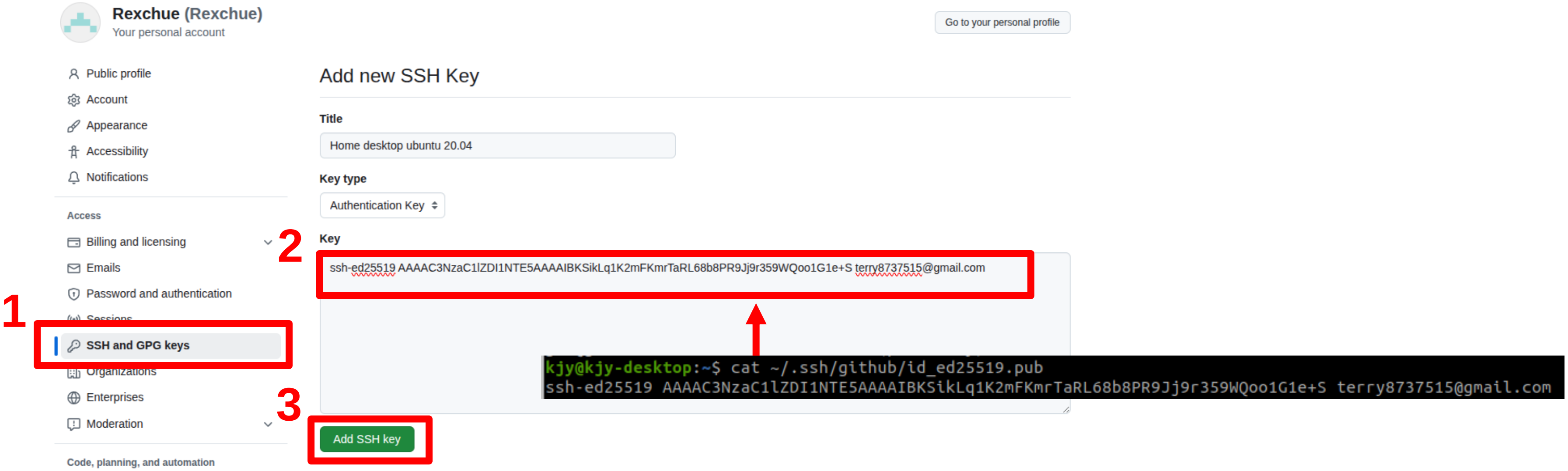
Your email

The path where your ssh key is. Usually it is ~/.ssh/id_ed255119

Directions for those who didn't save their ssh keys inside ~/.ssh/id_ed255119 (ex ~/.ssh/github/)

- Create a config file (~/.ssh/config) and type in the following
- Host github.com
  User git
  IdentityFile ~/.ssh/github/id_ed25519

4) Register your key to github



Add new SSH Key

Title

Home desktop ubuntu 20.04

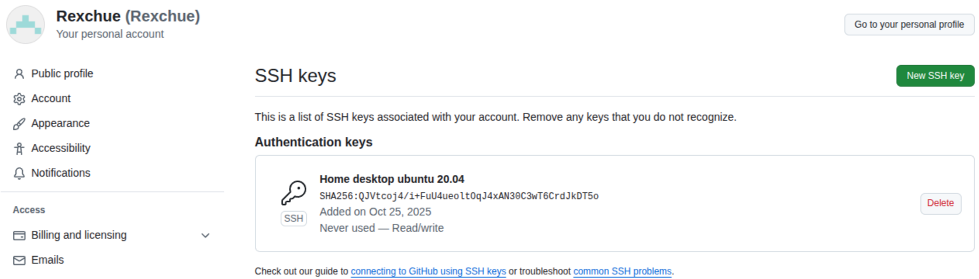
Key type

Authentication Key

Key

ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIBKSikLq1K2mFKmrTaRL68b8PR9Jj9r359WQoo1G1e+S terry8737515@gmail.com

```
kjy@kjy-desktop:~$ cat ~/.ssh/github/id_ed25519.pub
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIBKSikLq1K2mFKmrTaRL68b8PR9Jj9r359WQoo1G1e+S terry8737515@gmail.com
```



SSH keys

This is a list of SSH keys associated with your account. Remove any keys that you do not recognize.

