

Fastcampus Data Science SCHOOL

Linux && git

Introduce

최우영

- Solution Architect, Web Developer, Instructor
- Skills: Python, Golang, Julia, Node.js, Google tag manager ...

blog: <https://blog.ulgoon.com/>

github: <https://github.com/ulgoon/>

email: me@ulgoon.com

Goal

- Linux의 역사를 이해한다
- CLI에 대한 공포를 극복하고 Shell과 친구가 된다
- Linux Shell 커マン드를 학습하여 능숙하게 이를 활용할 수 있다
- Vim 텍스트 에디터를 통해 파일을 작성하고 매크로를 만들 수 있다

Goal

- git을 이해하고, git과 github이 다름을 인지한다
- git을 활용하여 나의 소스코드를 관리할 수 있다
- 데이터 사이언티스트의 커리어를 스웩할 나만의 멋진블로그를 만들 수 있다
- git의 branch model을 활용해 능숙하게 코드관리할 수 있다
- git으로 타인과 협업하며, 다른 프로젝트에 기여할 수 있다

Linux



Before Linux



- 1965년 데니스 리치, 켄 톰슨 외 x명이 AT&T Bell 연구소에서 PDP-7 기반 어셈블리어로 작성한 UNIX를 개발

Before Linux



- 1973년 데니스 리치와 켄 톰슨이 C를 개발한 뒤, C 기반 UNIX 재작성

Before Linux

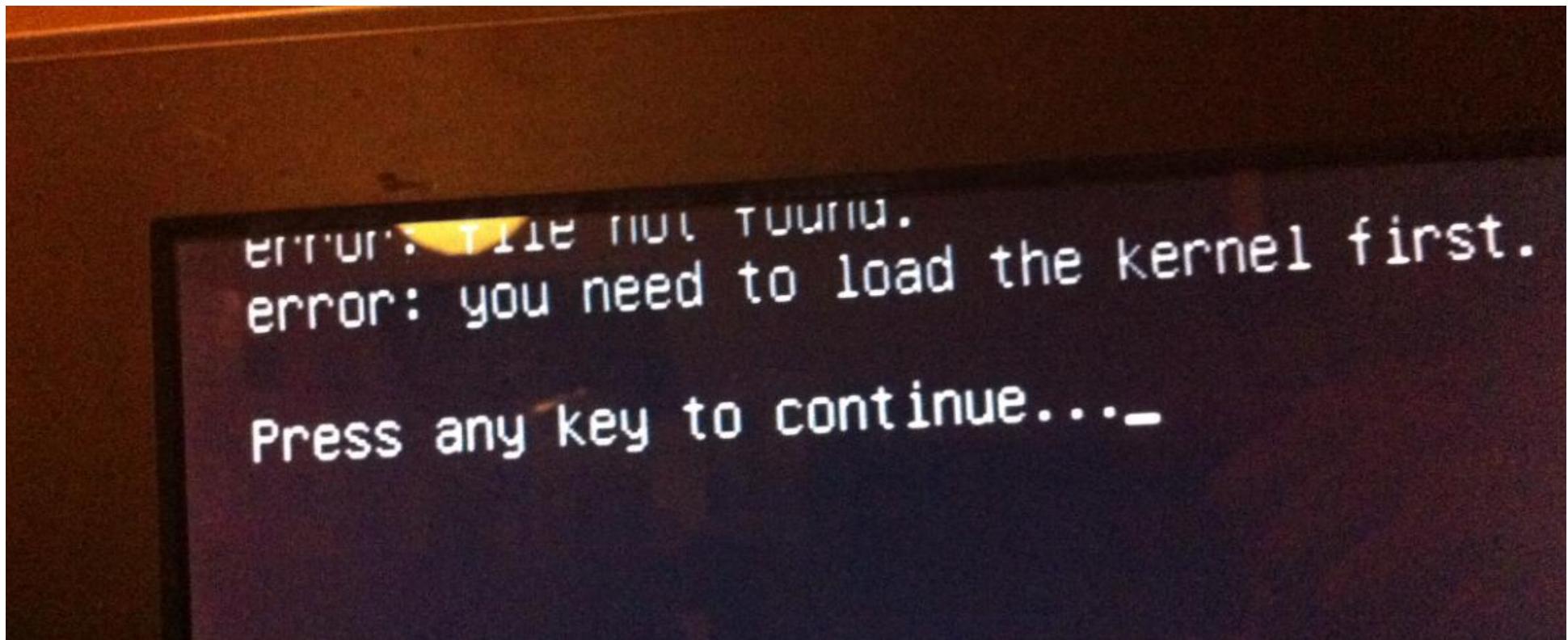


- 1984년 리차드 스톤먼이 오픈 소프트웨어 자유성 확보를 위한 GNU 프로젝트 돌입

Meaning of GNU

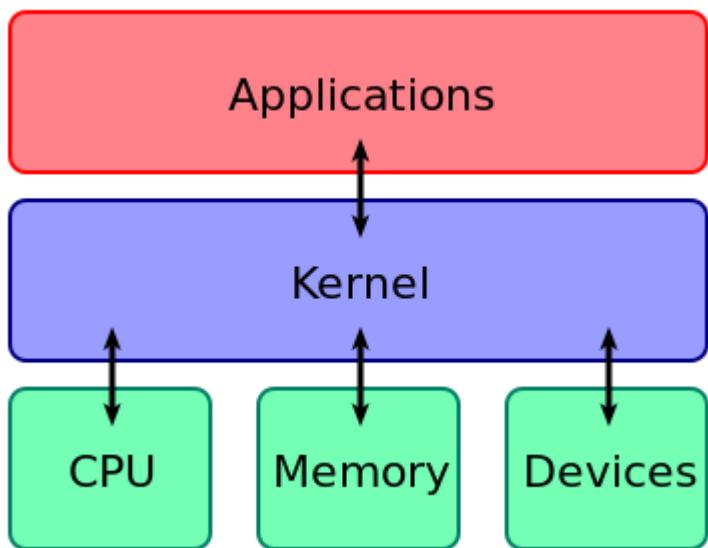
GNU == G NU is N ot U nix

Before Linux



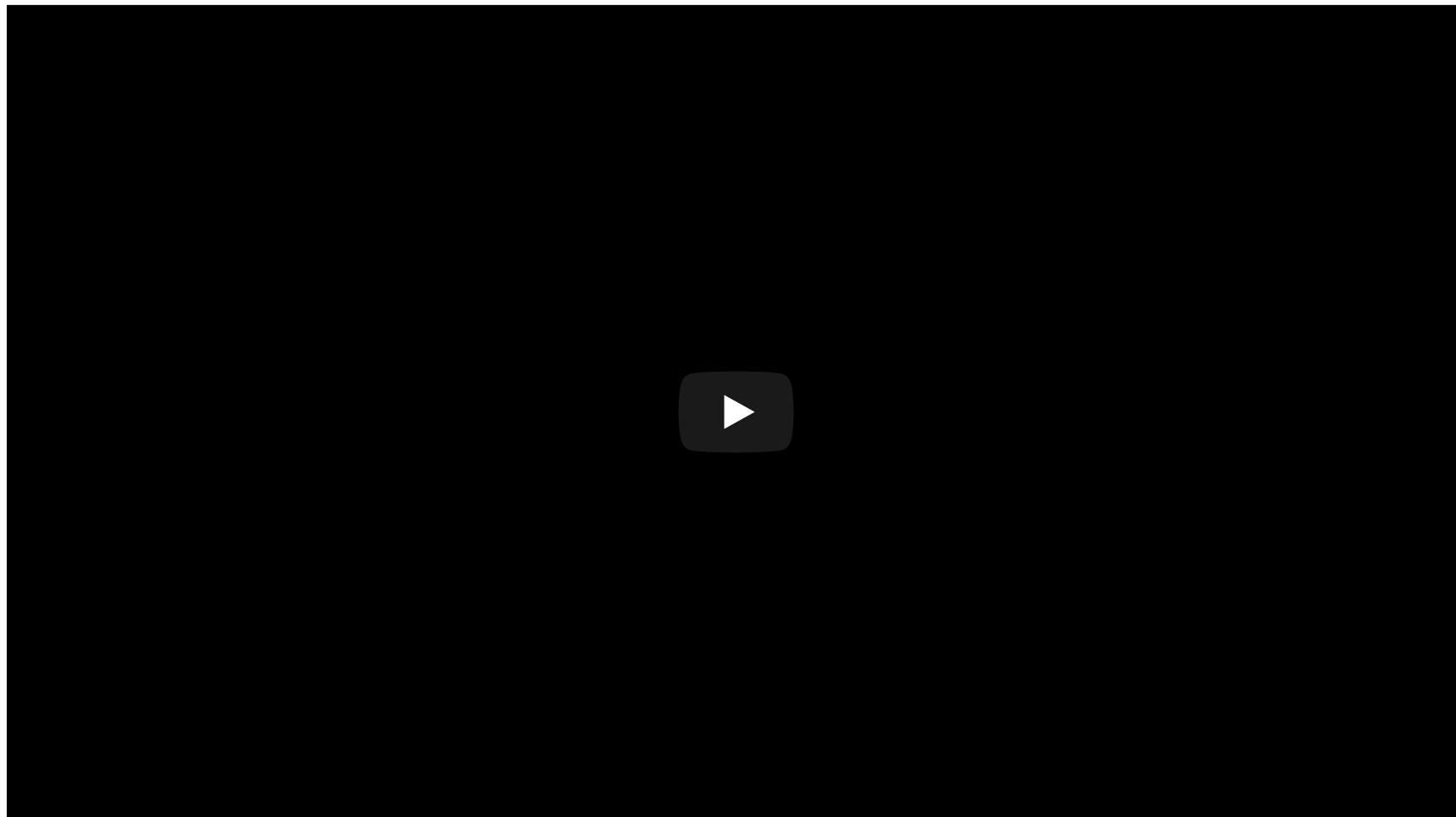
- But, GNU 프로젝트에는 커널이 없었고..

