

Activity 1.1

Should disabling interrupt be a privileged instruction, i.e., should we allow it to run in user mode, kernel mode, or both? Why?

- ☐ Kernel mode only. Otherwise user processes may maliciously hoard the CPU
- ☐ User mode only. There's no need for the Kernel to disable timer, otherwise kernel might run into infinite loop
- ☐ Both mode. It should be the discretion of the programmer to enable/disable interrupt and it should always be allowable in any mode

Activity 1.1

If a process keeps computing (never gives up the CPU voluntarily), what do you think drives the switch to another process?

- ☐ Other Processes wanting to take over the CPU
- ☐ The Kernel
- ☒ Timer Interrupts
- ☐ Nothing, we cannot ever switch out this process if it doesn't give up the CPU voluntarily

Activity 1.1

↗ time sharing

Concurrently running programs are possible even if you have only one CPU. How can that happen?

- ☐ Each program queues to wait for the current program to run into completion
- ☐ It is impossible to happen, the statement is false. We need to have multi-core CPU.
- ☒ Context switch is performed by the Kernel

Activity 1.1

If each process runs on its own virtual CPU, what needs to be:

- (i) Saved when I switch out a process;
- (ii) Restored when I switch in a process?
- (iii) Where do I save to or restore from?

- ☐ (i) CPU Hardware state: Register States, PC value
 - (ii) Same as (i) ✓
 - (iii) Main Memory → *process table*
- ☐ (i) CPU Hardware state: Register States, PC value
 - (ii) Main Memory
 - (iii) Cache → *must hold data of currently running process*
- ☐ (i) Main memory state
 - (ii) same as (i)
 - (iii) Registers
- ☐ (i) Interrupt Handlers
 - (ii) Same as (i)
 - (iii) Main Memory

Activity 1.1

There exist multiple programs making progress at the same time in your computer

☒ True

☐ False

Activity 1.2

Roughly speaking, there is an OS subsystem responsible for managing each of the computing system components mentioned in the lecture. What are some of the major OS subsystems?

mem management → resource management

power —————

scheduler

security

process

Activity 1.2

What functional components should a computer system have? Select all that applies.

- ☒ Memory Devices (main memory, cache)
- ☐ Output Devices (monitors, speakers)
- ☒ CPU
- ☒ Network Connection (WiFi, ethernet)
- ☒ Secondary Storage (disk, ssd)
- ☐ Input Devices (keyboard, mouse, microphone)