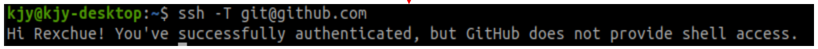
Authentication keys

Home desktop ubuntu 20.04
SHA256:QJVtcoj4/i+FuU4ueoltOqJ4xAN30C3wT6CrdJkDT5o
Added on Oct 25, 2025
Never used — Read/write

Check out our guide to connecting to GitHub using SSH keys or troubleshoot common SSH problems.

Your registered key should appear as above

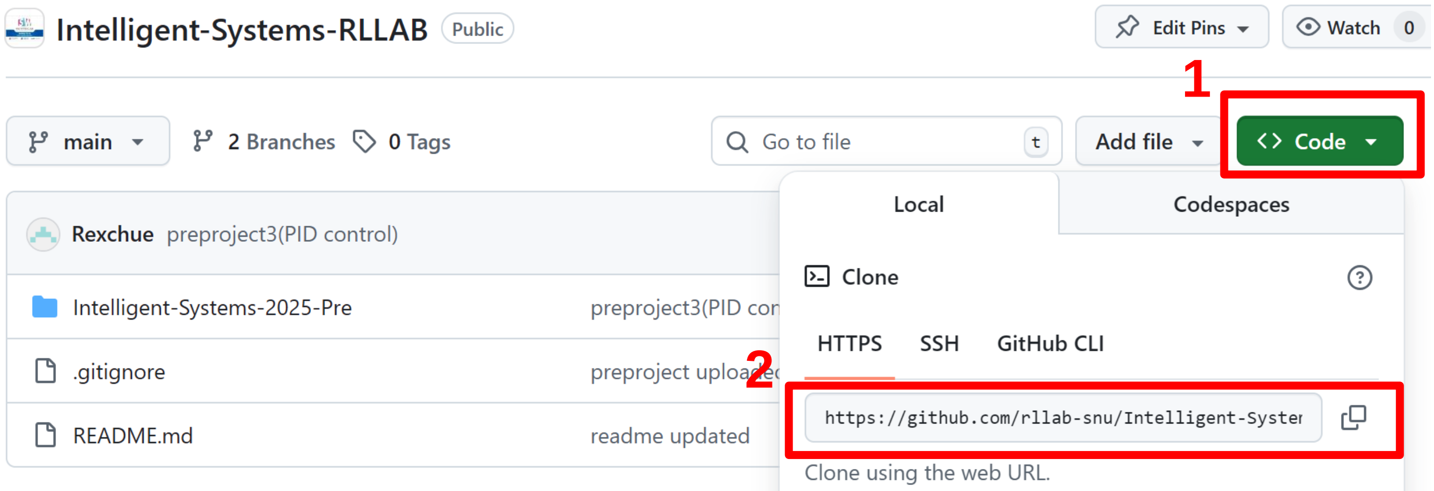
Finally type the command as below and verify your key



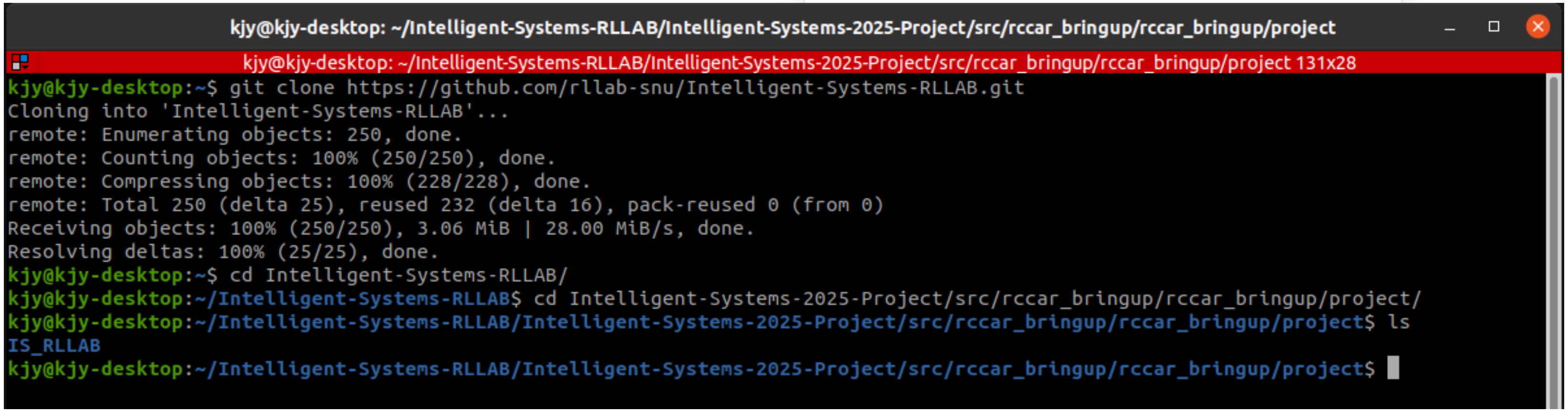
```
kjy@kjy-desktop:~$ ssh -T git@github.com
Hi Rexchue! You've successfully authenticated, but GitHub does not provide shell access.
```

