Remotes & Github

Working with a Remote Repo

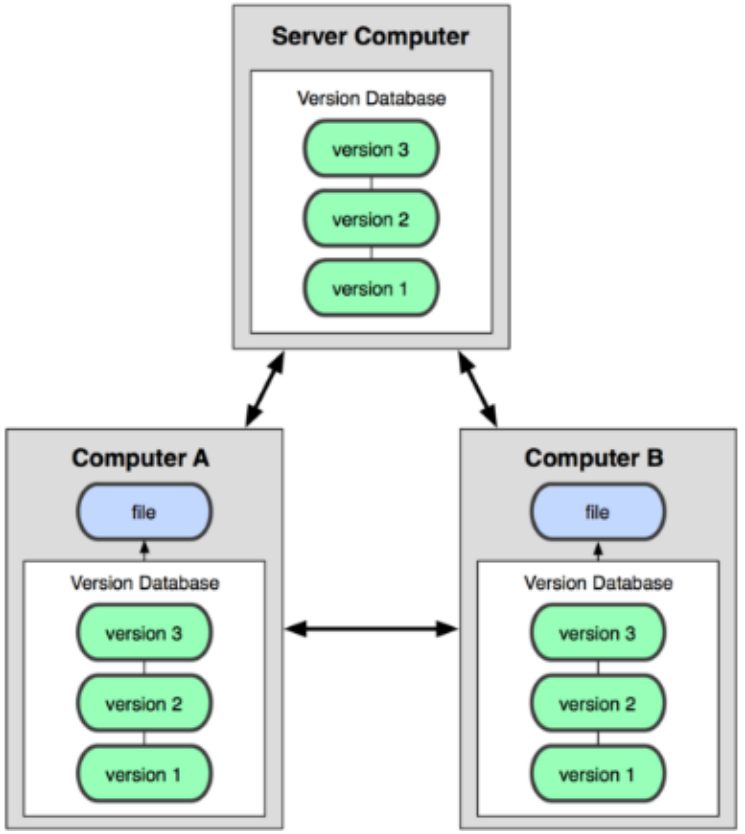
Git is a distributed version control system.

git was invented to manage the Linux kernel source code, with thousands of developers in over a hundred countries.

You can have many repositories on the net, called "remotes".

They may all be different!

No "master" repository
-- all repos are equal.



Git Hosting Sites

You can create free git repositories on these sites, for individual or team projects.

Github - https://github.com

Bitbucket - https://bitbucket.org

GitLab - https://gitlab.com

Commands for Remotes

Common commands for using a remote repo are:

