Project #0: Install xv6

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V6

- Sixth Edition Unix (Version 6 Unix)
- First version of the Unix to see wide release outside Bell Labs.
  - Released in May 1975
- Designed for DEC PDP-11

상용버전 첫번째 Unix

DEC-PDP11

초창기 컴퓨터

- Original source code has been made available under a BSD License
  - https://minnie.tuhs.org/cgi-bin/utree.pl?file=V6
- Lions' Commentary on UNIX 6th Edition, with Source Code

V6 오픈소스

xv6 operating system

xv6는 v6기반,
x86에서 기능가능하도록.

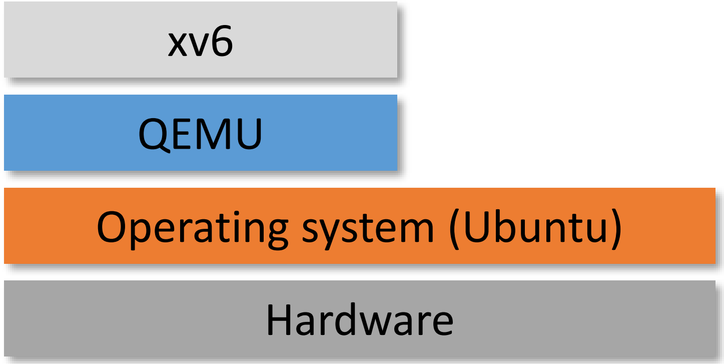
- Unix-like teaching operating system developed by MIT
- Re−implementation of v6 for a modern x86−based multiprocessor using ANSI C.
- **Latest xv6 source**
  - git://github.com/mit-pdos/xv6-public.git
- **Source booklet**
  - https://pdos.csail.mit.edu/6.828/2018/xv6/xv6-rev11.pdf
- **Commentary book**
  - https://pdos.csail.mit.edu/6.828/2018/xv6/book-rev11.pdf
  - The line numbers in this commentary book refer to the source booklet

여기
교재 보기

이 xv6 코드를
기반으로 이해해라.

xv6 operating system (Cont’d)

- **Xv6 does boot on real hardware, but typically we run it using the QEMU emulator**
  - QEMU
    - Open source machine emulator and virtualizer



Setting Up Xv6

1. Setting up environments

```
1) Install Ubuntu 16.04.6 LTS
2) sudo apt-get upgrade
3) sudo apt-get install build-essential
4) sudo apt-get install gcc-multilib
5) sudo apt-get install git
```

2. Install xv6

```
1) cd
2) git clone git://github.com/mit-pdos/xv6-public.git
3) cd xv6-public
4) make
```

Setting Up Xv6 (Cont'd)