Kernel



- 하드웨어와 응용프로그램을 이어주는 운영체제의 핵심 시스템소프트웨어

Linus Torvalds



- 헬싱키 대학생이던 리누스 토발즈는 앤디 타넨바움의 MINIX를 개조한 Linux를 발표
- 0.1 - bash(GNU Bourne Again SHell), gcc(UNIX 기반 C 컴파일러)

Linux

- 리누스 토발즈가 작성한 커널 혹은 GNU 프로젝트의 라이브러리와 도구가 포함된 운영체제
- PC와 모바일, 서버, 임베디드 시스템 등 다양한 분야에서 활용
- Redhat, Debian, Ubuntu, Android 등 다양한 배포판이 존재

Shell

- 운영체제의 커널과 사용자를 이어주는 소프트웨어
- sh(Bourne Shell): AT&T Bell 연구소의 Steve Bourne이 작성한 유닉스 쉘
- csh: 버클리의 Bill Joy가 작성한 유닉스 쉘(C언어랑 비슷한 모양)
- bash(Bourne Again Shell): Brian Fox가 작성한 유닉스 쉘
 - 다양한 운영체제에서 기본 쉘로 채택
- zsh: Paul Falstad가 작성한 유닉스 쉘
 - sh 확장형 쉘
 - 현재까지 가장 완벽한 쉘

Let's learn bash

Shell Command Basic

```
$ cd documents  
  
$ mkdir python - make directory python  
$ cd python - change directory  
$ cd .. - up to  
  
$ ls  
$ ls -al  
  
$ touch hello.py - create hello.py  
$ exit - terminate shell
```

chmod

| 파일의 권한을 설정할 때 사용

drwxr-xr-x

d or - : directory or file
(user)(group)(other)

r : read

w : write

x : execute

- : no permission

chmod

```
$ chmod [옵션] (8진수) (파일명)
```

8진수

0: 000

1: 001

2: 010

3: 011

4: 100

5: 101

6: 110

7: 111

Shell Command Basic

```
$ mv hello.py python  
$ cp hello.py python
```

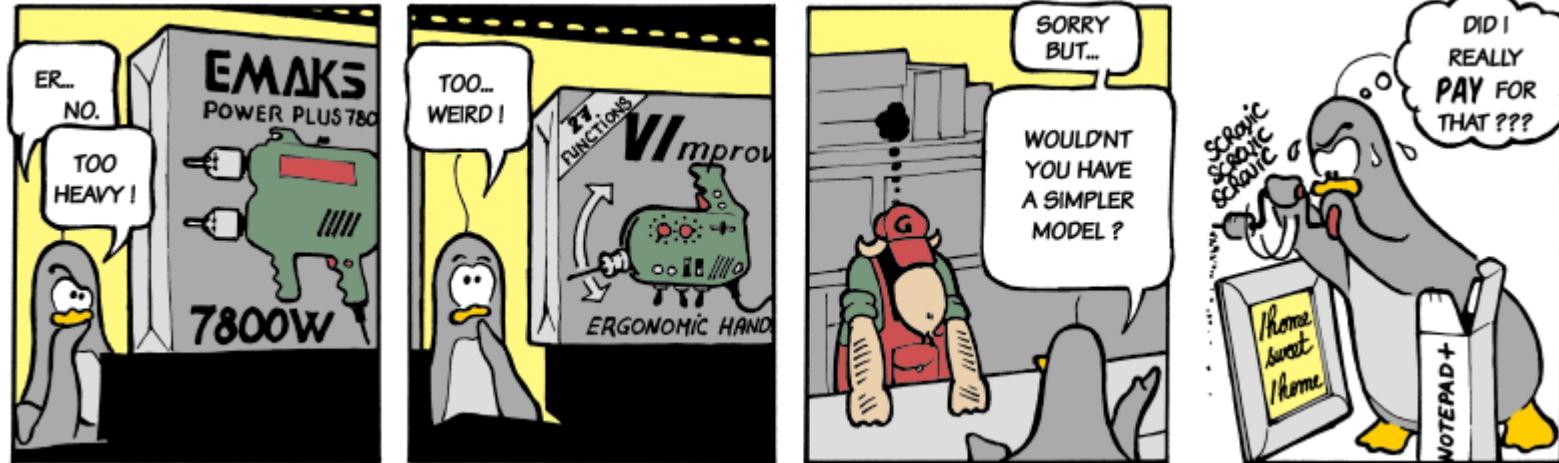
```
$ rm hello.py  
$ rm -rf python/
```

```
$ python --version  
$ python --help
```

Vim



Vim



Copyright (c) 2007 Laurent Gregoire

- Vi improved Text Editor

Vim Basic

Command

```
h,j,k,l – move cursor  
i – insert mode  
v – visual mode  
d – delete  
y – yank  
p – paste  
u – undo  
r – replace  
$ – move end of line  
^ – move start of line  
  
:q – quit  
:q! – quit w/o write(no warning)  
:wq – write and quit  
  
:{number} – move to {number}th line
```

write `hello.py` with Vim

```
$ vim
```

```
$ vim hello.py
```

```
i
```

```
-- insert --
```

```
type print("hello python!")
```

```
press esc to escape
```

```
:wq
```

```
$ python hello.py
```