`git clone` copy remote repo to your computer

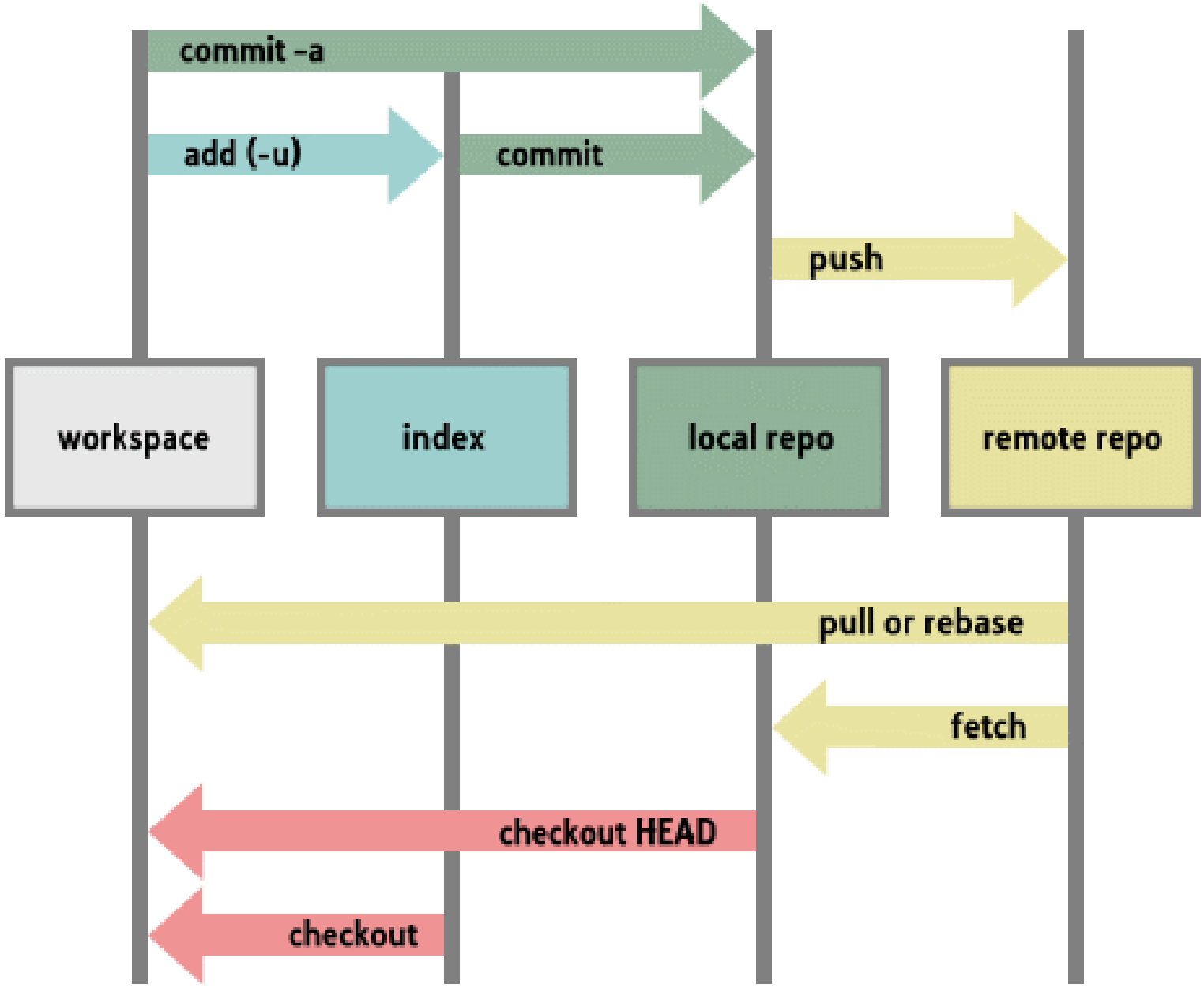
`git remote add` define URL of a remote repository

`git remote -v` list remotes, with URLS

`git push` "push" local updates to a remote

`git pull` download and merge remote updates

`git fetch` download remote updates, but don't merge into your working copy


commit -a
add (-u)
commit
push
workspace
index
local repo
remote repo
pull or rebase
fetch
checkout HEAD
checkout

What Github Does

- Online project hosting site.
- "Remote" git repository with access control
- Issue Tracking
- Project Boards
- Documentation and web pages (github.io)
- Integrates with other services
  - Travis CI for automatic testing

Github Profile

Example of SKE student profiles.

1. Real name
2. Photo
3. (Optional) Email
4. Description of you

Jirayu Laungwilawan
JirayuL

Faculty of Engineering , Major - Software and Knowledge Engineering.

Follow

Block or report user

Thailand
jirayu.l@ku.th
https://github.com/JirayuL

Kongpon Charanwattanakit
kykungz

Software Developer, Undergraduate Software and Knowledge Engineering Student

Follow

Block or report user

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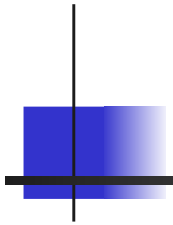


How to Use Github

Creating and using a Repository

Case 1: *Project code is on your local computer. You want to copy it to Github.*

Case 2: *Project already exists on Github. You want to copy it to your computer.*

Special Case:

