

Lec 2

Linux, Editors, Compilers

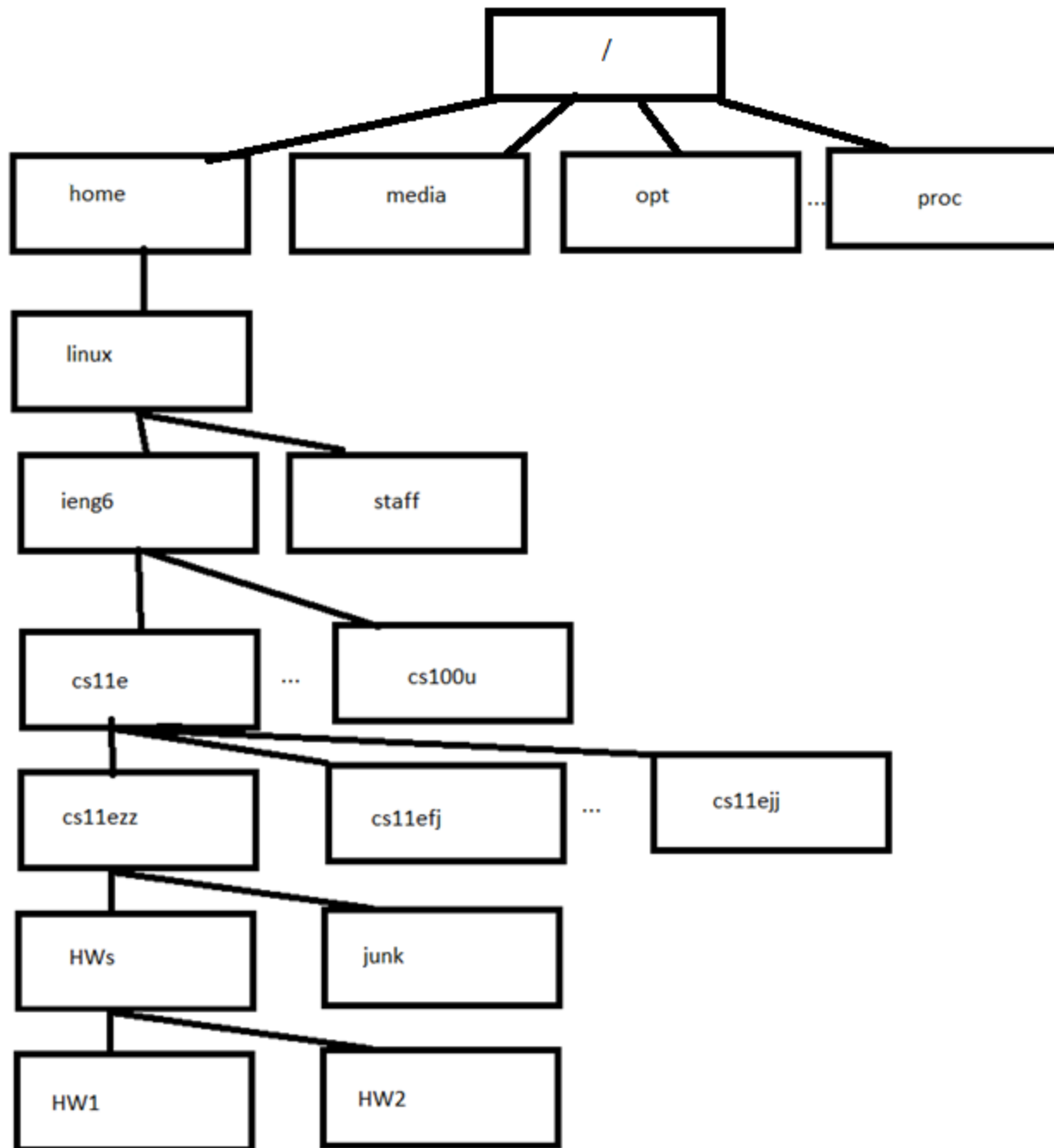
Today

- Finish course setup
 - Enter your programming experience
 - Buy the book
 - Enroll in piazza
- Discussion CENTR 212. 5:00 – 5:50
 - Bring laptops
- HW1 online

Bash

```
for i in `awk '{print $1}' file1| uniq`;
do
    grep $i file2 | head -1 | \
        awk '{print $1 "\t" $2 "\t" $3}' | tr '\n' '\t';
    for j in `seq 4 50`;
    do
        grep $i mpi_app_results-16.csv | \
            awk "{print \$\"$j\"}" > z1.out;
        python ../../nearest_3.py; done | tr '\n' '\t';
        echo;
    done;
done >> zmpi16
```

Navigation



Directories

- `/` - The root directory
- `.` – Current directory
- `../` - one directory up
- `~/` - your home directory (unique to each user)