copy & paste

```
$ vim hello.py
```

```
v
```

```
-- visual --
```

블록지정 후 y

```
p
```

press esc to escape

```
:wq
```

```
$ python hello.py
```

Use macro with Vim

```
$ vim hello.py
```

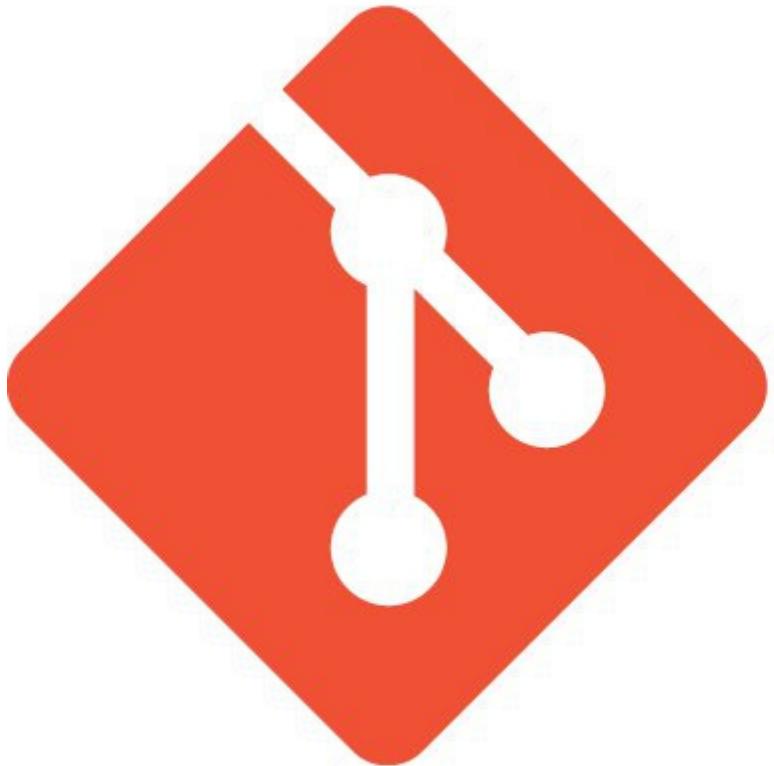
qa - a라는 매크로를 생성

--recording-- 이 보이면 매크로 작성

q - 매크로 작성 종료

@a - a 매크로 실행

10@a - a 매크로 10회 실행



git

VCS (Version Control System)

== SCM (Source Code Management)

< SCM (Software Configuration Management: 형상관리)

chronicle of git



chronicle of git

- Linux Kernel을 만들기 위해 Subversion을 쓰다 화가 난 리누스 토발즈는 2주만에 git이라는 버전관리 시스템을 만듦
[git official repo](#)

Characteristics of git

- 빠른속도, 단순한 구조
- 분산형 저장소 지원
- 비선형적 개발(수천개의 브랜치) 가능

데이터 사이언티스트가 git을 잘 써야 하는 이유?

Pros of git

- 중간-발표자료_최종_진짜최종_15-4(교수님이 맘에들어함)_언제까지??_이걸로갑시다.ppt
- 소스코드 주고받기 없이 동시작업이 가능해져 생산성이 증가
- 수정내용은 **commit** 단위로 관리, 배포 뿐 아니라 원하는 시점으로 **Checkout** 가능
- 새로운 기능 추가는 **Branch**로 개발하여 편안한 실험이 가능하며, 성공적으로 개발이 완료되면 **Merge**하여 반영
- 인터넷이 연결되지 않아도 개발할 수 있음