Case 3: *A new project (no files yet).*

Case 1: Starting from Local Project

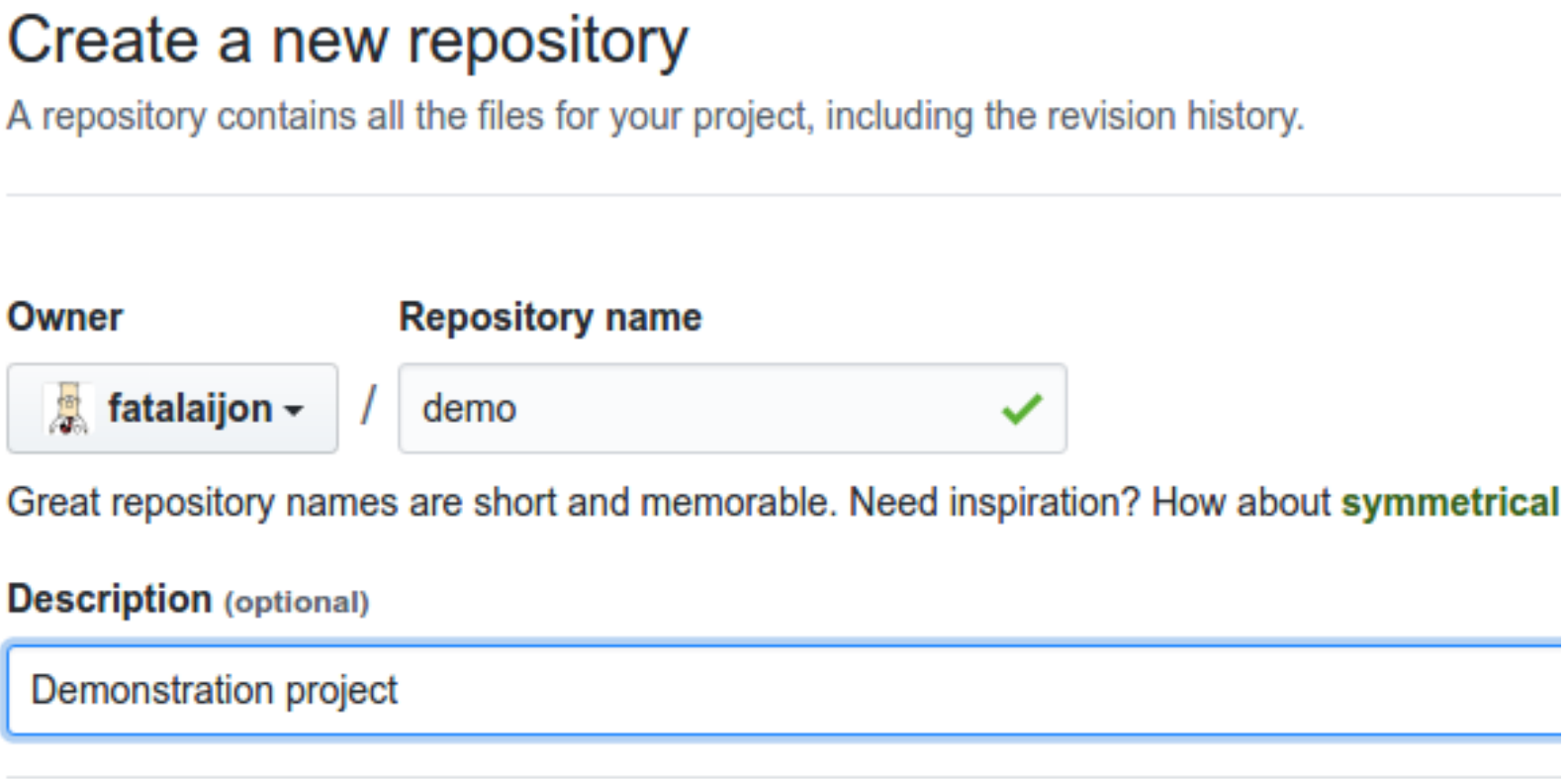
You already have a project on your computer

1. Create a local "git" repository.

```
cmd> git init

# These two files are typical

cmd> git add .gitignore README.md

# Add some source code

cmd> git add src/*.java (for example)

# Commit code to github

cmd> git commit -m "initial code checkin"
```

Case 1: Remote must be empty

2. Create an **empty** repository on Github.



Case 1: add Github as remote

3. Copy the URL of new Github repository (https or ssh).

4. In your local project, add Github as a remote repository named "origin":

```
cmd> git remote add origin
     https://github.com/fatalaijon/demo.git
```

5. Push (copy) the local repository to Github

```
cmd> git push -u origin master
```

You only need **"-u origin master"** the **first time** you push to Github. Next time, just type "**`git push`**".

Case 2: Starting from Github

A project already exists on Github.
You want to "clone" it your local computer.

1. Get the Github project URL
   `https://github.com/user/demo.git`

or: go to project on Github and click on 

and copy the URL.

2. In your workspace directory, type:

`cmd>` **`git clone https://github.com/user/demo`**

NOTE: "git clone" creates a new directory named "demo" inside your current directory. If this directory already exists, clone won't work.

Case 2: ready to use

That's it!

Github is automatically the remote named "`origin`".

Just "**`git push`**" your commited work to github.

You can use a different project name

The name of your local directory (cloned from Github) can be different from the Github repository name.