5) Pull Intelligent-Systems-RLLAB repository on your local PC

git pull (this should work if you initially cloned our repository) or else clone by following the below picture



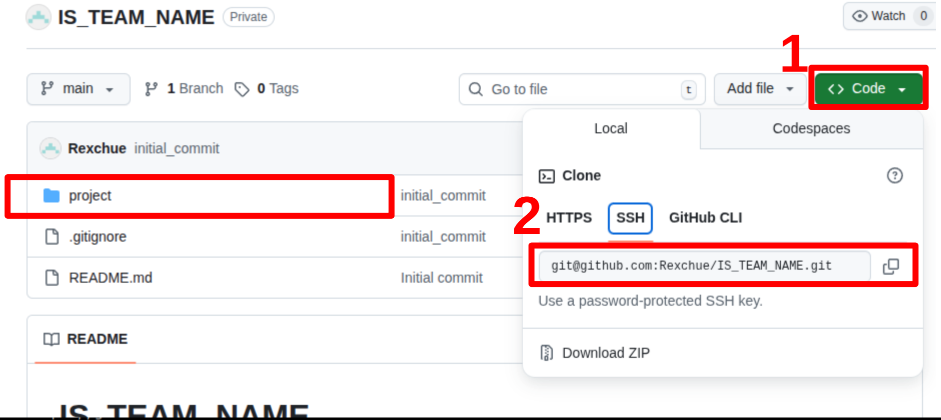
https://github.com/rllab-snu/Intelligent-Syster


kjy@kjy-desktop: ~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project
kjy@kjy-desktop: ~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project 131x28

```
kjy@kjy-desktop:~$ git clone https://github.com/rllab-snu/Intelligent-Systems-RLLAB.git
Cloning into 'Intelligent-Systems-RLLAB'...
remote: Enumerating objects: 250, done.
remote: Counting objects: 100% (250/250), done.
remote: Compressing objects: 100% (228/228), done.
remote: Total 250 (delta 25), reused 232 (delta 16), pack-reused 0 (from 0)
Receiving objects: 100% (250/250), 3.06 MiB | 28.00 MiB/s, done.
Resolving deltas: 100% (25/25), done.
kjy@kjy-desktop:~$ cd Intelligent-Systems-RLLAB/
kjy@kjy-desktop:~/Intelligent-Systems-RLLAB$ cd Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project/
kjy@kjy-desktop:~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project$ ls
IS_RLLAB
kjy@kjy-desktop:~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project$ 
```

