

Fastcampus

Web Programming & Frontend Dev SCHOOL

Intro to Computer Science

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/>

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수업을 본격적으로 시작하기 전

Goal

- 컴퓨터를 이해하고, 메모리 구조체계에 대해 이해할 수 있다.
- 버전관리의 중요성을 절감하고, git을 활용해 버전관리를 할 수 있다.
- github으로 git을 관리하고, 나만의 블로그를 생성할 수 있다.

understanding of computer systems

What is Computer?

What is Computer?

Compute + er

Computation vs Calculation

"calculation" implies a strictly arithmetic process,
whereas "computation" might involve applying rules in a systematic way

Computer vs Calculator

- Stored Program computer -> Computer
 - Stores and Executes instructions
- Fixed Program computer -> Calculator
 - just calculate

엇? 그럼 공학용 계산기는???

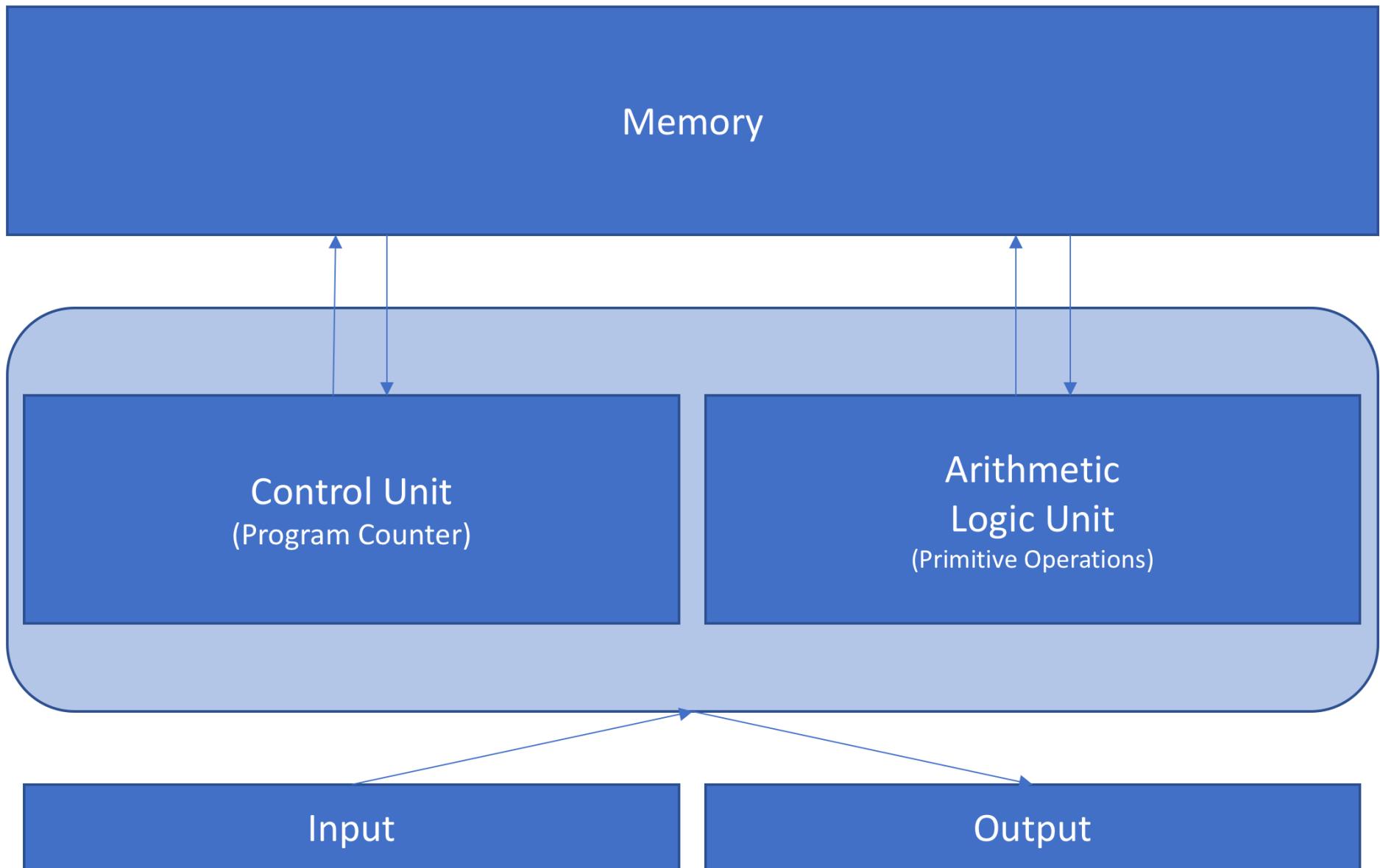
Computer Science and Engineering

- 컴퓨터의 소프트웨어를 다루는 학문
- 컴퓨터라는 물리적 기기를 연구하는 것이 아닌 Computer의 개념과 구조를 이해하고 구현하는 학문

Computer



Basic Computer Architecture



Basic Computer Architecture

- Program Counter - contains the address (location) of the instruction being executed at the current time
- ALU(Arithmetic Logic) - +, -, *, /, AND, OR, NOT,

CPU and MicroProcessor



Architecture Naming

- x86

8080 - 8bit

8086 - 16bit

8088 - 8bit

80286 - 16bit

80386 - 32bit

..

Architecture Naming

- IA64

Itanium - IA64 based 64bit, 1999

...

- AMD64

Opteron - x86-64 based 64bit, 2003

Athlon

AMD Phenom

AMD FX

Ryzen

..