1) Specify local directory name when you "**clone**":

```
# Clone "demo" into local directory "mydemo"

cmd> git clone https://github.com/fatalai jon/demo.git  mydemo
```

Syntax: git clone *remote_url local_repo_name*

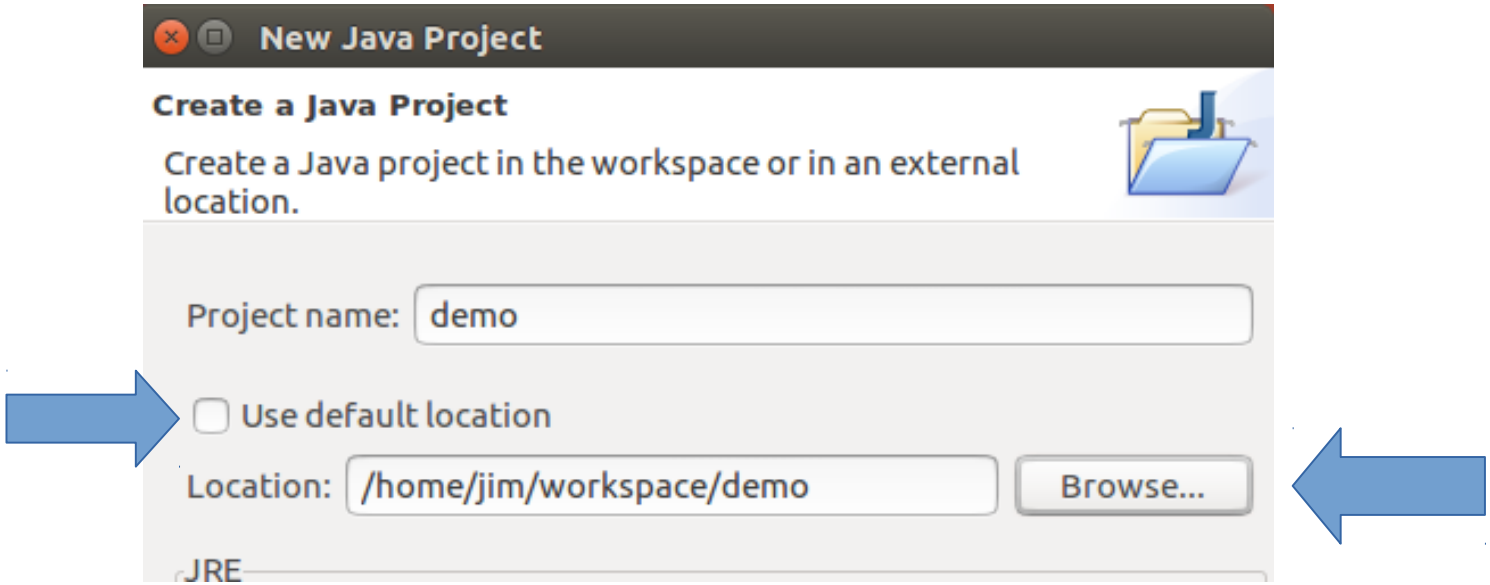
-- or --

2) or rename the directory yourself!

use the command line or any file manager

Eclipse create project with existing source

After cloning code from a remote, create an IDE project from "existing source code".



1. uncheck "use default location"

