CSE 330: Operating Systems

Class: 02 **Date:** 8/23

Fall 2016

Note Title

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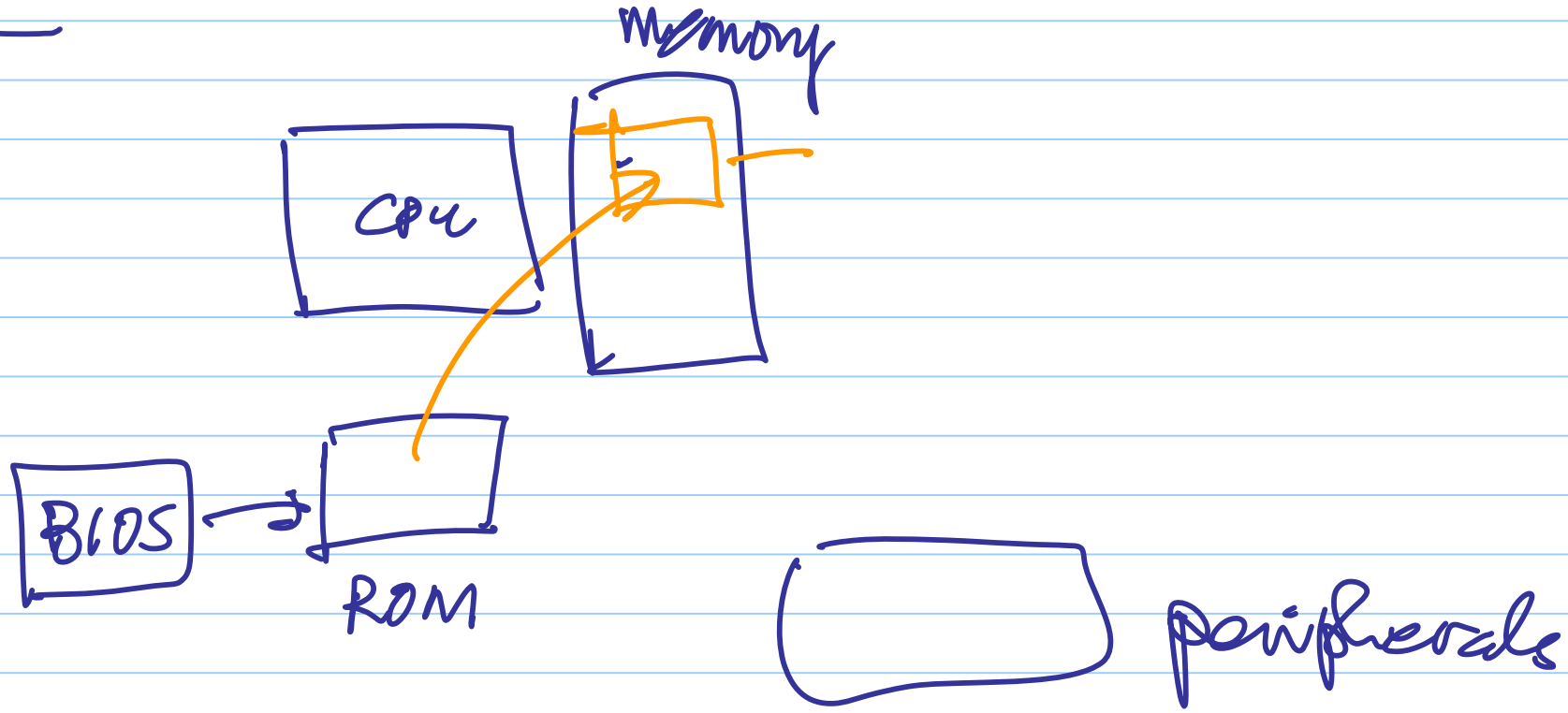
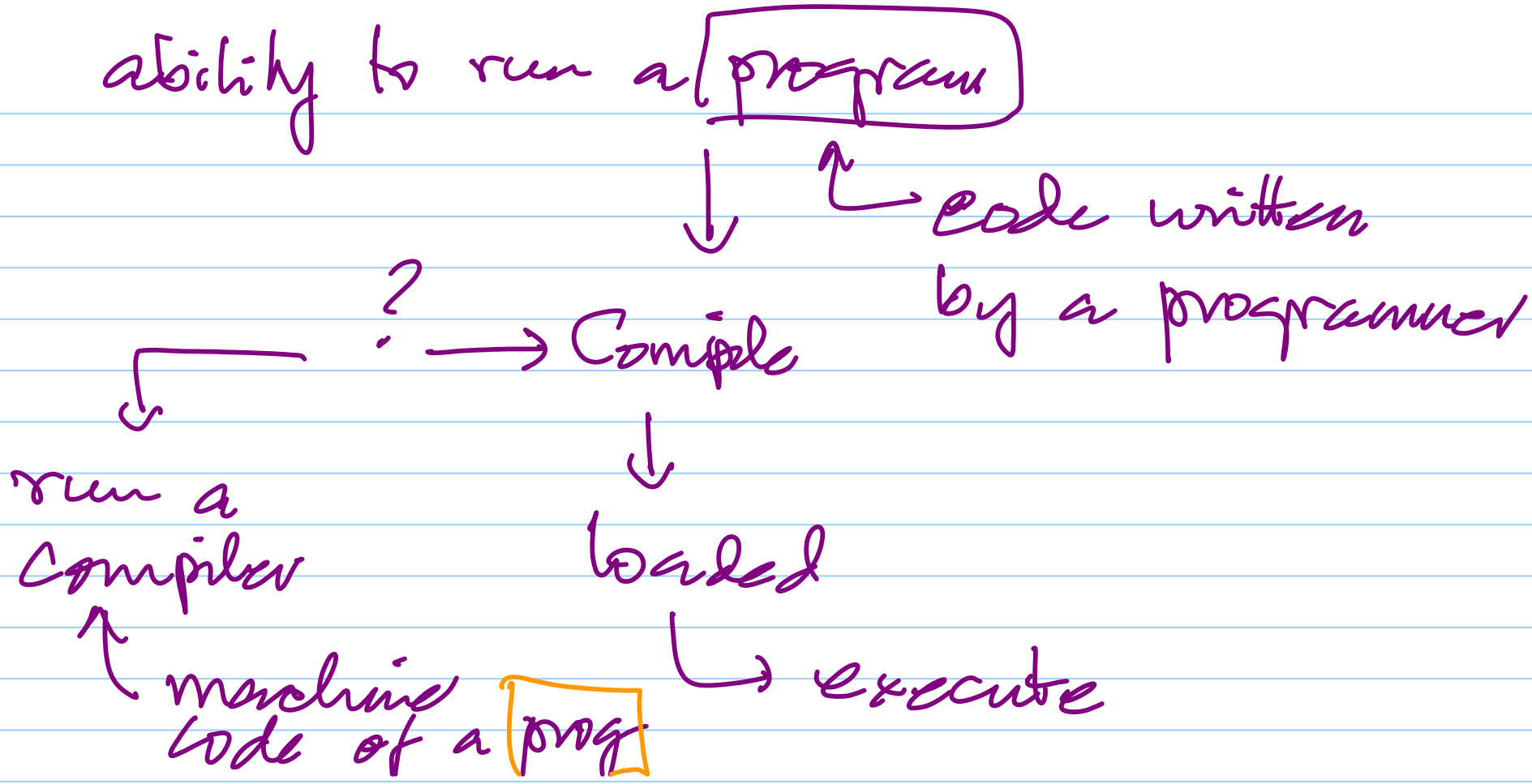
Recitation