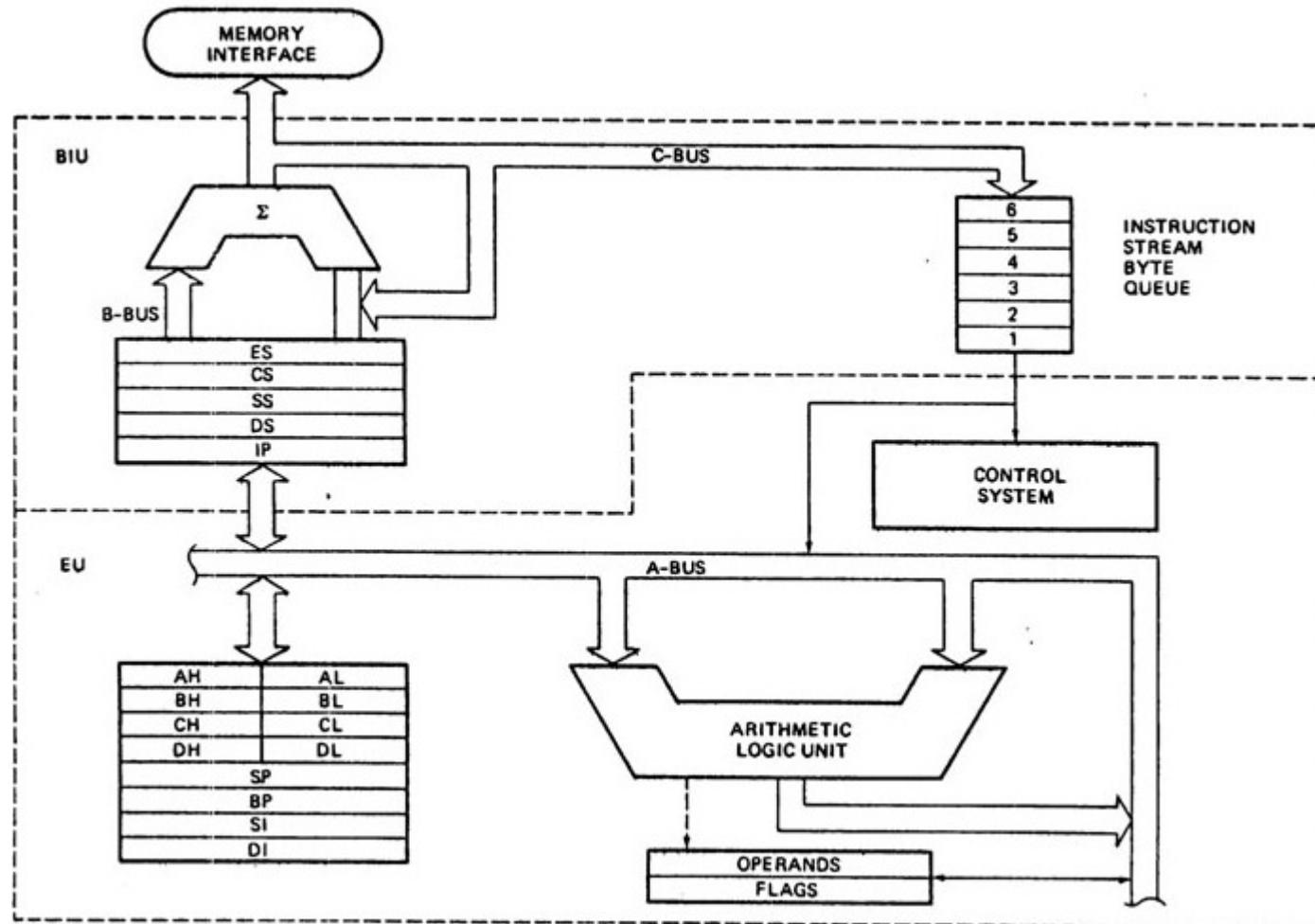
- ~~Intel64~~ == AMD64

Xeon - x86-64 based 64bit, 2004

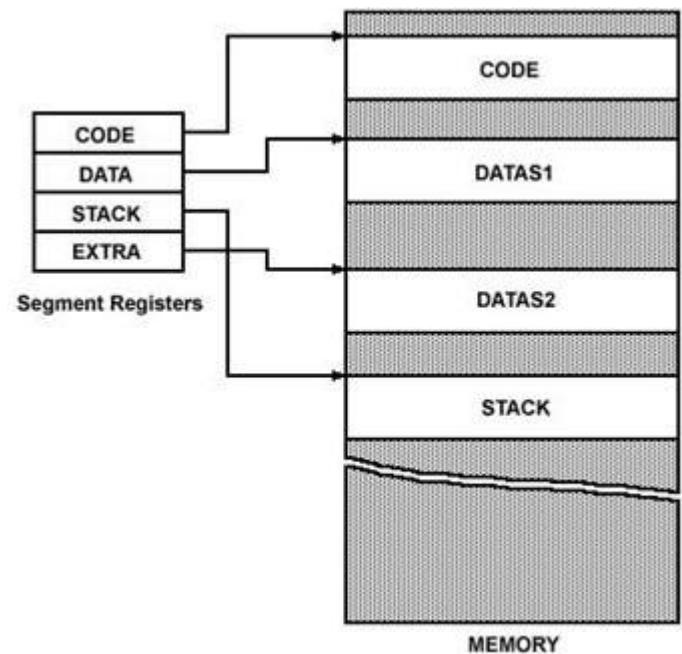
Core 2

Core i Series

Block Diagram of 8086



Memory Segments of 8086



CISC&RISC Architecture

- Complex Instruction Set Computers
 - 복잡한 명령구조
 - 어드레싱에 강점
 - 전력 신경쓸 필요없이 고성능 컴퓨팅에 사용
 - Intel x86, AMD64, ..
- Reduced Instruction Set Computers
 - 명령어의 단순화
 - 메모리 접근 횟수가 적음
 - 저전력 프로세싱에 사용
 - SPARC, ARM, ..