Open-source project

<https://github.com/python/cpython>

<https://github.com/tensorflow/tensorflow>

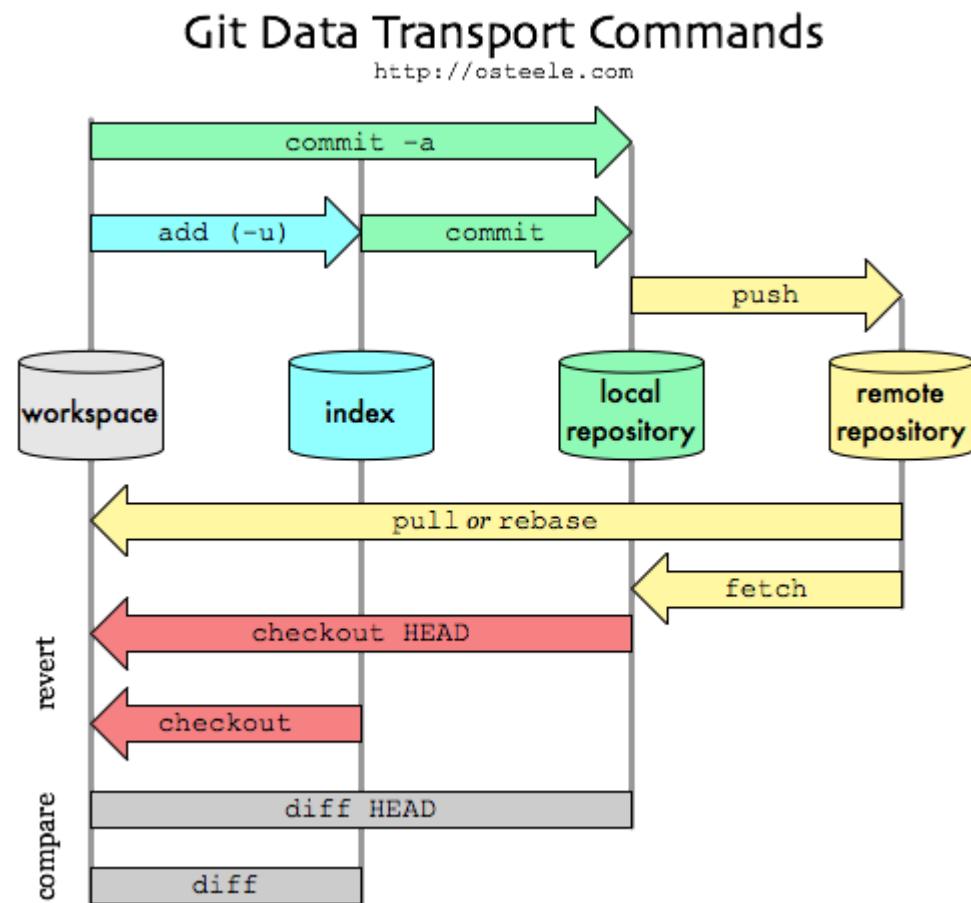
<https://github.com/JuliaLang/julia>

<https://github.com/golang/go>

git inside

- Blob: 모든 파일이 Blob이라는 단위로 구성
- Tree: Blob(tree)들을 모은 것
- Commit: 파일에 대한 정보들을 모은 것

git Process and Command



Useful manager for mac

http://brew.sh/index_ko.html

install git

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

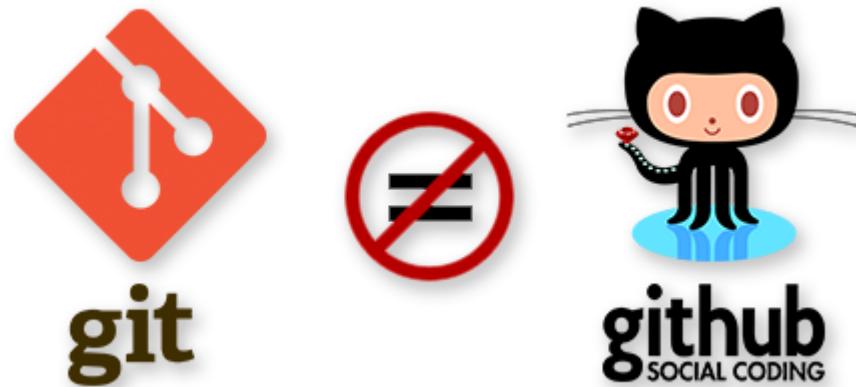
```
// MacOS  
$ brew install git  
// Linux  
$ sudo apt-get install git
```

- Windows: install [git bash](#)

```
$ git --version
```

 으로 정상적으로 설치되었는지를 확인

git is not equal to github



sign up github

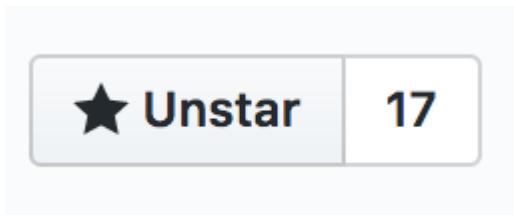
<https://github.com/>

important!!

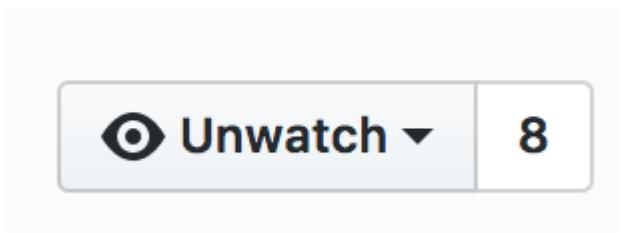
- 가입할 `email` 과 `username` 은 멋지게
- private repo를 원한다면 \$7/month

Important github User Interface

Star



watch



Set configuration

terminal

```
$ git config --global user.name "username"  
$ git config --global user.email "github email address"  
$ git config --global core.editor "vim"  
$ git config --list
```

My First Repo

Let's make your first repo with github

My First Repo

```
$ git init  
$ git add .  
$ git commit -m "some commit"
```

After create new repo through github,

```
$ git remote add origin https://github.com/username/repo.git  
$ git push origin master
```

My First Github Pages

github 저장소를 활용해 정적인 사이트 호스팅이 가능

username .github.io

<http://tech.kakao.com/>

<https://spoqa.github.io/>

sample index page

After create new repo through github,

```
$ git clone https://github.com/username/username.github.io.git
```

Create New file `index.html`

```
$ git add .
```

```
$ git commit -m "first page"
```

```
$ git push origin master
```

sample index page

```
<!doctype html>
<html>
  <head>
    <meta charset="utf-8">
    <title>My first gh page</title>
  </head>
  <body>
    <h1>Home</h1>
    <p>Hello, there!</p>
  </body>
</html>
```

Static Site Generator

- [Jekyll](#): Ruby 기반 정적인 블로그 생성기
 - 설치와 사용이 쉬움
 - 사용자가 많았음
- [Hugo](#): Golang 기반 정적인 블로그 생성기
 - 빠른 속도로 사이트를 생성
 - 사용자 증가 중
- [Hexo](#): Node.js 기반 정적인 블로그 생성기
 - Node.js를 안다면 커스터마이즈가 쉬움
 - 빠른 속도로 사용자 증가 중

Recommand

Jekyll > Hugo > Hexo

Let's use Hexo

Requirements

1. git
2. node.js(<https://nodejs.org/en/>)

```
$ npm install -g hexo-cli
```

Init hexo project

```
$ hexo init <folder>
$ cd <folder>
$ npm install
```

clean && generate static files

```
$ hexo clean && hexo generate
```

Run hexo server

```
$ hexo server
```

deploy

```
$ npm install hexo-deployer-git --save
```

```
deploy:  
  type: git  
  repo: <repository url>  branch: [branch] #published  
  message:
```

What is branch?