OS




ability to run a program
code written by a programmer
?
Compile
run a compiler
loaded
machine code of a prog
execute

Bootstrap loader → a prog that loads other programs.

↳ a program (loader) that loads itself

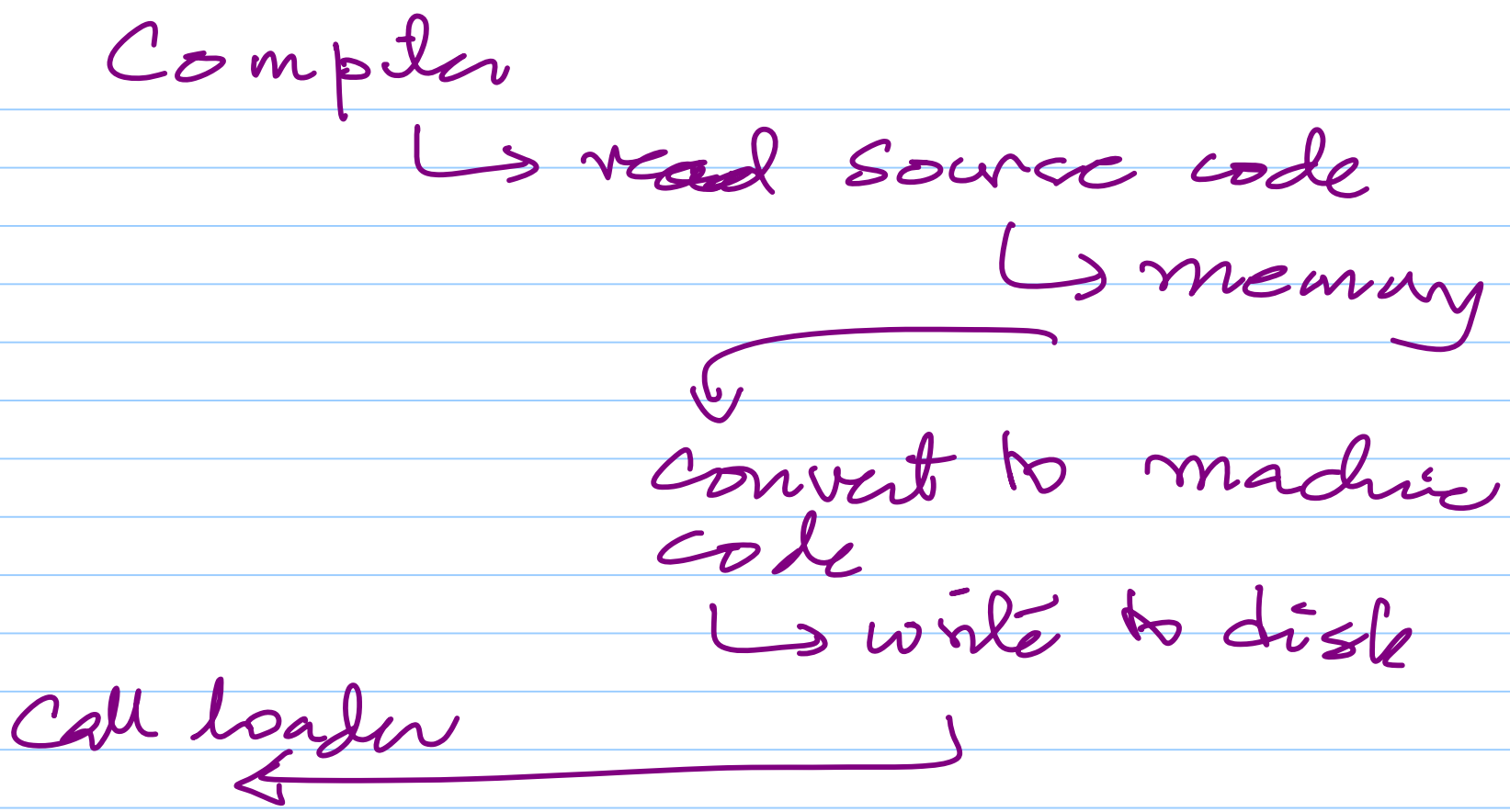
↳ copy from storage to memory.