Memory

MEMORY



Memory

- 컴퓨터에서 사용할 수 있도록 정보를 저장하는 공간

- Random Access Memory
 - 자유롭게 읽고 쓸 수 있는 주기억장치
 - 메모리의 주소로 그 위치에 접근
 - RAM의 어떤 위치로든 같은 시간에 접근(Random Access)
 - 컴퓨터가 느려지면 재부팅을 하세요!

- Read Only Memory
 - 전원이 공급되지 않아도 그 정보를 유지하는 주기억장치
 - 비싸거나 느려서 안정적인 정보를 저장해야 할 때 사용
 - BIOS, OS, Firmware 정보 저장에 쓰임

OS

- Operating System: 운영체제
- 시스템 하드웨어와 응용 소프트웨어(한글, excel, ...)의 리소스를 관리하는 시스템
소프트웨어

Type

- Single-tasking / Multi-tasking
 - 한번에 1개 / n개 의 프로그램을 동시 수행(achieved by time-sharing)
- Single-user / Multi-user
- Distributed

Hardware <--> Operating System <--> Application Software <--> User

Chronicles of OS

Unix

- Starting in the 1970s by AT&T
- Ken Thompson, Denis Ritchie, ..

Unix-like

- Solaris
- BSD
- MacOS

Linux

- Unix-clone OS
- GNU/Linux
- Sep 17 1991 by Linus Torvalds

GNU is not Unix

- Ubuntu
- Fedora
- CentOS
- Debian
- Linux Mint
- ..

Linux-like

- Android
- Tizen
- Chrome OS
- ..

Windows

- CP/M-DOS -> MS-DOS
- Windows 1
- ..
- Windows 10
- Windows 95
- Windows 98
- Windows 2000