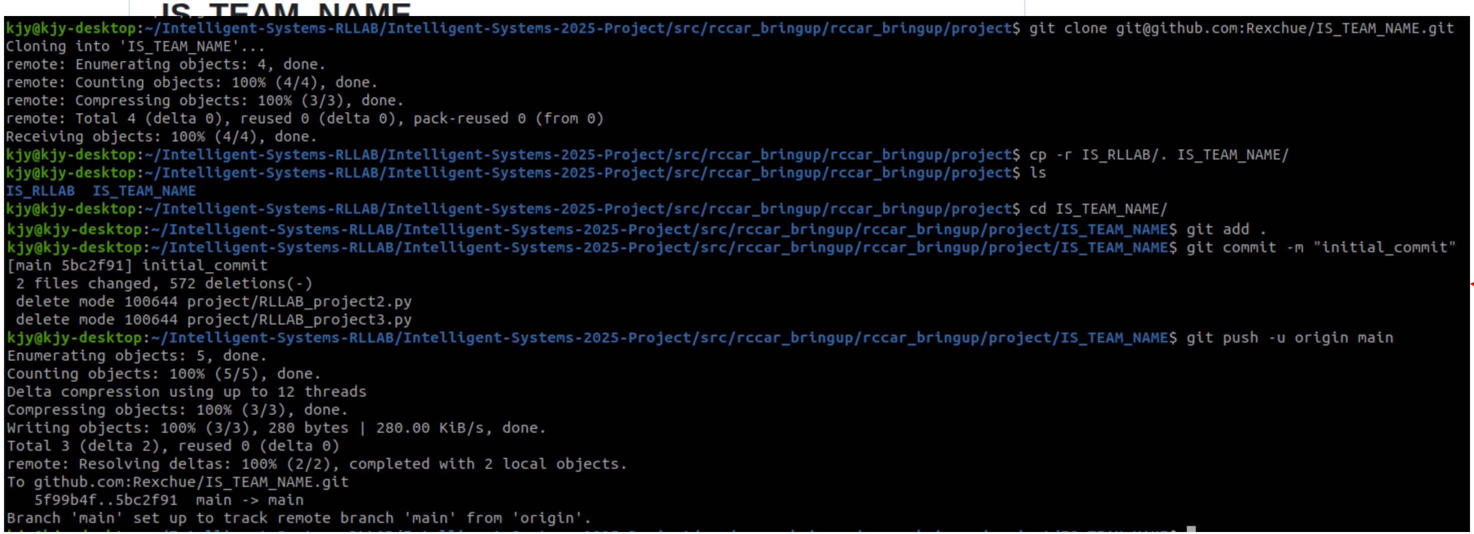
6) Clone your private IS_{TEAM_NAME} repo