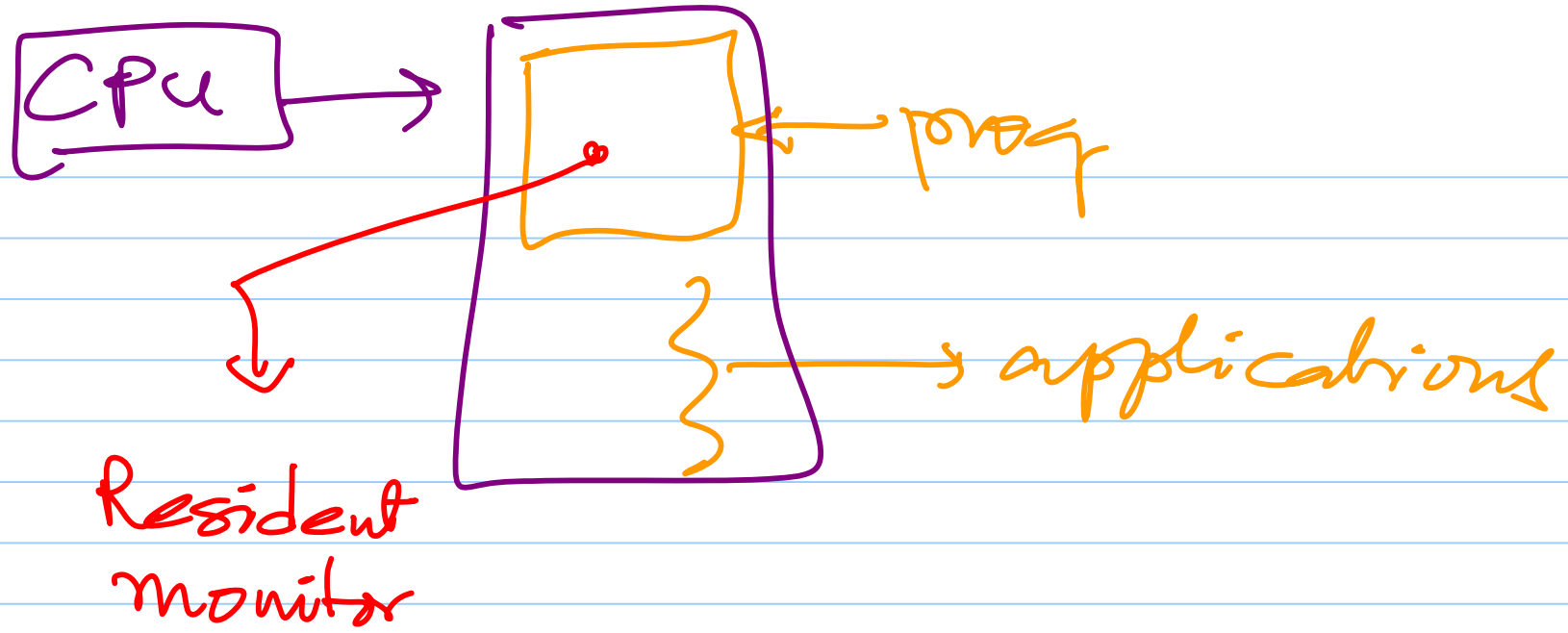
Bootloader → loader →

loads a compiler

executes it

makes the PC point to the first instruction


Compiler
read source code
memory
convert to machine code
write to disk
call loader


CPU
prog
applications
Resident
monitor

Resident monitor

→ runs 1 program at a time

→ needs human input

?