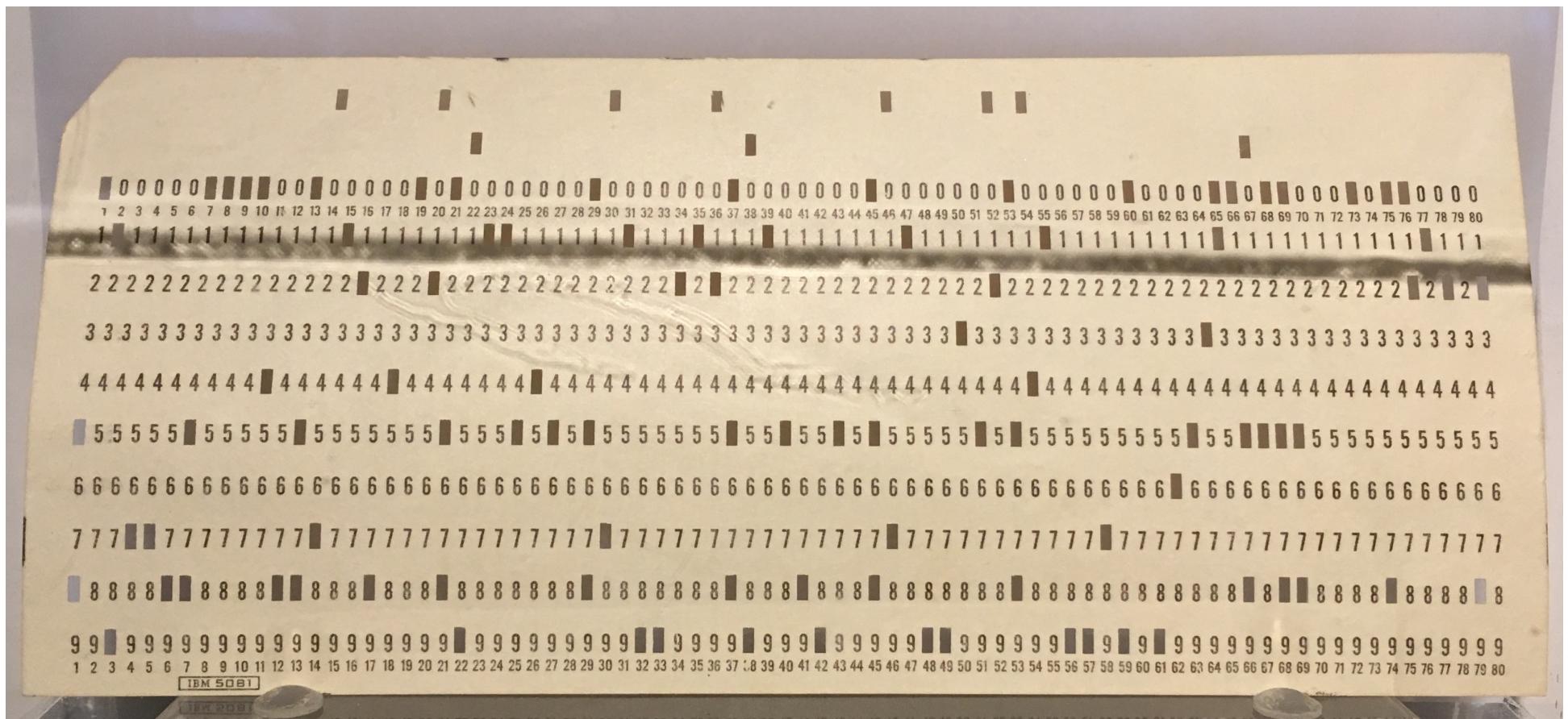
Windwos 9x vs Windows NT

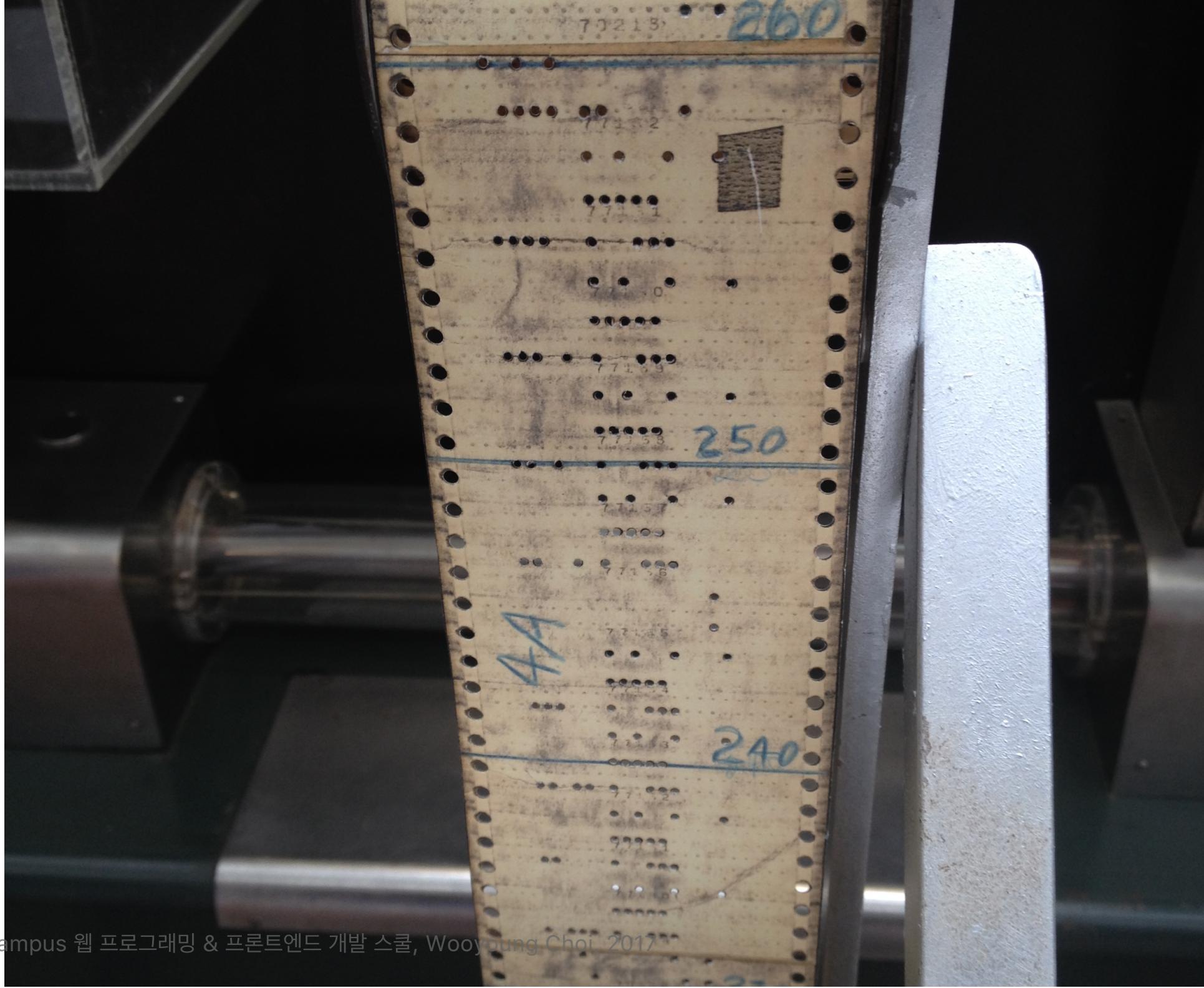
MS-DOS based -> 16bit

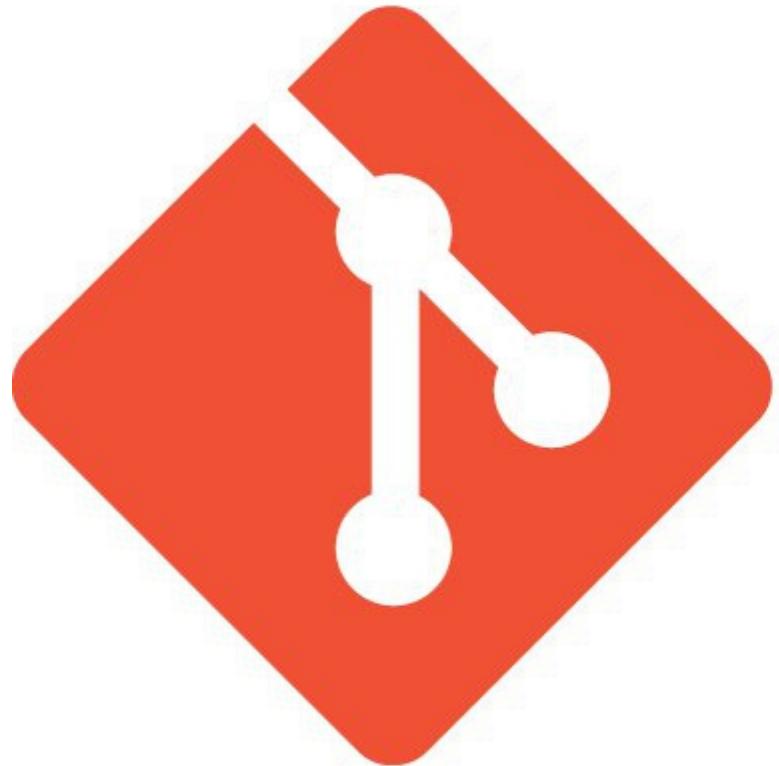
WindwosNT Kernel(3.1) based -> 32bit

WindwosNT Kernel(6.1) based -> x86-64(AMD64)

