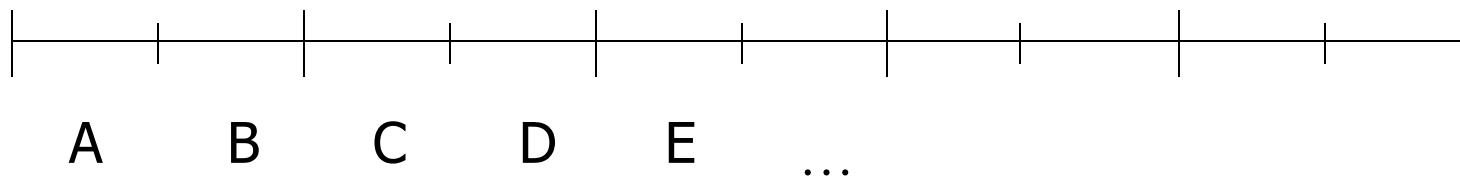


What to learn?

- Process management
 - Chapters 3 ~ 8
- Memory management
 - Chapters 9 ~ 10
- Mass-storage structure
 - Chapter 11
- File management
 - Chapter 13 ~ 15

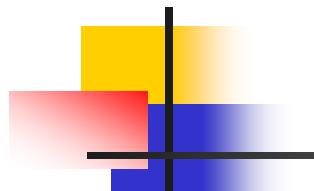
What to learn? - Process management

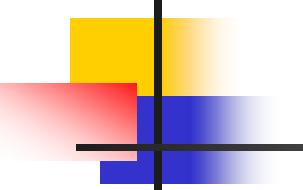
- A process concept (chapter 3)
 - We are presented with the illusion that our program is only one currently running program
 - But actually many other programs are running on the system
 - A process is an instance of program in execution



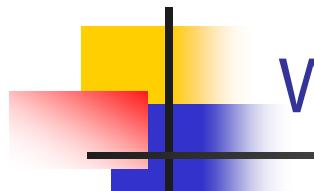
CPU is too fast, so we cannot notice the switch



- 
- Threads and concurrency (Chapter 4)
 - Context switch
 - Preempts the current process and transfers control to the new process
 - Much **overhead** is required to maintain processes
 - Context switch overhead, etc.
 - Therefore, the concept of multithreading has been introduced
 - Scheduling (Chapter 5)
 - CPU Scheduling
 - A scheduler selects which process will run in the next

- 
- Synchronization (Chapter 6, Chapter 7)
 - There are many processes !
 - Some processes may affect or be affected by other processes in execution
 - The operating system must coordinate the processes to produce right results
 - Deadlock (Chapter 8)
 - If process coordination fails, then no process may be executed in some cases;
 - One of these cases includes a deadlock situation.





What to learn? - Memory management

- All instructions needs to be in memory in order to be executed
- Sum of address spaces of multiple processes can exceed physical memory