→ also needs protection & control

protection

↳ memory protection

↳ CPU protection

↑

Supervisory control

(privileged mode)

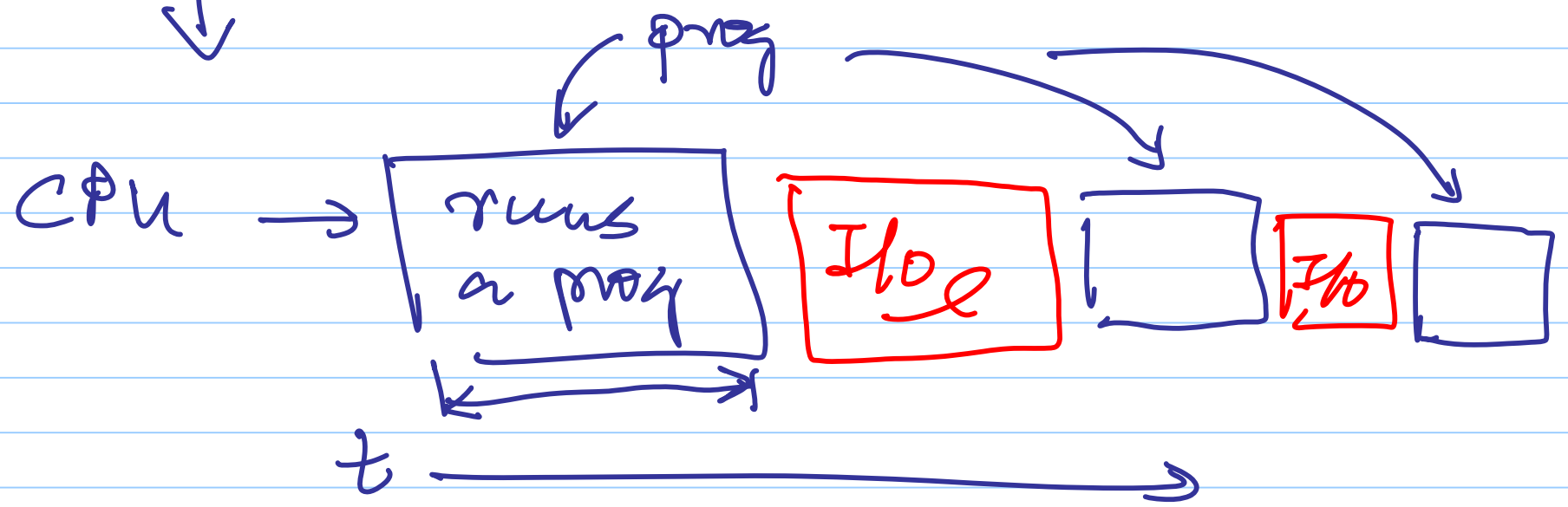
① protection & control

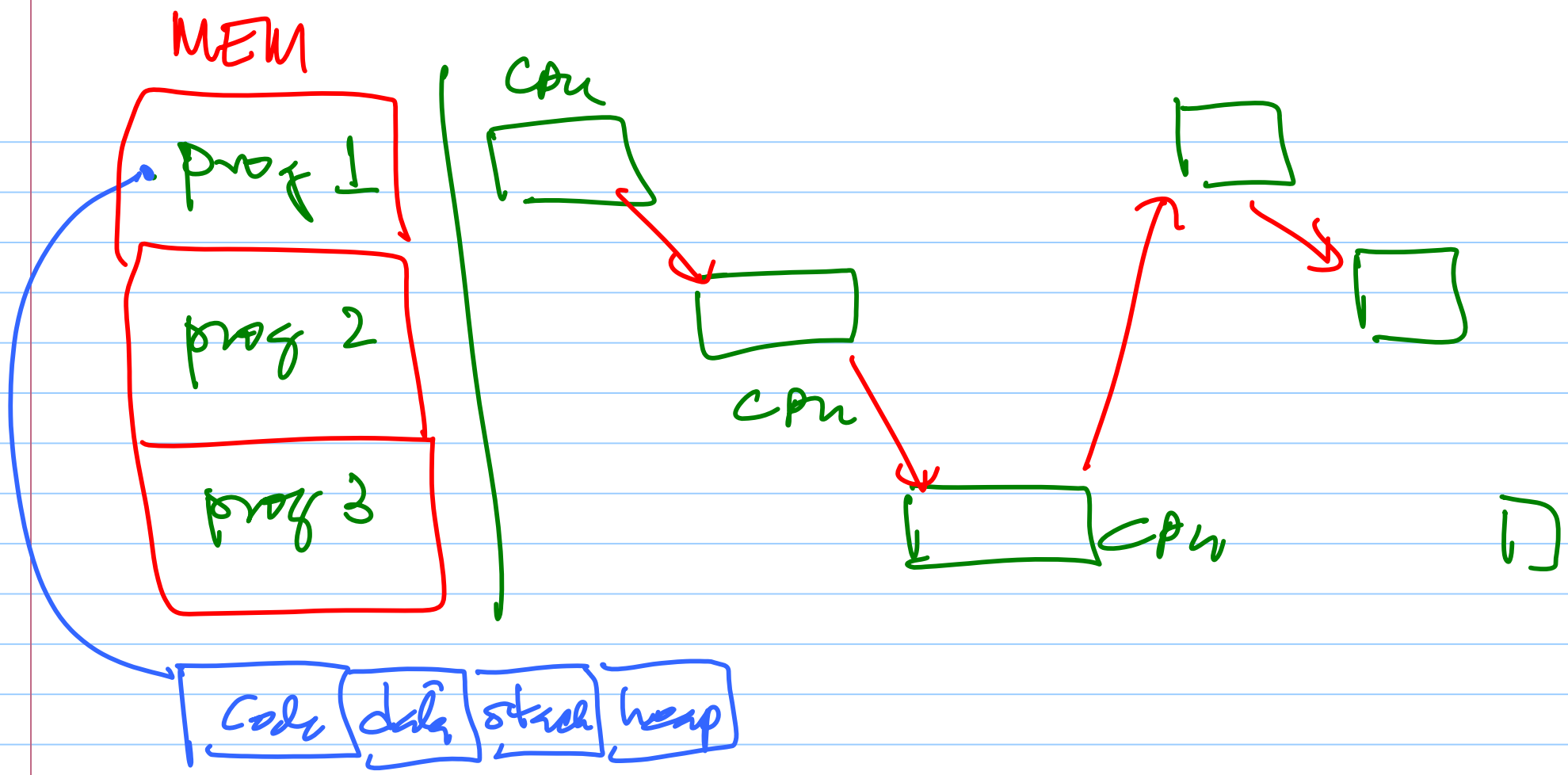
② multiple applications
+ memory allocation