Patch & Debug







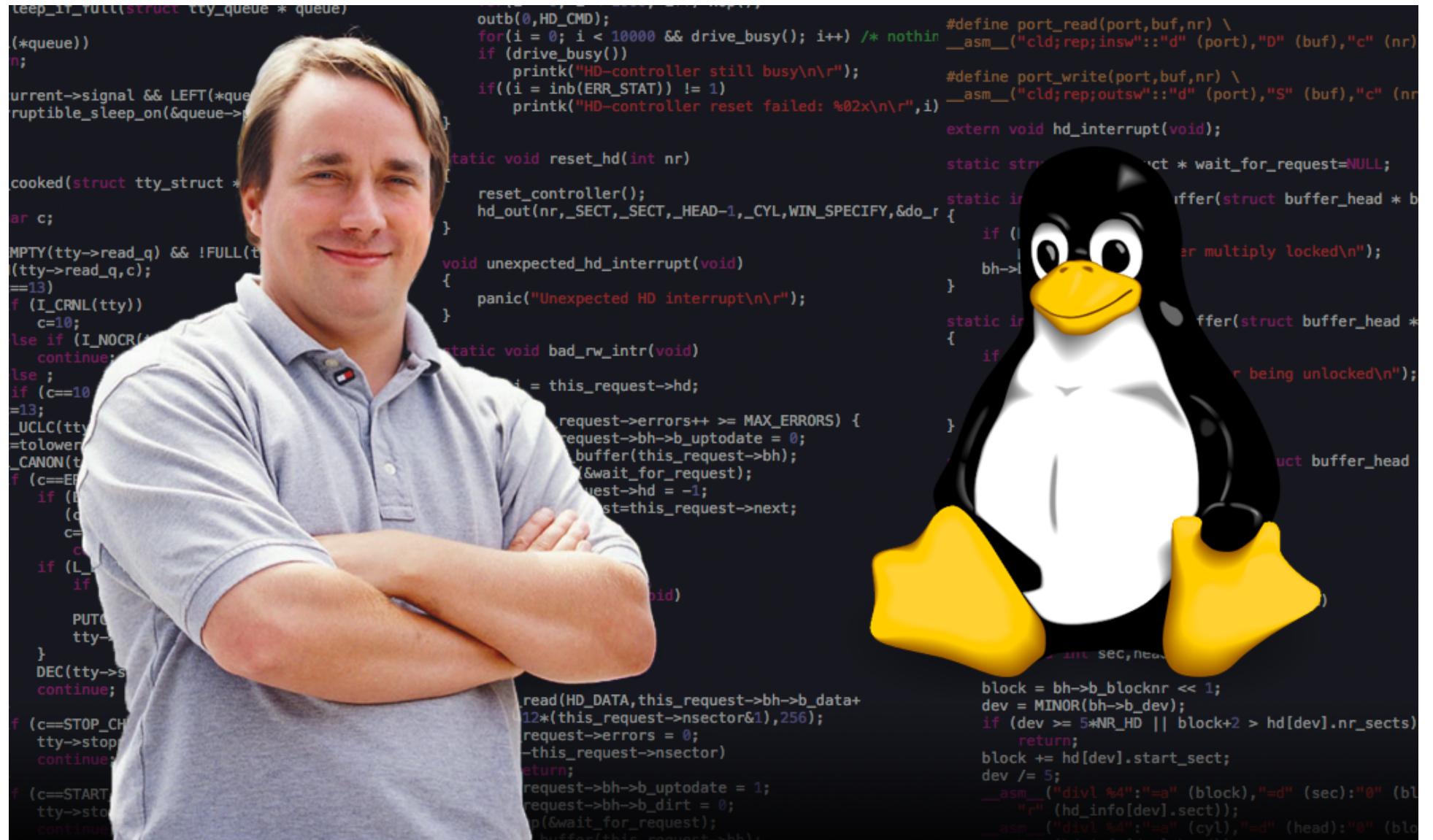
git

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

Pros of git

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

Open-source project

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

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

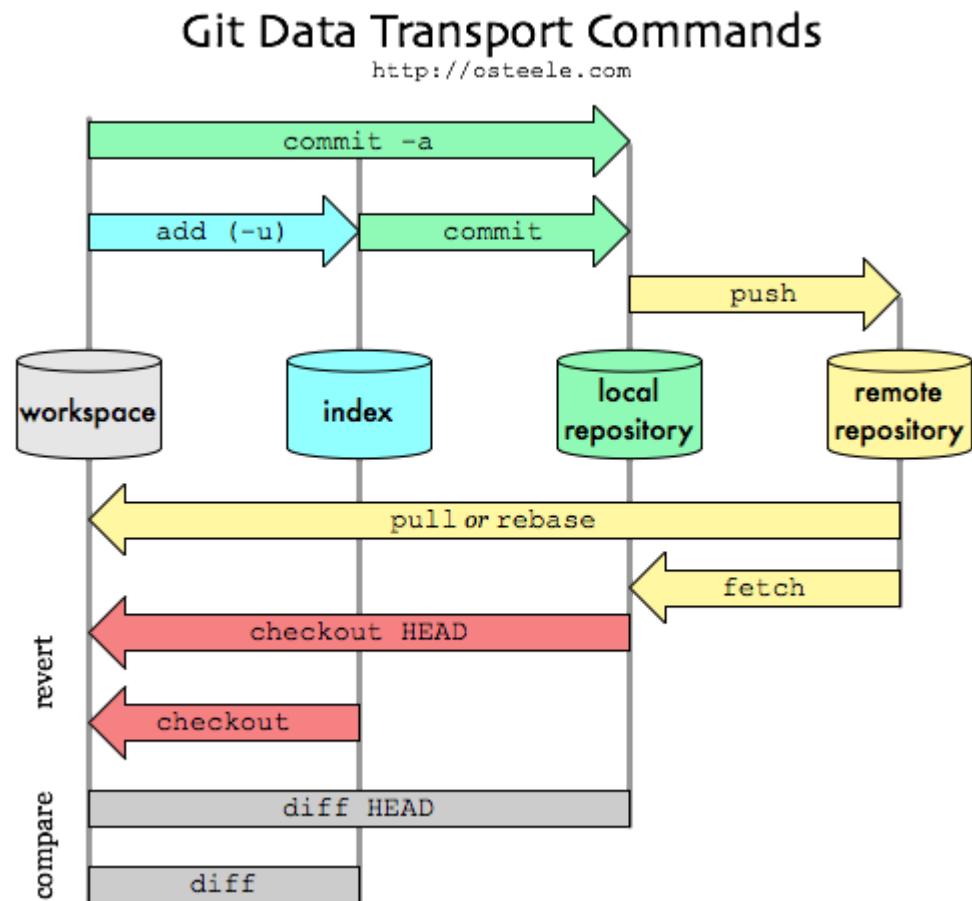
<https://github.com/JuliaLang/julia>

<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

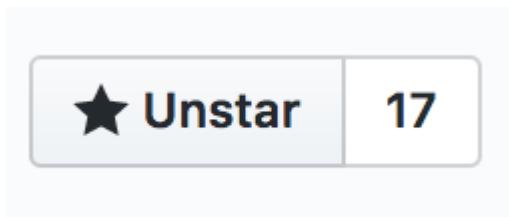
<https://github.com/>