Virtual Address Space

$$V = \{0, 1, \dots, N-1\}$$

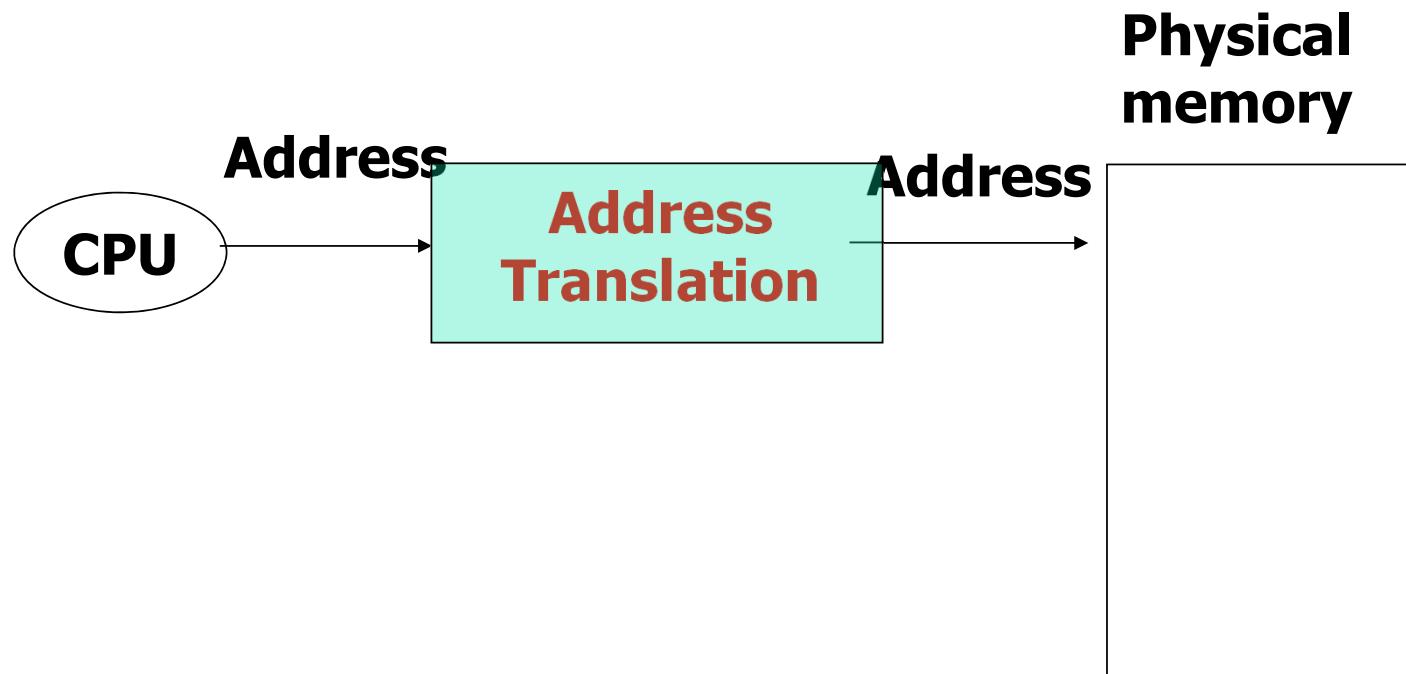
Physical Address Space

$$P = \{0, 1, \dots, M-1\}$$

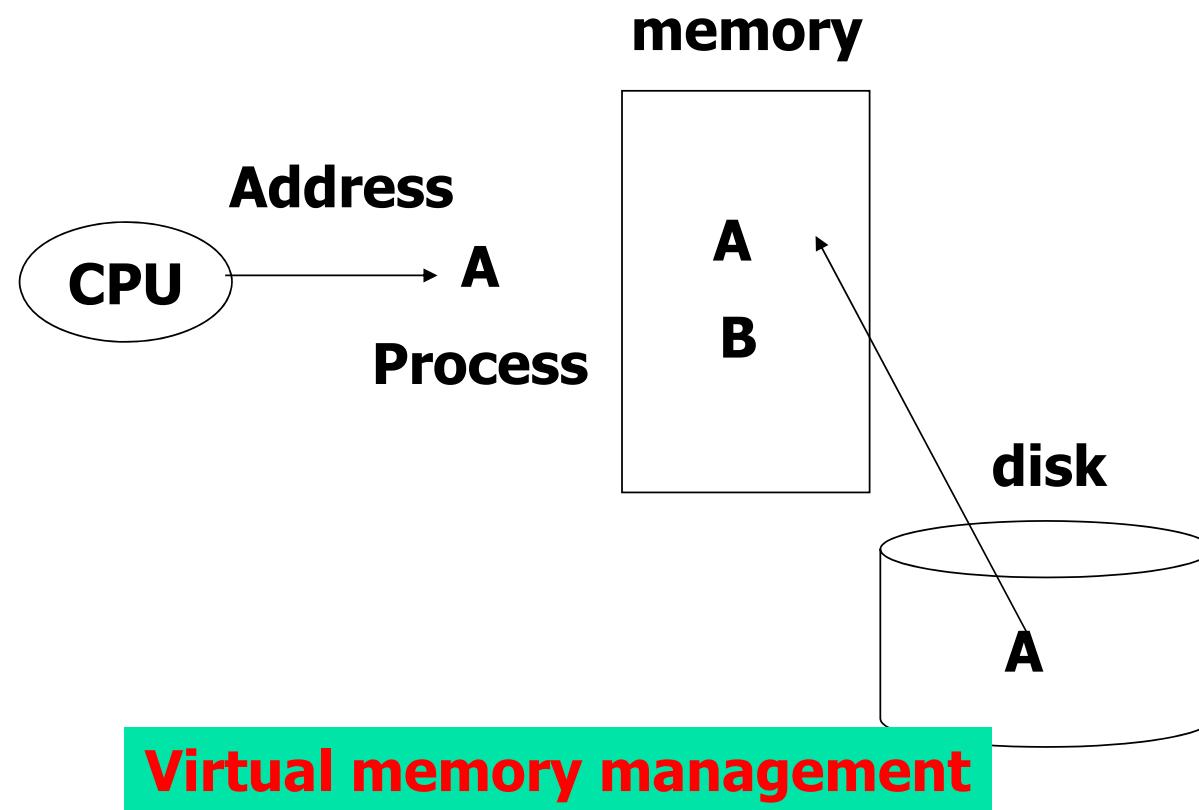
$$M < N$$

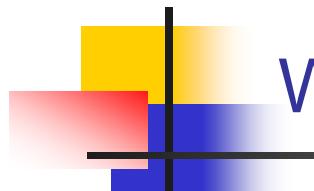


- Memory management activities (Chapter 9)



- Memory management activities (Chapter 10)

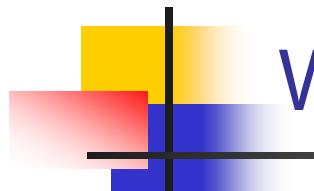




What to learn? - Mass storage structure

- Usually disks used to store data that does not fit in main memory or data that must be kept for a “long” period of time.
- Proper management is of central importance
- Entire speed of computer operation hinges on disk subsystem and its algorithms
- Disk management (Chapters 11)
 - Free-space management
 - Storage structure
 - HDD scheduling, NVM scheduling

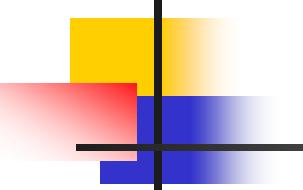




What to learn?

- file management

- OS provides uniform, logical view of information storage
 - Abstracts physical properties to logical storage unit - **file**
- File-System management (Chapters 13 ~15)
 - Files usually organized into directories
 - OS activities include
 - Creating and deleting files and directories
 - Primitives to manipulate files and directories
 - Mapping files onto secondary storage
 - Backup files onto stable (non-volatile) storage media



■ Summary

- System structure
 - Chapter 2
- Process management
 - Chapters 3 ~ 8
- Memory management
 - Chapters 9 ~ 10
- Secondary-Storage management
 - Chapter 11
- File management
 - Chapter 13 ~15