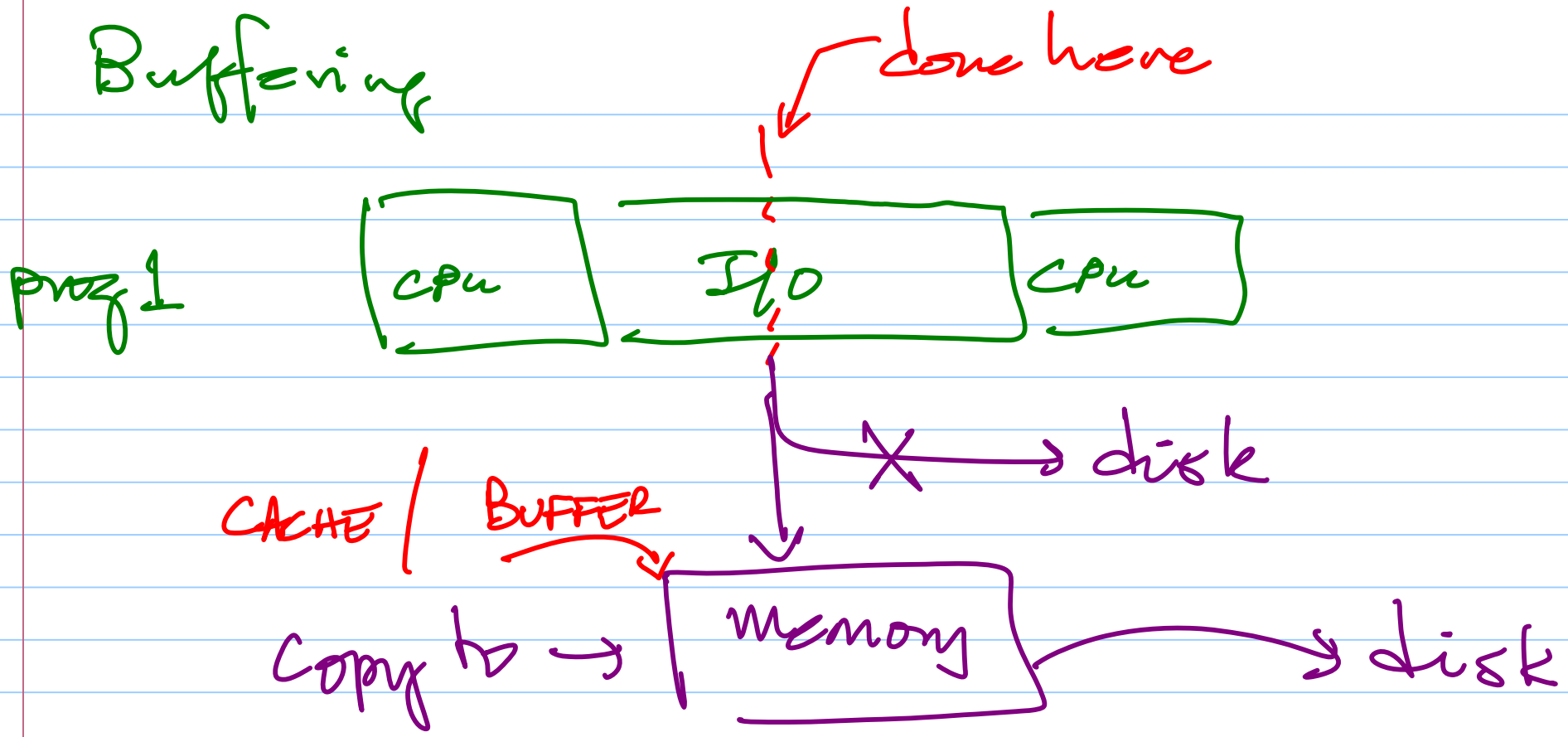
③ caching / buffering / spooling

④ file systems

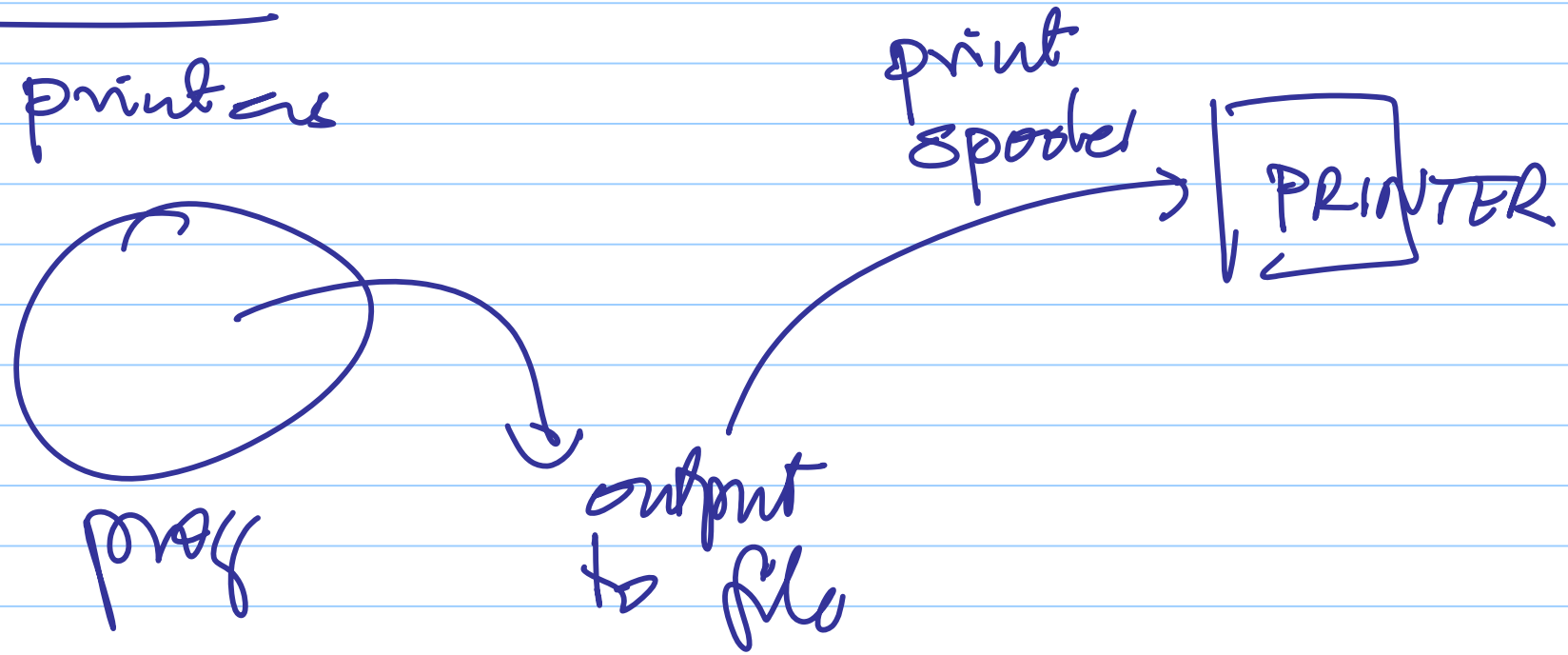
multiple applications (tasks, jobs, processes)




MEM
prog 1
prog 2
prog 3
CPU
CPU
CPU
Code
data
stack
heap


Buffering
done here
prog 1
CPU
I/O
CPU
disk
CACHE / BUFFER
copy to →
memory
disk

SPOOLING



What is an operating system?

1. Software (resident in memory)
   - + support programs
   - "KERNEL"
2. Set of functions
   - → system calls
   - → interrupt handlers
   - → kernel routines

3 Resource Manager

- CPU
- memory
- secondary storage
- network

+ ?