What is branch?



MARVEL
**GUARDIANS
OF THE GALAXY**

fastcampus 데이터 사이언스 스쿨, Wooyoung Choi, 2018

S SIDESHOW

What is branch?

분기점을 생성하고 독립적으로 코드를 변경할 수 있도록 도와주는 모델

ex)

master branch

```
print('hello world!')
```

another branch

```
for i in range(1,10):
    print('hello world for the %s times!' % i)
```

Branch

Show available local branch

```
$ git branch
```

Show available remote branch

```
$ git branch -r
```

Show available All branch

```
$ git branch -a
```

Branch

Create branch

```
$ git branch stem
```

Checkout branch

```
$ git checkout stem
```

Create & Checkout branch

```
$ git checkout -b new-stem
```

make changes inside [readme.md](#)

```
$ git commit -a -m 'edit readme.md'
```

```
$ git checkout master
```

merge branch

```
$ git merge stem
```

Branch

delete branch

```
$ git branch -D stem
```

push with specified remote branch

```
$ git push origin stem
```

see the difference between two branches

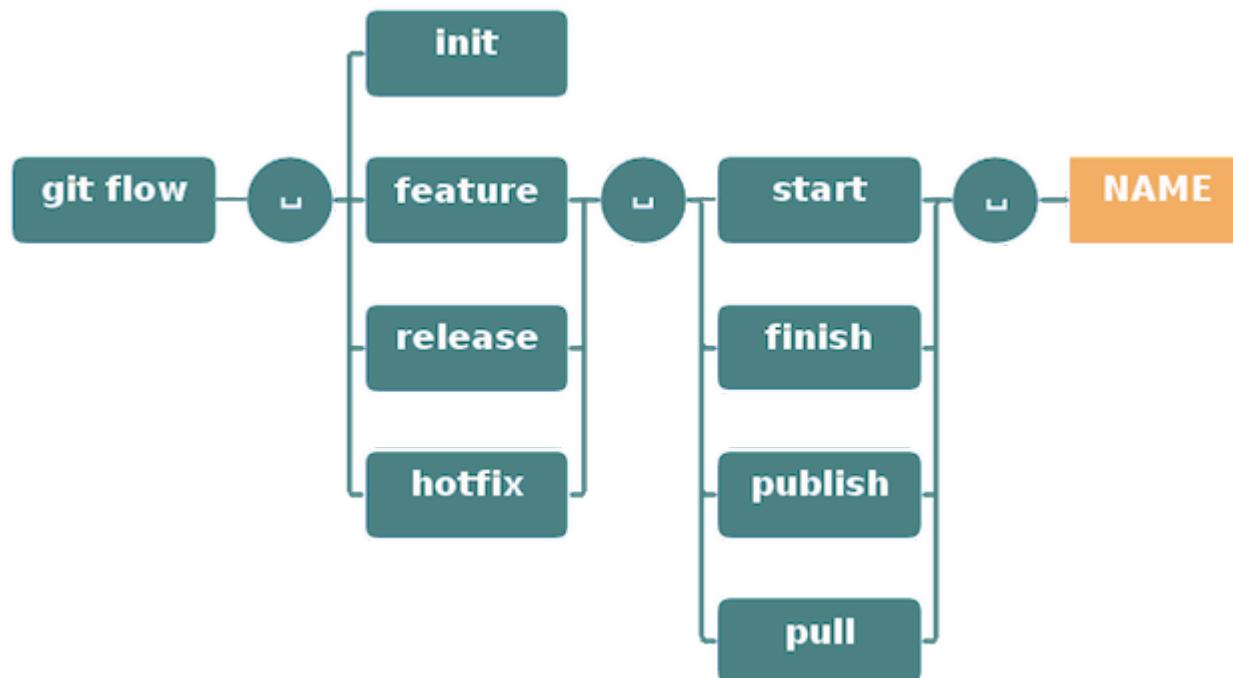
```
$ git diff master stem
```

git flow strategy



use git flow easily!

Link



Collaborate with your Co-worker

Method 1: Collaboration

Add Collaborator

The screenshot shows the GitHub repository settings interface. At the top, there is a navigation bar with links for Code, Issues (0), Pull requests (0), Projects (0), Wiki, Settings (which is highlighted with an orange border), and Insights. On the left, a sidebar menu lists Options, Collaborators (which is also highlighted with an orange border), Webhooks, Integrations & services, and Deploy keys. The main content area is titled 'Collaborators' and contains the message: 'This repository doesn't have any collaborators yet. Use the form below to add a collaborator.' Below this, there is a search bar with the placeholder 'Search by username, full name or email address' and a note: 'You'll only be able to find a GitHub user by their email address if they've chosen to list it publicly. Otherwise, use their username instead.' At the bottom right of the search bar is a button labeled 'Add collaborator'.