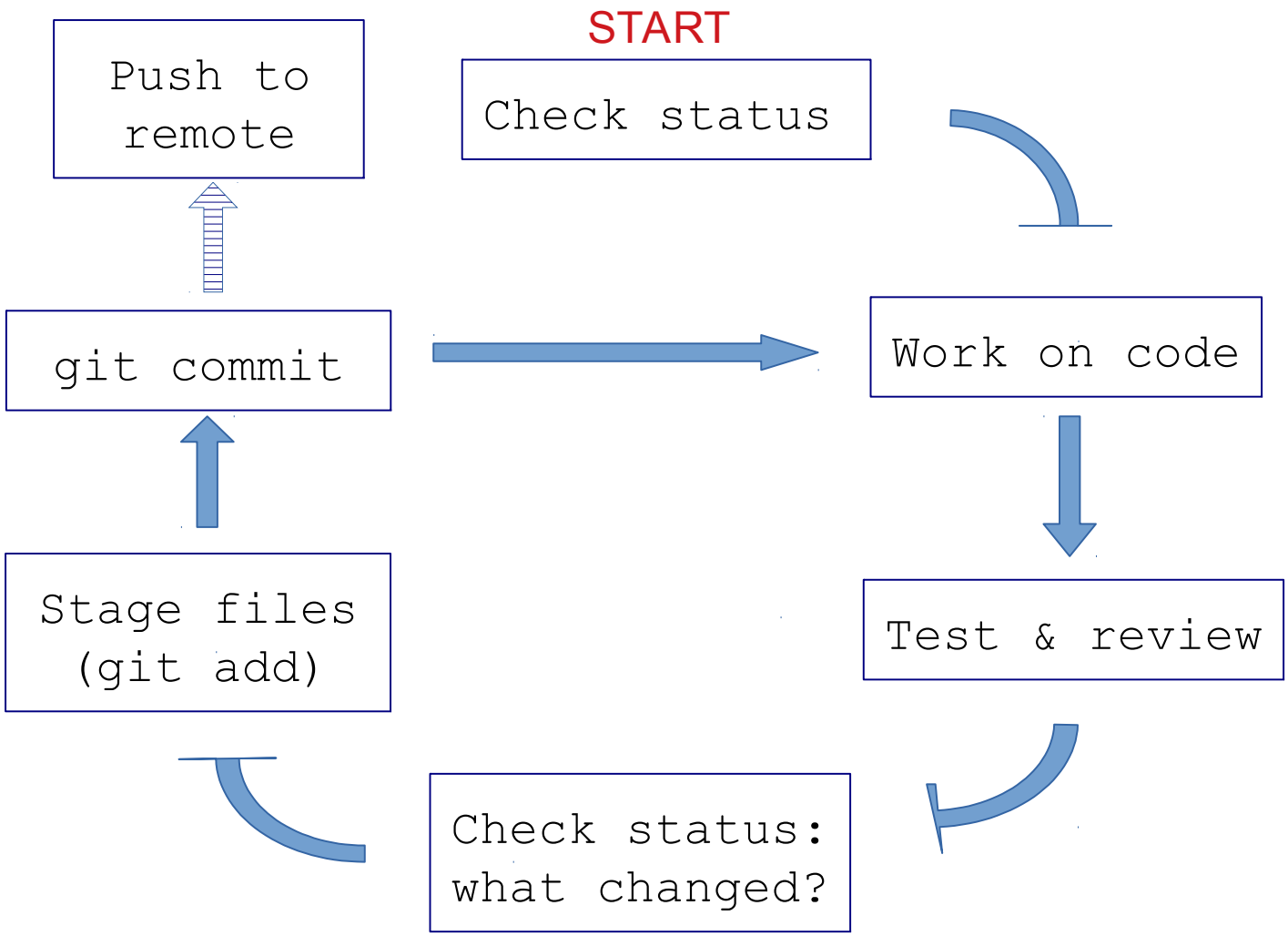
2. locate the project folder & select it

Simpler: Most IDE have a menu function to create a project from a remote git repository. They clone it and create project all in one.

Comparison of 2 Cases

(*done in class*)

Workflow for an *individual* project



Git Workflow for an *Individual* project

1) Check status of your working copy (*)

```
cmd> git status
```

It should be clean. If not, do "git diff" and then...

2) Commit changes or update your working copy.

(`git diff, git add -u, git commit`)

3) Do some work:

Code, test. Code, test. Review.

(*) *if you work on more than one computer, you need to "fetch" or "pull" any work from Github that is not on this computer (i.e. this local repo).*

Git Workflow (cont'd)

4) After code-test-reivew: check status again

```
cmd> git status
Changes not staged for commit:
    modified: src/Problem2.java
Untracked files:
    src/Problem3.java
```

5) Add and commit your work to the local repository

```
cmd> git add src/Problem2.java src/Problem3.java
cmd> git commit -m "Solved problems 2 and 3"
[master 29abae0] Solved problem 2 and 3
2 files changed, 44 insertions(+), 5 deletions
```

Git Workflow (update remote)

6) Push the changes to Github

```
cmd> git push
Compressing objects: 100% (12/12), done.
Writing objects: 100% (12/12), 3.60 KiB,
done.
Total 12 (delta 9), reused 0 (delta 0)
remote: Resolving deltas: 100% (9/9), ...
To https://github.com/fatailaijon/demo.git
 468abdf..29abae0  master -> master
```

7) Take a break.

That's it! Repeat the cycle as you work.

Github Workflow for Team Projects

On a **team project**, other people will commit files to the **same** Github repository!

You should update your local repository from Github before trying to "push" your work to Github.

Use "Github Flow" as workflow in team projects.

"Github Flow" is a separate topic. Its good for both team and solo projects.

Github Flow is the convention for team work in this course.