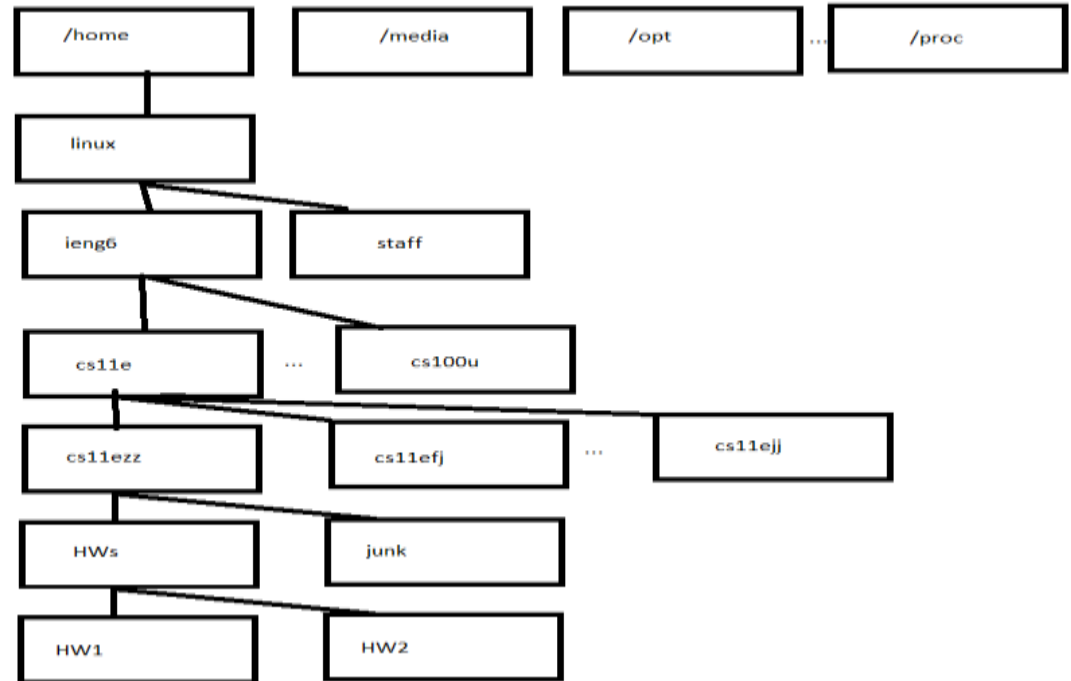
Key commands

- `cd <directory>` - change directory
 - Absolute path
 - `cd /home/cs11/cs11wb/HW1/`
 - Relative path
 - `cd ../../HW2/submit/`
- `mkdir <path/dir_name>` – make directory
 - `mkdir ../HW3`
- `ls <directory>` - list contents of directory
 - `ls /home/cs11/cs811wb/`
- `pwd` – which directory am I currently in
 - `/home/ieng6/linux/cs11/cs11wb`

Running `pwd` returns

`/home/linux/ieng6/cs11e/cs11ezz/HWs/HW1`

Which command(s) would navigate you to “junk”



A) `cd ../../junk`

B) `cd ../../junk`

C) `cd /home/linux/ieng6/cs11e/cs11ezz/HWs/../../junk`

➡ D) A & C

E) A, B, & C

Useful commands

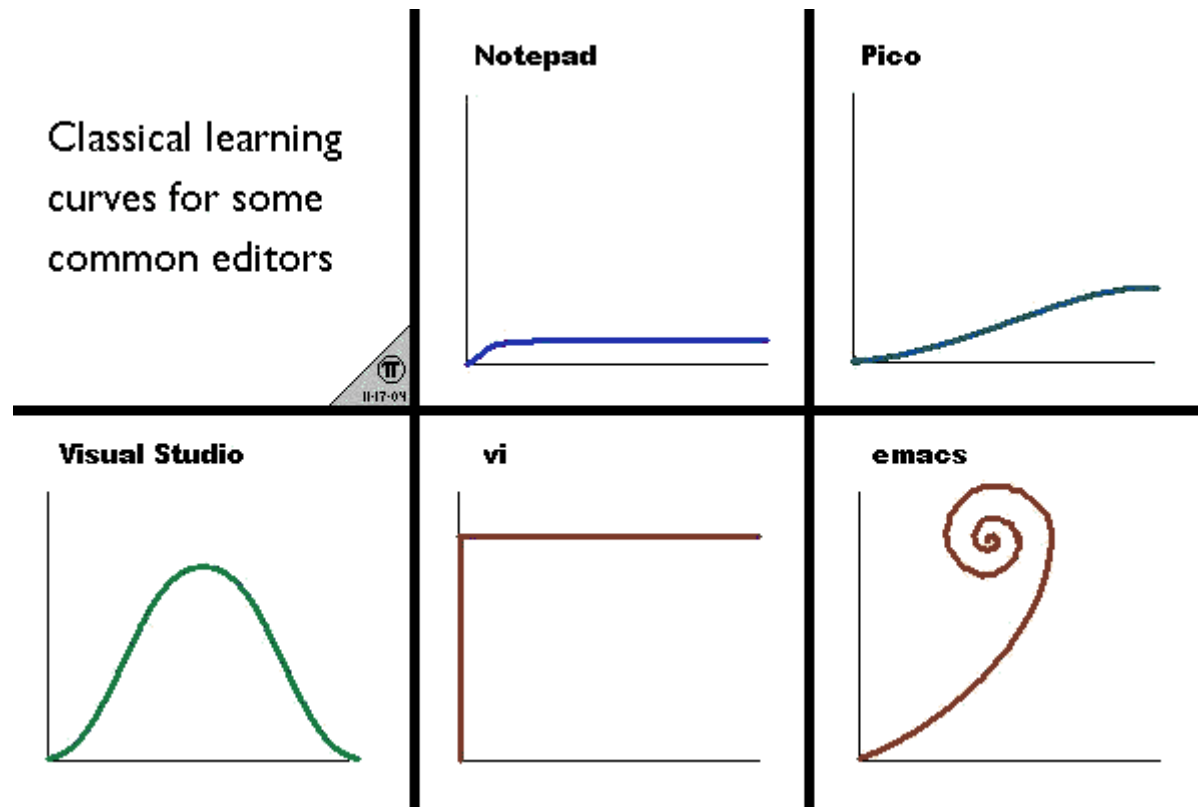
- `cp <path/file1> <path/file2>` - copy file1 to file2
 - `cp /home/cs11e/cs11ezz/Test.java ../Test.java.bk`
 - `cp /home/cs11e/cs11ezz/Test.java ../`
- `mv <path/file1> <path/file2>` - move file1 to file2
- `rm <path/file>` - remove file
 - `rm ../HW2/README`