important!!

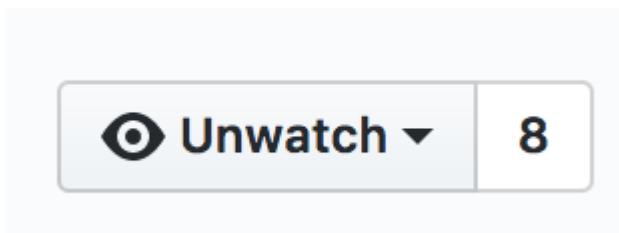
- 가입할 email 과 username 은 멋지게
- private repo를 원한다면 \$7/month

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 --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
```

github pages

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

What is branch?

What is branch?



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
```

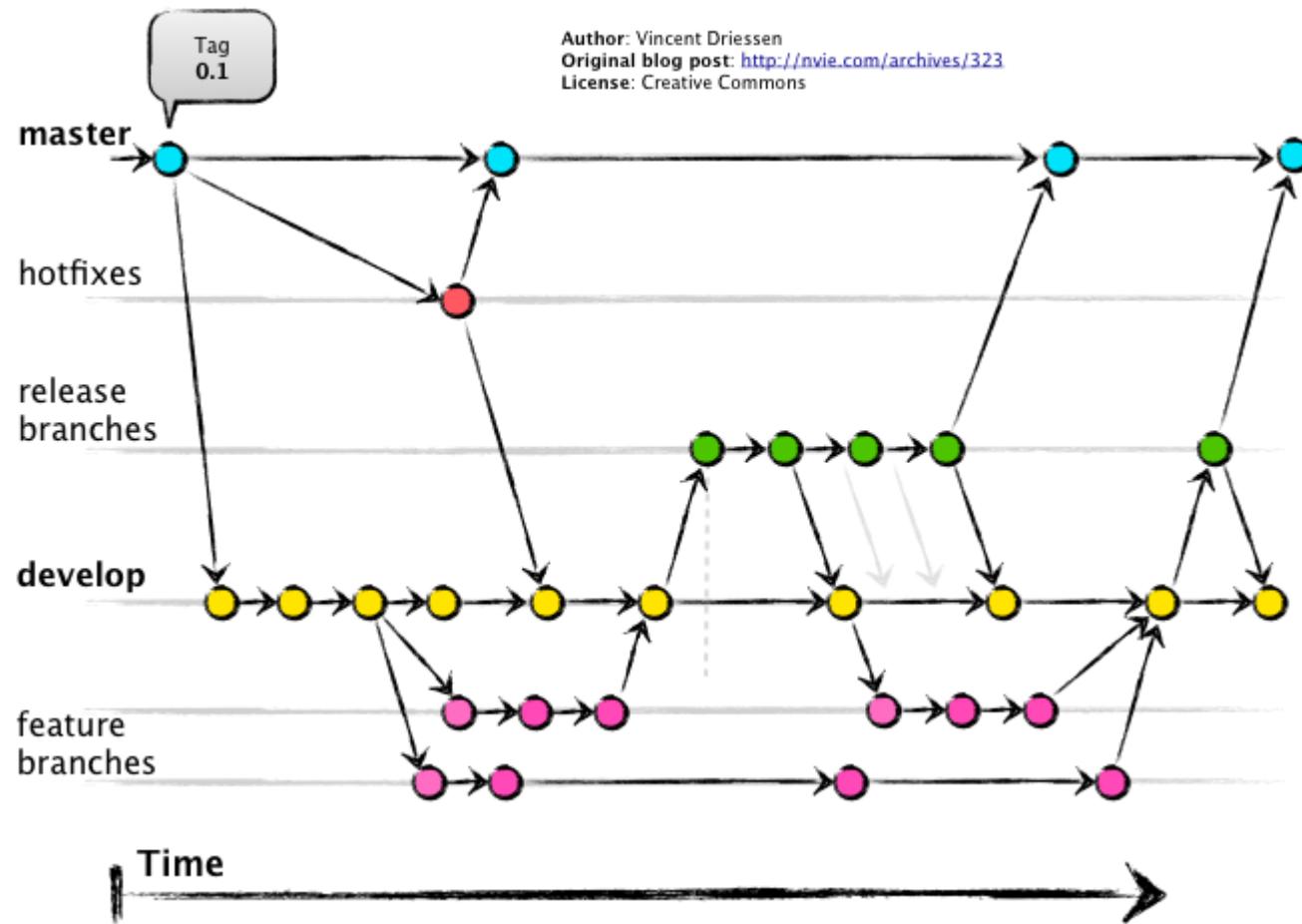
push with specified remote branch

```
$ git push origin stem
```

