



國立陽明交通大學  
NATIONAL YANG MING CHIAO TUNG UNIVERSITY

Institute of Artificial Intelligence Innovation  
Department of Computer Science

# *Operating System*

## **Question Examples of Midterm**

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Wed. 10:10 - 12:00 EC115 +  
Fri. 11:10 – 12:00 Online



# Midterm Exam will Cover

W	Date	Lecture	Online	Homework
1	Sept. 4	Lec00: Course Overview & Historical Prospective		
2	Sept. 11	Lec01: Introduction	V	
3	Sept. 18	Lec02: OS Structure	V	HW01 Due 10/5
4	Sept. 25	Lec03: Processes Concept	X	
5	Oct. 2	Typhoon – No class	V	
6	Oct. 9	Lec07: Memory Management	V	
7	Oct. 16	Lec08: Virtual Memory Management	V	HW02 Due 11/2
8	Oct. 23	Lec04: Process Scheduling (Part of it)	V	
9	Oct. 30	School Midterm Exam		
10	Nov. 6	Lec05: Process Synchronization	V	HW03
11	Nov. 13	Lec06: Deadlocks	V	
12	Nov. 20	School Event – No class		
13	Nov. 27	Lec09: File System Interface	V	HW04
14	Dec. 4	Lec10: File System Implementation	V	
15	Dec. 11	Lec11: Mass Storage System & Lec12: IO Systems	V	
16	Dec. 18	School Final Exam		

# Example Questions 1

- Briefly **explain** the definition of following terminologies. If they are related concept or terms, **explain** their relationship with descriptions/figure. If they are opposite concept or terms, **compare** them in terms of their strength and weakness.
  - Multi-programming vs. Time-sharing
  - Layered OS structure vs. Microkernel
  - ...



## Example Questions 2

- How many processes are created in the following program? You must plot the process tree with process ID to explain your answer. You can assume the process ID is assigned in increasing order from 0.

```
#include <stdio.h>
#include <unistd.h>
int main() {
    for (int i=0; i<3; i++){
        fork();
    }
    return 0;
}
```



# Example Questions 3-5

- Explain the process state (new, ready, running, etc.) with a diagram.
- Briefly explain why the modern general purpose OS uses paging to manage physical memory?
- What is dynamic linking, what is the purpose of using dynamic linking?
- Why dynamic linking can easily achieve its goal when running our programs in practice?



# Example Questions 6

- Consider a byte-addressable computer system with a 32-bit virtual address, total physical memory size 32 MB, page size is 4 KB, the maximum size of a segment is 16 KB. Calculate the size and the number of bits required for following fields.
  - Single-Level Segment table size (number of entries)
  - Single-Level Page table size (number of entries)
  - Max program memory
  - Physical address (number of bits)
  - ...