How could you rename a file

I want to rename the file “adam.java” to “hw1.java”. Which command(s) could I use?

- A) `cp adam.java hw1.java`
- B) `rm adam.java hw1.java`
- C) `mv adam.java hw1.java`
- D) `rename adam.java hw1.java`
- ➡ E) (a) and (c)

Editors



<http://mrozekma.com/editor-learning-curve.png>

Key commands

- emacs
 - Ctrl-x Ctrl-s – save file
 - Ctrl-x Ctrl-c – close file
- vi(m)
 - i – insert text
 - “esc” :w – save file
 - “esc” :q – close file
 - “esc” :wq – save and close the file

01000011 01000001 01010100

0000

01000011

43

01001111

4F

01010100

54

Programming Levels

- Machine code

```
55
89 e5
83 e4 f0
83 ec 20
c7 44 24 1c 00 00 00
```

Binary	Hex	Decimal
0000	0	0
0001	1	1
0010	2	2
0011	3	3
0100	4	4
0101	5	5
0110	6	6
0111	7	7
1000	8	8
1001	9	9
1010	A	10
1011	B	11
1100	C	12
1101	D	13
1110	E	14
1111	F	15

Programming Levels

- Machine code

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```

- Assembly languages

```
; Example of IBM PC assembly language
; Accepts a number in register AX;
; subtracts 32 if it is in the range 97-122;
; otherwise leaves it unchanged.
```

```
SUB32 PROC      ; procedure begins here
    CMP  AX,97   ; compare AX to 97
    JL   DONE    ; if less, jump to DONE
    CMP  AX,122  ; compare AX to 122
    JG   DONE    ; if greater, jump to DONE
    SUB  AX,32   ; subtract 32 from AX
DONE: RET       ; return to main program
SUB32 ENDP      ; procedure ends here
```

FIGURE 17. Assembly language

Programming Levels

- Machine code

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```

- Assembly languages

```
push    ebp
mov     ebp,esp
and     esp,0xffffffff
sub     esp,0x20
mov     DWORD PTR [esp+0x1c],0x0
```

- High level languages

```
hello.c x
/* Hi ..this is simple c program, just for explaining compiling steps in
Ubuntu 11.10 */

#include<stdio.h>

void main()
{
    printf("Hello! This is my first C program with Ubuntu 11.10\n");
    /* Do something more if you want */
}
```

Programming Levels

- Machine code

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- Assembly languages

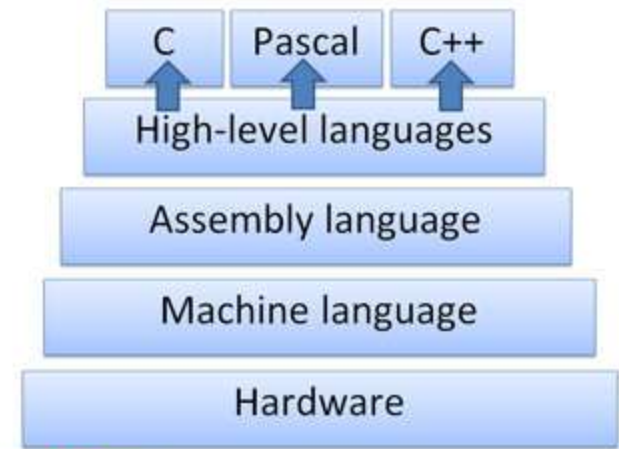
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```



Teach-ICT.com

You compile a non-java program on your desktop (it uses a Intel x86 processor) and then email the program to your friend to run on his system (it uses an AMD processor). Will it execute? Why?



- A) Yes. The program is already down to machine code and can execute anywhere
- B) Yes. Your friend's system will automatically translate the program into a format it can execute
- C) No. The machine code will be different on the 2 systems
- D) No. Your friend's system may not have the compiler/assembler installed.