3. Install qemu

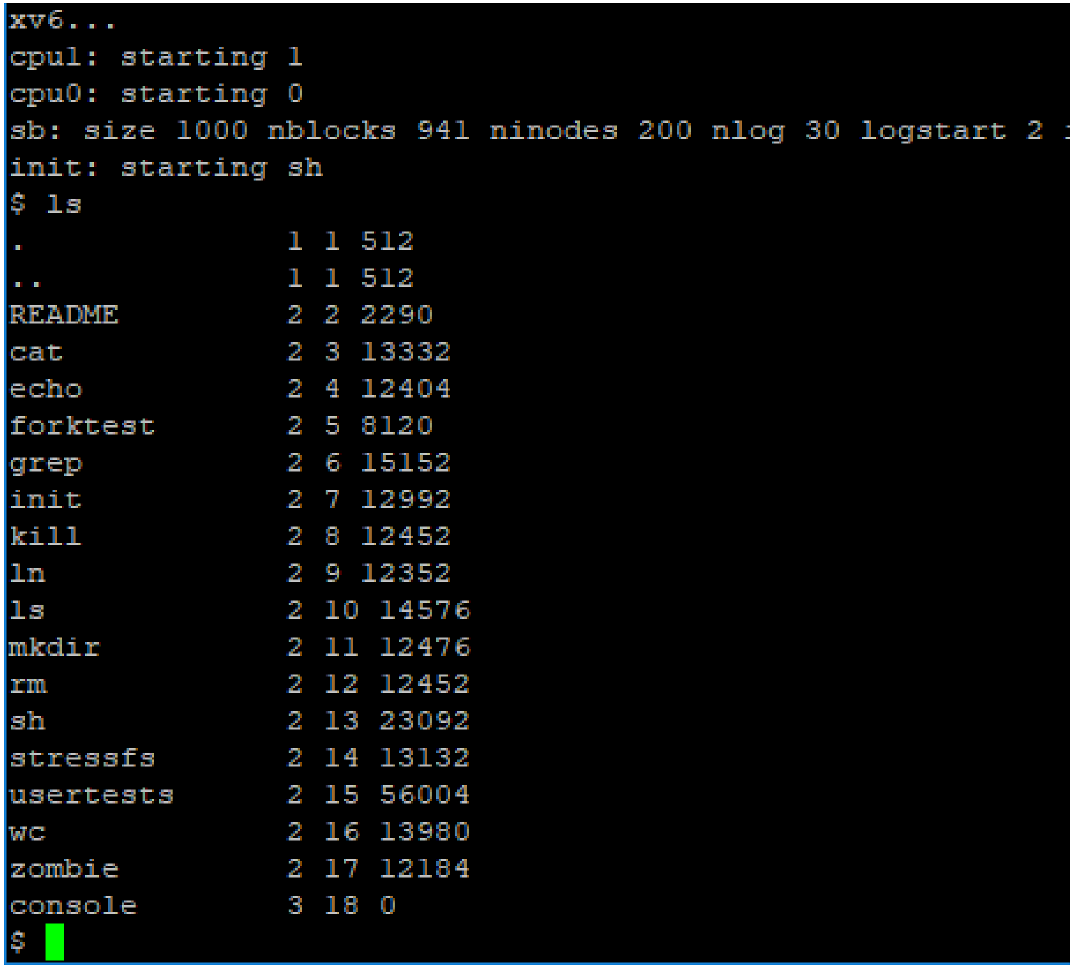
1) `sudo apt-get install qemu`

4. Run xv6

1) `cd`
2) `cd xv6-public`
3) `make qemu-nox`

5. Stop xv6

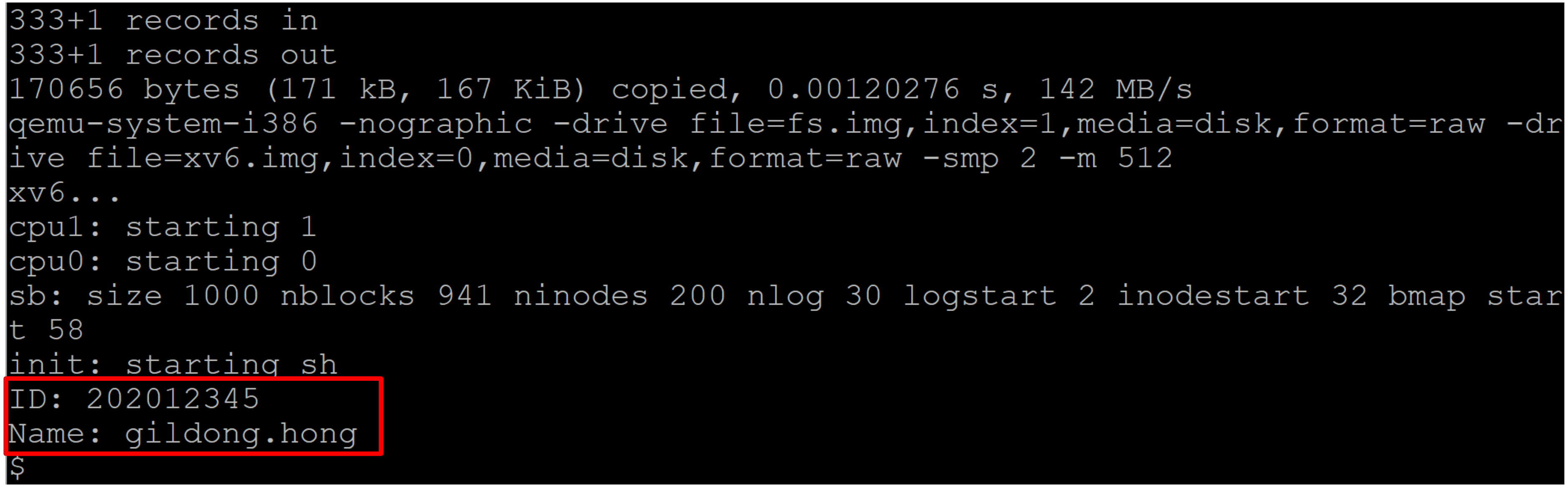
1) `Ctrl-A + X`



```
xv6...
cpu1: starting 1
cpu0: starting 0
sb: size 1000 nblocks 941 ninodes 200 nlog 30 logstart 2
init: starting sh
$ ls
.              1 1 512
..             1 1 512
README         2 2 2290
cat            2 3 13332
echo           2 4 12404
forktest       2 5 8120
grep           2 6 15152
init           2 7 12992
kill           2 8 12452
ln             2 9 12352
ls             2 10 14576
mkdir          2 11 12476
rm             2 12 12452
sh             2 13 23092
stressfs       2 14 13132
usertests      2 15 56004
wc             2 16 13980
zombie         2 17 12184
console        3 18 0
$
```

