

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



DEC-PDP11

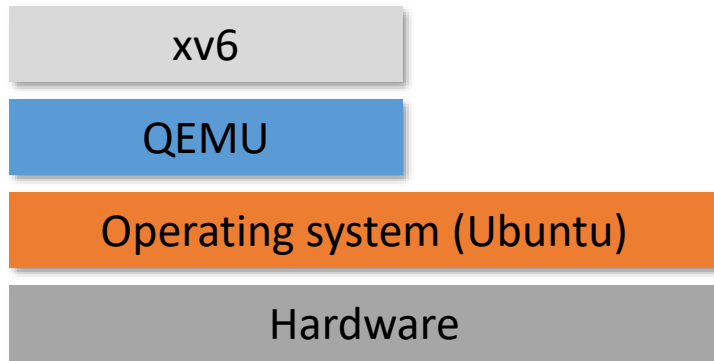
- Original source code has been made available under a BSD License
 - <https://minnie.tuhs.org/cgi-bin/utree.pl?file=V6>
- Lions' Commentary on UNIX 6th Edition, with Source Code

xv6 operating system

- 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

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. Download **xv6-public.tar.gz** from PLATO

3. Install xv6

- 1) `tar -xzvf xv6-public.tar.gz`
- 2) `cd xv6-public`
- 3) `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...
cpul: 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: **3/23 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