see the difference between two branches

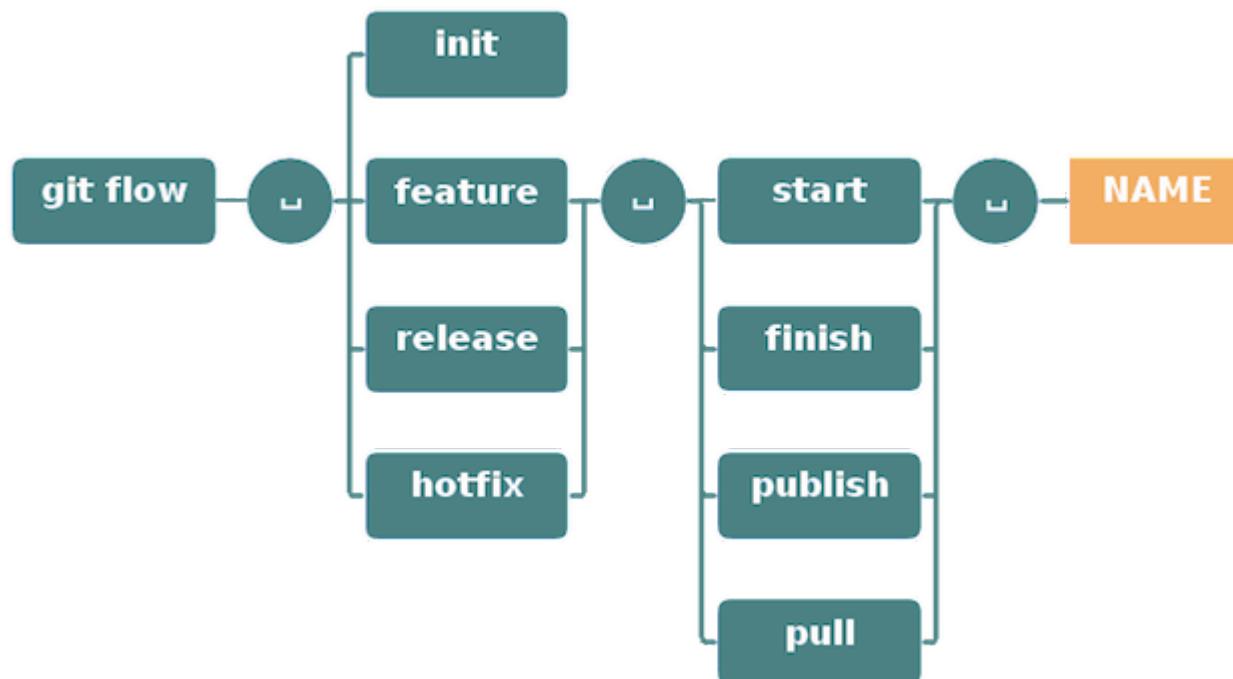
```
$ git diff master stem
```

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 input field labeled 'Search by username, full name or email address' with the 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 field is a button labeled 'Add collaborator'.

Collaboration

Add, Commit and Push like you own it.