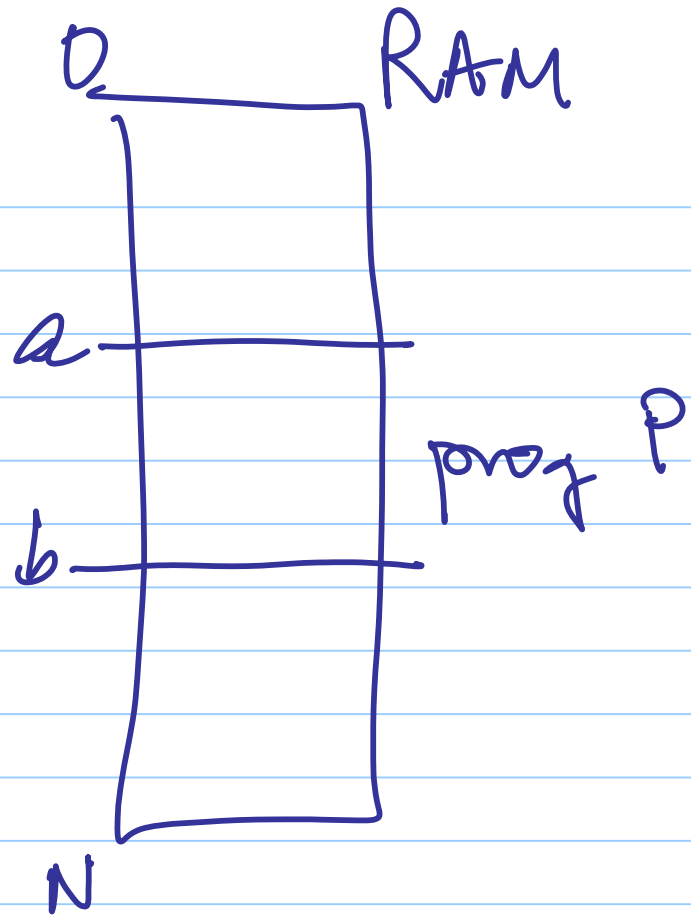
Protection

memory protection

addr

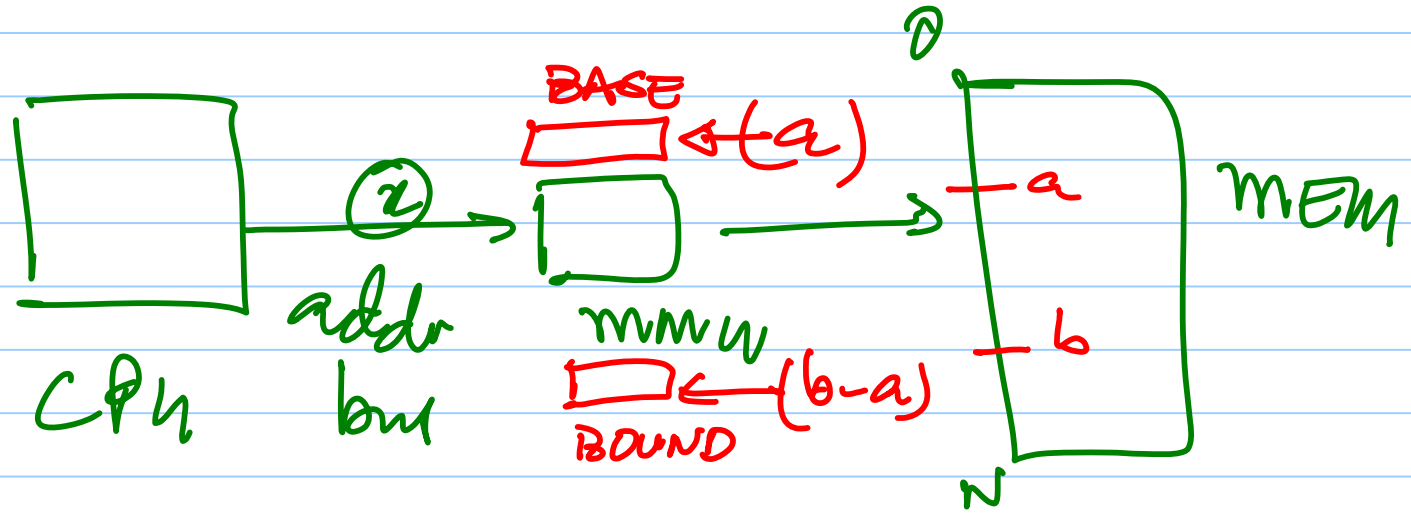
LOAD $R_1 \leftarrow (x)$

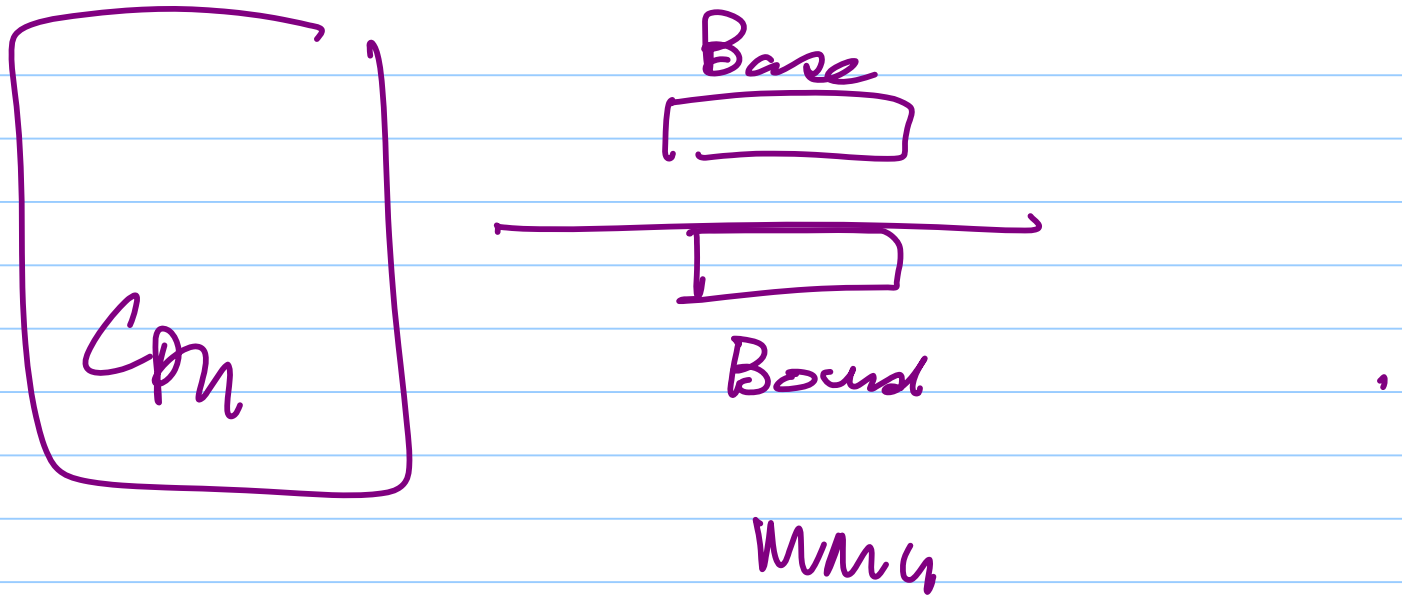
STO $R_1 \rightarrow (x)$



Memory protection done by
Separate hardware (MMU)
(mem mgmnt unit)

