

EEE3052: Introduction to Operating Systems

Fall 2017

Project #0

Operating System

- What is an "operating system"?
 - A software that application software operates on



Linux



Xv6

- A simple Unix-like teaching operating system
 - Developed by MIT
 - Execution on multi-core x86 systems
 - Port of the sixth edition Unix (v6) in ANSI C

Project Plan

- 4 projects
 - 0) Install Xv6
 - 1) Process management
 - 2) Virtual memory
 - 3) Scheduling
 - 4) File system
-
- ```
graph LR; A[1) Process management] --- B[2) Virtual memory]; A --- C[3) Scheduling]; A --- D[4) File system]; C --- E["50 point"]; D --- F["50 point"];
```

- Each project is individual (NOT TEAM)
  - Total project score : 100 point
  - Total project score will be ZERO, if copy detected

# Set Up Environment

- Install Ubuntu 16.04 LTS
- Download packages
  - sudo apt upgrade
  - sudo apt install build-essential
  - sudo apt install gcc-multilib
  - sudo apt install git

# Install Xv6

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- Download from git
  - cd
  - git clone git://github.com/mit-pdos/xv6-public.git
- Download from CSL homepage
  - cd
  - wget <http://csl.skku.edu/uploads/EEE3052F17/xv6-public.tar.gz>
  - tar xvf xv6-public.tar.gz

# Install Xv6 (Cont.)

- Build Xv6
  - cd xv6-public
  - make

# Install QEMU

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- Install QEMU

- cd
- git clone <https://github.com/geofft/qemu.git> -b 6.828-1.7.0
- sudo apt install libsdl1.2-dev
- sudo apt install autoconf
- sudo apt install libtool

# Install QEMU

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- Build QEMU
  - cd qemu
  - git submodule update --init pixman
  - ./configure --disable-kvm --target-list="i386-softmmu x86\_64-softmmu" --disable-werror
  - make
  - sudo make install



```
csl@ubuntu:~$./configure --disable-kvm --target-list="i386-softmmu x86_64-softmmu" --disable-werror
```

# Run Xv6

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- Run Xv6
  - cd
  - cd xv6-public
  - make qemu-nox
- Stop Xv6
  - ctrl + a
  - x

# Project #0 – Install Xv6

- Follow the instructions above
- Print below contents in the Xv6 boot message
  - Student ID
  - Name
  - Free message

```
csl@ubuntu:~/xv6-public$ make qemu-nox
dd if=/dev/zero of=xv6.img count=10000
10000+0 records in
10000+0 records out
5120000 bytes (5.1 MB, 4.9 MiB) copied, 0.0235716 s, 217 MB/s
dd if=bootblock of=xv6.img conv=notrunc
1+0 records in
1+0 records out
512 bytes copied, 0.000145709 s, 3.5 MB/s
dd if=kernel of=xv6.img seek=1 conv=notrunc
333+1 records in
333+1 records out
170856 bytes (171 kB, 167 KiB) copied, 0.000697514 s, 245 MB/s
qemu-system-i386 -nographic -drive file=fs.img,index=1,media=disk,format=raw -drive file=xv6.img,index=0,media=disk,format=raw -smp 2 -m 512
(process:20236): GLib-WARNING **: /build/glib2.0-prJhLS/glib2.0-2.48.2//glib/gmem.c:483: custom memory allocation vtable not supported
xv6...
cpu1: starting 1
cpu0: starting 0
sb: size 1000 nblocks 941 ninodes 200 nlog 30 logstart 2 inodestart 32 bmap start 58
init: starting sh
Student ID: 2013456789
Name: Jaehyun Song
Message: Welcome
$
```

# Tools - cscope

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- You can easily read source code
- Download
  - sudo apt install cscope
- Setup
  - cd ~/xv6-public
  - cscope -R
  - ctrl + D
  - vi ~/.vimrc →   
set cst  
cs add /home/csl/xv6-public/cscope.out /home/csl/xv6-public/  
Check your path!
  - wq

# Tips

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- cscope & ctags
  - Enter function: `ctrl + ]`
  - Return previous position: `ctrl + t`
- Grep
  - `grep -nr "text"`
  - You can find the line which has "text"

# Submit

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- Send email to [jaehyun.song@csl.skku.edu](mailto:jaehyun.song@csl.skku.edu)
  - Title of "[EEE3052]Project-0-2013456789-송재현"
- Due date
  - 2017/09/10 Sunday 23:59:59
- TA contact
  - [jaehyun.song@csl.skku.edu](mailto:jaehyun.song@csl.skku.edu) (**ONLY THIS EMAIL**)
- Delay rule
  - Penalty 10% of each project score per one day