Method 2: Fork and Merge

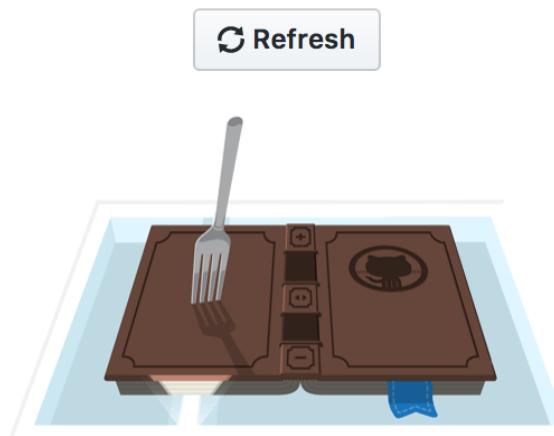


CS ▾

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

Fork and Merge

```
$ git fetch upstream  
$ git merge upstream/master  
$ 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 opening 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, the 'edit index.html' file is shown in a rich text editor with 'Write' and 'Preview' tabs. The preview tab shows the text 'add header, footer tag'. A note at the bottom of the editor 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 + 🧑

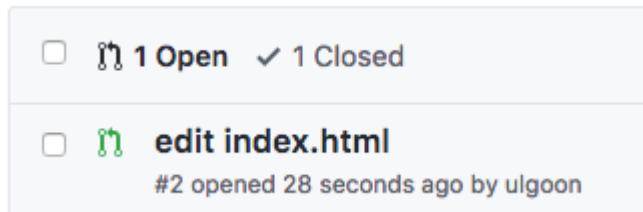
add header, footer tag

 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

Contributor + 🧑‍💻

add header, footer tag

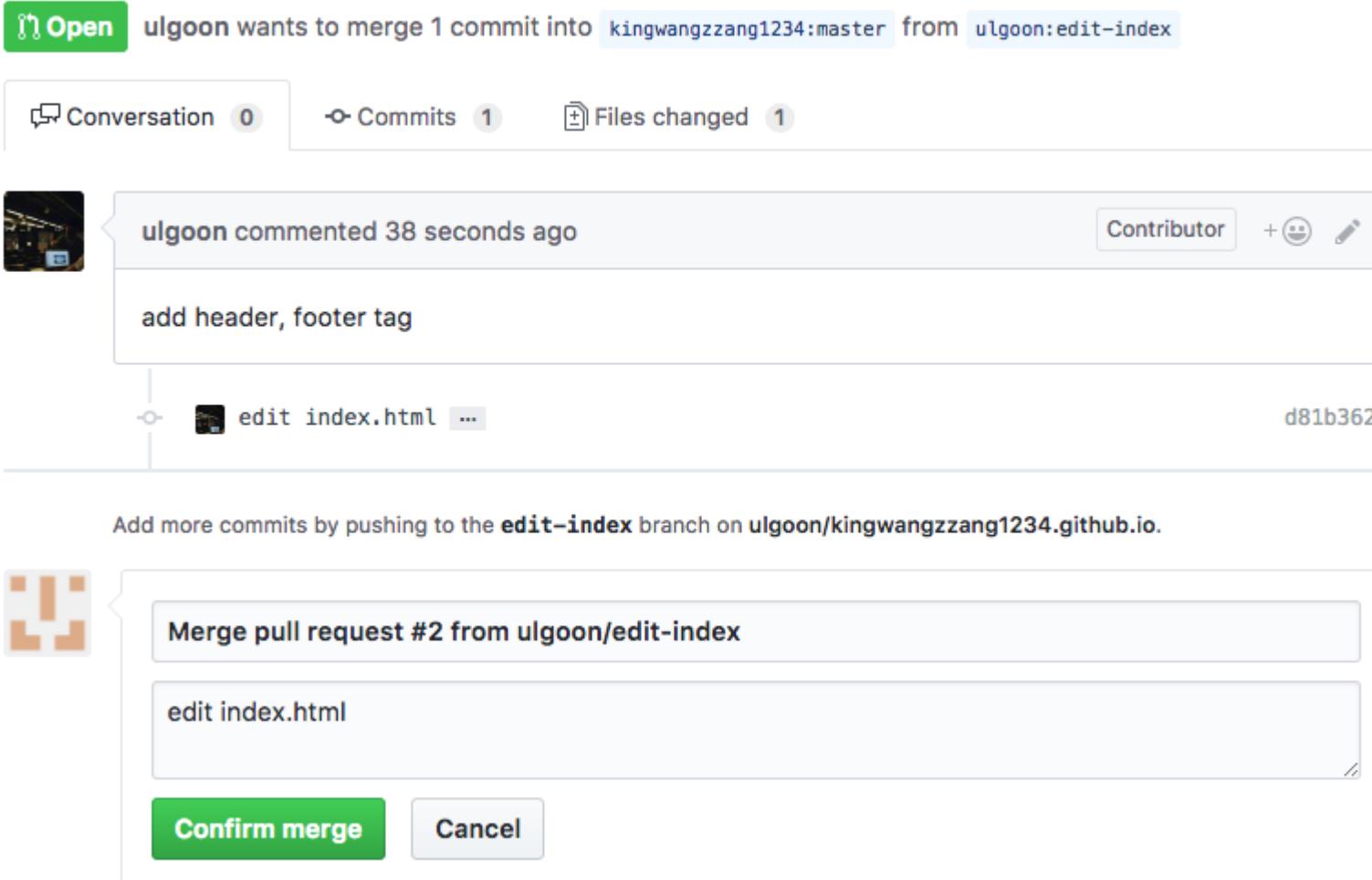
edit index.html ... d81b362

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 bar indicates the merge was successful. Below it, there are tabs for Conversation (0), Commits (1), and Files changed (1). The main area displays a comment from user 'ulgoon' with the message 'add header, footer tag'. Below the comment is a commit from 'edit index.html' with the commit hash 'd81b362'. At the bottom, a merge commit is shown from 'kingwangzzang1234' that merged the commit '45d71fa' into 'kingwangzzang1234:master' just now. A 'Revert' button is available for this merge commit.

Assignment

Try git

마지막 결과를 Print Screen 후 매니저님께 제출해주세요.(100)