Clone using ssh git clone git@github.com:{username}/IS_{TEAM_NAME}.git



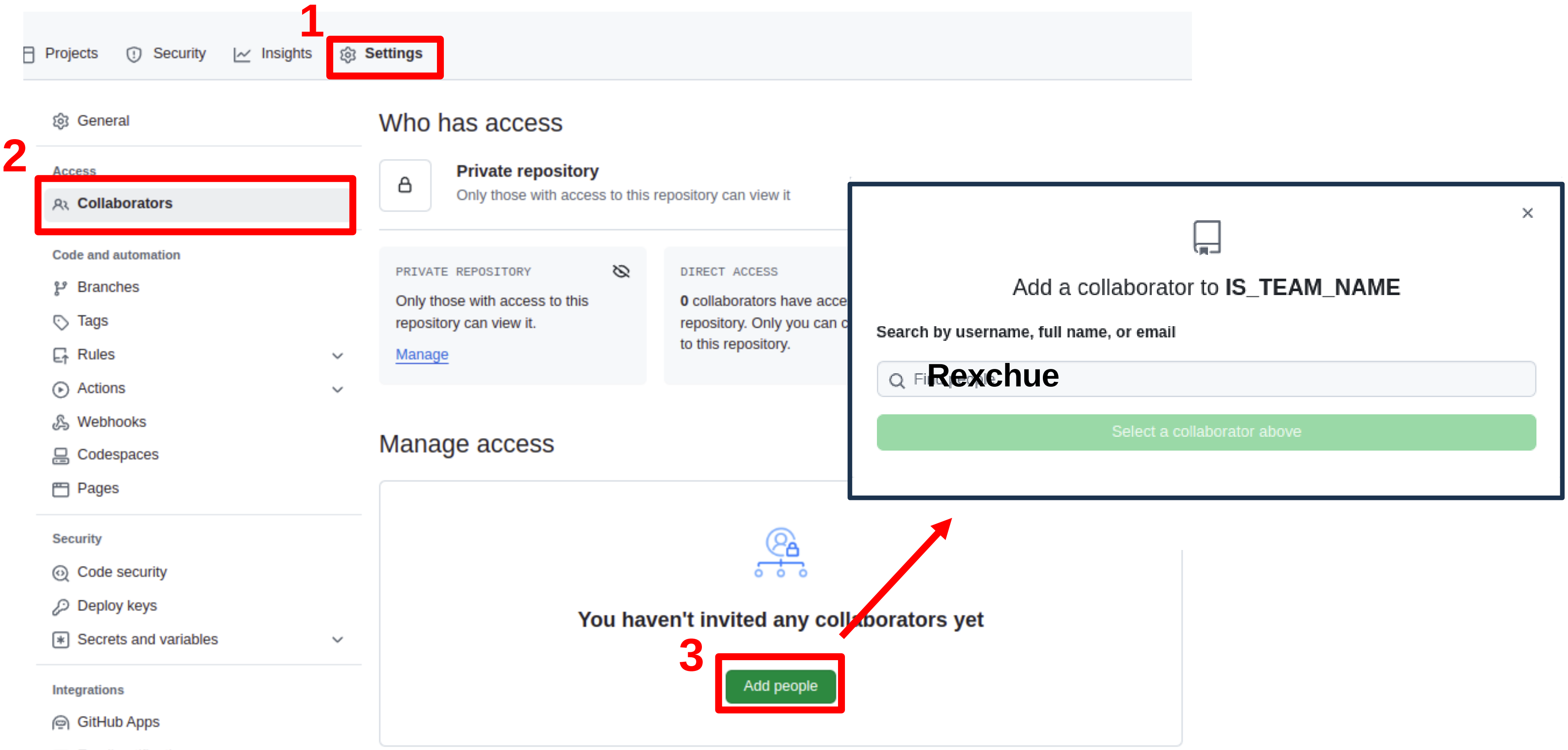
git@github.com:Rexchue/IS_TEAM_NAME.git

cp –r IS_RLLAB/. IS_TEAM_NAME/
cd IS_TEAM_NAME/
git add .
git commit –m “Initial Commit”
git push –u origin main



```
kjy@kjy-desktop:~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project$ git clone git@github.com:Rexchue/IS_TEAM_NAME.git
Cloning into 'IS_TEAM_NAME'...
remote: Enumerating objects: 4, done.
remote: Counting objects: 100% (4/4), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 4 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (4/4), done.
kjy@kjy-desktop:~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project$ cp -r IS_RLLAB/. IS_TEAM_NAME/
kjy@kjy-desktop:~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project$ ls
IS_RLLAB  IS_TEAM_NAME
kjy@kjy-desktop:~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project$ cd IS_TEAM_NAME/
kjy@kjy-desktop:~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project/IS_TEAM_NAME$ git add .
kjy@kjy-desktop:~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project/IS_TEAM_NAME$ git commit -m "initial_commit"
[main 5bc2f91] initial_commit
 2 files changed, 572 deletions(-)
 delete mode 100644 project/RLLAB_project2.py
 delete mode 100644 project/RLLAB_project3.py
kjy@kjy-desktop:~/Intelligent-Systems-RLLAB/Intelligent-Systems-2025-Project/src/rccar_bringup/rccar_bringup/project/IS_TEAM_NAME$ git push -u origin main
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 12 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 280 bytes | 280.00 KiB/s, done.
Total 3 (delta 2), reused 0 (delta 0)
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To github.com:Rexchue/IS_TEAM_NAME.git
   5f99b4f..5bc2f91  main -> main
Branch 'main' set up to track remote branch 'main' from 'origin'.
```

5) Add team members and TAs as collaborators



Who has access

Private repository
Only those with access to this repository can view it

PRIVATE REPOSITORY
Only those with access to this repository can view it.
Manage

DIRECT ACCESS
0 collaborators have acce
repository. Only you can c
to this repository.

Manage access

You haven't invited any collaborators yet

Add a collaborator to **IS_TEAM_NAME**

Search by username, full name, or email

Fi **Rexchue**

Select a collaborator above

Git Tutorial - Summary

6) Modify your codes!

```
# Upload your local codes to remote repository
git add .
git commit –m “commit message”
git push –u origin main

# Download remote repository’s codes to local PC
git pull origin main

# make branch
git checkout –b <branchname>
git merge <branchname1> <branchname2>

# undo local changes
git fetch origin
git reset –-hard origin/main
```

For more git commands, go to this link
https://confluence.atlassian.com/bitbucketserver/basic-git-commands-776639767.html

RLLAB
http://rllab.snu.ac.kr

Thank you