Project #0 –Install Xv6

- Follow the instructions above
- Print your student ID & name in the xv6 boot message
  - This means that you have to find initial program code then insert your code into it.



```
333+1 records in
333+1 records out
170656 bytes (171 kB, 167 KiB) copied, 0.00120276 s, 142 MB/s
qemu-system-i386 -nographic -drive file=fs.img,index=1,media=disk,format=raw -dr
ive file=xv6.img,index=0,media=disk,format=raw -smp 2 -m 512
xv6...
cpu1: starting 1
cpu0: starting 0
sb: size 1000 nblocks 941 ninodes 200 nlog 30 logstart 2 inodestart 32 bmap star
t 58
init: starting sh
ID: 202012345
Name: gildong.hong
$
```

Submission

- **Capture a screenshot of qemu emulator**
  - Please change the image file name into `YourStudentID.jpg`
- **Compress your code as `YourStudentID-0.tar.gz`**
  - `$ cd xv6-public`
  - `$ make clean`
  - `$ cd ..`
  - `$ tar -czvf YourStudentID-0.tar.gz ./xv6-public`
  - Please command `$ make clean` before compressing
- **Submit your files through PLATO**
- **Due date: 4/5 23:59**
  - Late submission penalty (-25% penalty of total mark per day)

Tips

- Reading xv6 commentary will help you a lot
  - https://pdos.csail.mit.edu/6.828/2018/xv6/book-rev11.pdf
    - The line numbers in this book refer to the source booklet below
    - Reading chap. 1 of xv6-commentary will help your project
      - Code: creating the first process
      - Code: Running the first process
      - The first system call: exec
  - https://pdos.csail.mit.edu/6.828/2018/xv6/xv6-rev11.pdf

Appendix. cscope

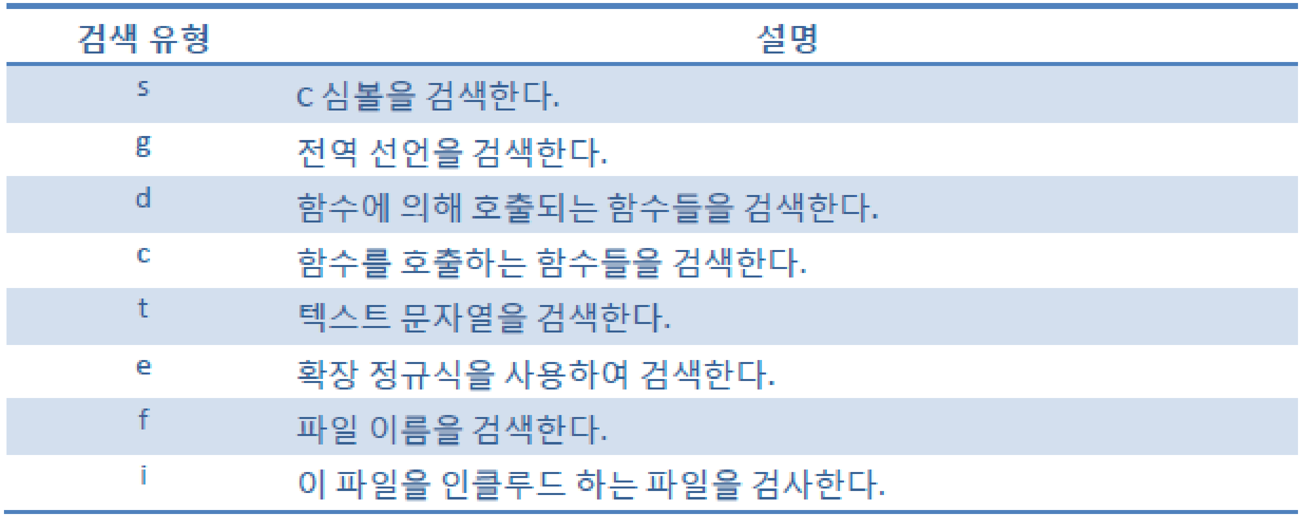
- **Install cscope**
  - `$ sudo apt-get install cscope`

- **Using Cscope with Vim**
  - `$ wget http://cscope.sourceforge.net/cscope_maps.vim`
  - `$ mkdir -p ~/.vim/plugin`
  - `$ cp cscope_maps.vim ~/.vim/plugin`

- **Creating cscope database**
  - `$ cscope -Rb`
  - Linux kernel의 경우
    - `$ make cscope`

Appendix. cscope

- **Usage**
  - `cscope -Rb` : tag 생성
  - `Ctrl + ]` : 커서가 위치한 함수의 정의 부분으로 이동
  - `Ctrl + t` : 이전 위치로 이동
  - `:cs find (검색유형) (검색어)`
  - `Ctrl + \ +(검색유형)`



검색 유형	설명
s	C 심볼을 검색한다.
g	전역 선언을 검색한다.
d	함수에 의해 호출되는 함수들을 검색한다.
c	함수를 호출하는 함수들을 검색한다.
t	텍스트 문자열을 검색한다.
e	확장 정규식을 사용하여 검색한다.
f	파일 이름을 검색한다.
i	이 파일을 인클루드 하는 파일을 검사한다.

  - http://csl.skku.edu/uploads/SSE3044F12/vim_ctags_cscope.pdf