Bounds checker

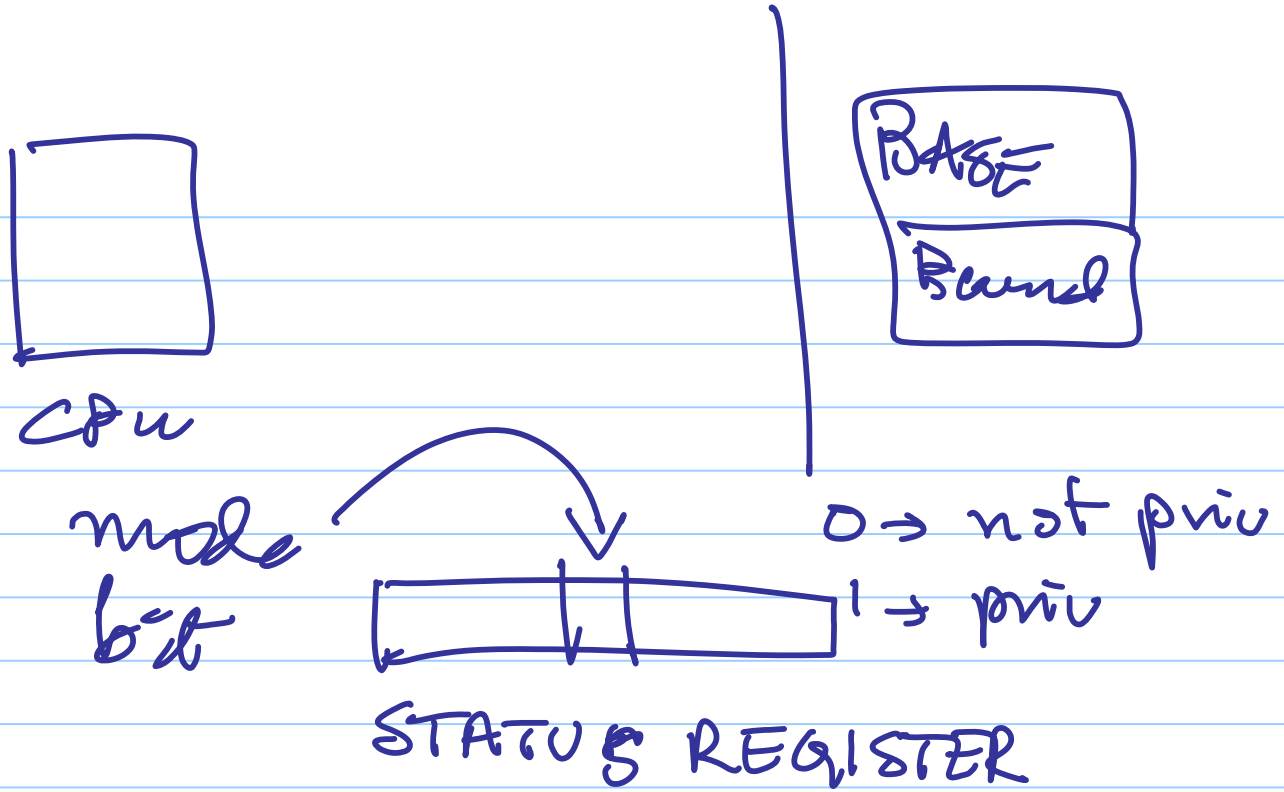


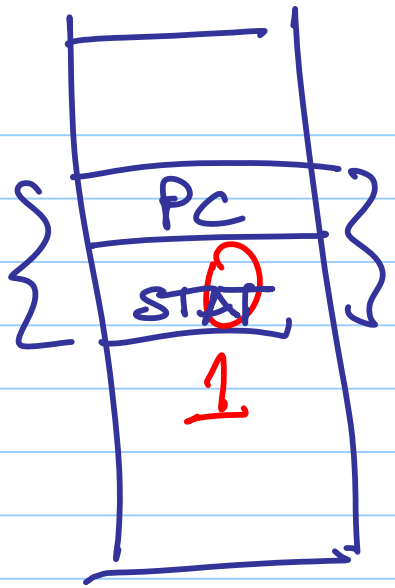


Instruction → "change Base register"

restrict execution of "change base"

IDEA → privileged instruction


BASE
Bound
CPU
mode bit
0 → not priv
1 → priv
STATUS REGISTER



INT VECTOR

INTERRUPT

↓

load IV.PC

↳ PC

load IV.STATUS

↳ STATUS