Collaboration

Add, Commit and Push like you own it.

Method 2: Fork and Merge

 Watch ▾ 1

 Unstar 1

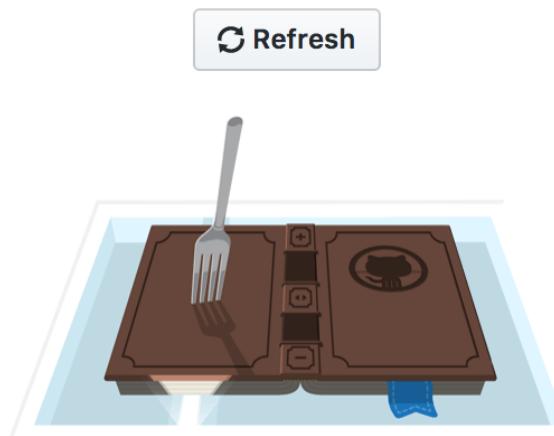
 Fork 0

CS ▾

Fork and Merge

Forking JKeun/study-of-regression-toyota-corolla

It should only take a few seconds.



Fork and Merge

 ulgoon / **study-of-regression-toyota-corolla**
forked from [JKeun/study-of-regression-toyota-corolla](#)

 Code  Pull requests 0  Projects 0  Wiki 

 Study - Regression Analysis using ToyotaCorolla dataset
[Add topics](#)

 9 commits  1 branch

[Branch: master ▾](#) [New pull request](#)

Fork and Merge

```
$ git clone https://github.com/username/forked-repo.git
```

Fork and Merge

```
$ git branch -a  
$ git checkout -b new-feature
```

Fork and Merge

Make some change

```
$ git add file  
$ git commit -m "commit message"  
$ git push origin new-feature
```

Fork and Merge

No description, website, or topics provided.

Edit

Add topics

1 commit

3 branches

0 releases

1 contributor

Your recently pushed branches:

edit-index (less than a minute ago)

Compare & pull request

Fork and Merge

Open a pull request

Create a new pull request by comparing changes across two branches. If you need to, you can also [compare across forks](#).

The screenshot shows the GitHub interface for creating a pull request. At the top, there are dropdown menus for 'base fork' (set to 'kingwangzzang1234/kingwa...'), 'base' (set to 'master'), 'head fork' (set to 'ulgoon/kingwangzzang1234...'), and 'compare' (set to 'edit-index'). A green checkmark indicates that the branches are 'Able to merge'. Below this, a preview window titled 'edit index.html' shows the content 'add header, footer tag'. The interface includes 'Write' and 'Preview' tabs, and a toolbar with icons for bold, italic, code blocks, and other rich text features. A note at the bottom of the preview area says 'Attach files by dragging & dropping, [selecting them](#), or pasting from the clipboard.' At the bottom left, there is a checkbox for 'Allow edits from maintainers' with a link to learn more. On the right, a large green button says 'Create pull request'.

Fork and Merge

edit index.html #2

 Open ulgoon wants to merge 1 commit into `kingwangzzang1234:master` from `ulgoon:edit-index`

Conversation 0 Commits 1 Files changed 1

 ulgoon commented 17 seconds ago

Contributor + 

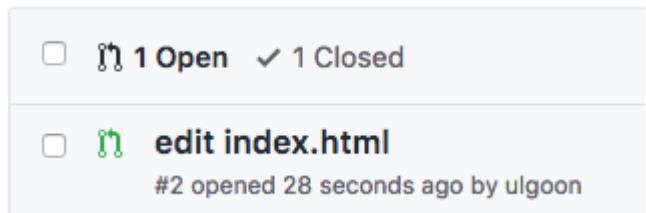
add header, footer tag

 edit index.html ... d81b362

Add more commits by pushing to the **edit-index** branch on [ulgoon/kingwangzzang1234.github.io](#).

  This branch has no conflicts with the base branch
Only those with [write access](#) to this repository can merge pull requests.

Fork and Merge



Fork and Merge

edit index.html #2

Open ulgoon wants to merge 1 commit into `kingwangzzang1234:master` from `ulgoon:edit-index`

Conversation 0 Commits 1 Files changed 1

 ulgoon commented 38 seconds ago

Contributor + 

add header, footer tag

 edit index.html ... d81b362

Add more commits by pushing to the `edit-index` branch on [ulgoon/kingwangzzang1234.github.io](#).

 This branch has no conflicts with the base branch
Merging can be performed automatically.

Merge pull request ▾ You can also [open this in GitHub Desktop](#) or view [command line instructions](#).

Fork and Merge

edit index.html #2

[Open](#) ulgoon wants to merge 1 commit into `kingwangzzang1234:master` from `ulgoon:edit-index`

Conversation 0 Commits 1 Files changed 1

ulgoon commented 38 seconds ago

add header, footer tag

Contributor +

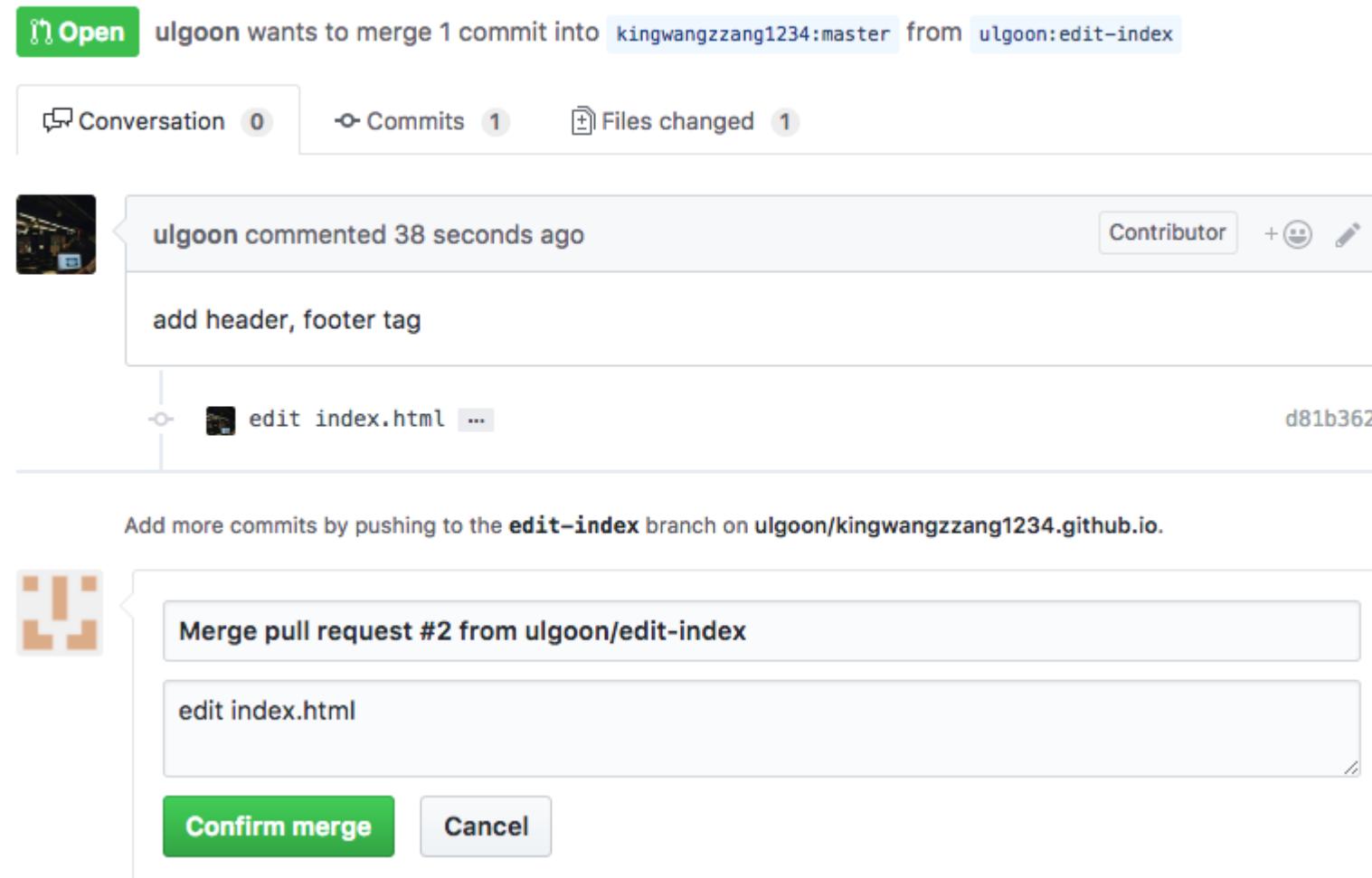
edit index.html ... d81b362

Add more commits by pushing to the `edit-index` branch on `ulgoon/kingwangzzang1234.github.io`.

Merge pull request #2 from `ulgoon/edit-index`

edit index.html

Confirm merge Cancel



Fork and Merge

edit index.html #2

Merged kingwangzzang... merged 1 commit into kingwangzzang1234:master from ulgoon:edit-index just now

Conversation 0 Commits 1 Files changed 1

ulgoon commented 38 seconds ago
add header, footer tag

Contributor +

edit index.html ... d81b362

kingwangzzang1234 merged commit 45d71fa into kingwangzzang1234:master just now

Revert

This screenshot shows a GitHub pull request merge commit. At the top, a purple banner indicates the merge was just now. Below it, there are tabs for Conversation (0), Commits (1), and Files changed (1). A comment from user 'ulgoon' is shown, suggesting to add header and footer tags. Below the comment is a commit from 'edit index.html' with hash 'd81b362'. At the bottom is a merge commit from 'kingwangzzang1234' that merged commit '45d71fa' into 'kingwangzzang1234:master' just now. There is also a 'Revert' button next to the merge commit.

continuous pull

continuous pull

```
$ git remote add upstream  
https://github.com/anotheruser/original-repo.git
```

```
$ git fetch upstream  
$ git merge upstream/master
```