

1. Mutual exclusion: If a process P executes in its critical section, no other process can execute in its critical section.

Progress: If no process are executing in their critical sections, and some process wish to enter, then only those processes that are not executing can participate in determining the next entry into a critical section, and can not be postponed indefinitely.

Bounded waiting: After a process requests access to its critical section, there is one or more limits on the number of items other processes are allowed to enter its critical section before request is granted.

2. There is a database is shared between several concurrent process, some of these processes only want to read, while others want to write, we can these only read process reader and these only write as writer. If two reader access database there is no harm, but if writer and other processes access the database at the same time, it can cause confusion.

Example: If several people can access a file, some people just read, but if others write more information, the current information prepared by the reader may become outdated.

## Page 2 : Chapter 8.

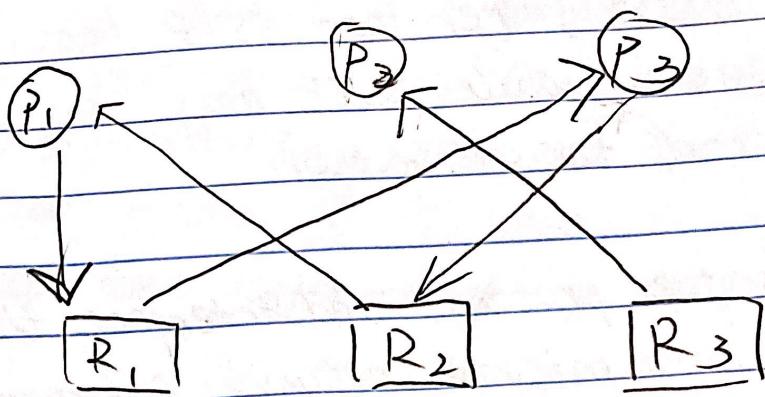
3. (i) the "needs resources" must be calculated .(the current allocation and maximum demand must to be calculated)

	R <sub>1</sub>	R <sub>2</sub>	need R <sub>3</sub>
P <sub>1</sub>	2	7	1
P <sub>2</sub>	0	3	2
P <sub>3</sub>	1	5	3

(ii) Enter P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub> can go , they are safe .

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4.



page 4: chapter 11, 13, 14, 15

5. Scan may be fairer than SSTF, because it will scan all request, while SSTF may stay in a narrow area and lead to starvation
6. VFS is the protocol and interface that defines how different systems communicate network information, where NFS is more relevant to a particular system on a local device  
How they Use: NFS on a given system can support VFS operations between other system.  
VFS can provide a standard file interface for application layer

## page 5 : Chapter 12

- 7.
- a. For example, there's new information updated, then now polling might be superior to interrupting, during the polling the CPU periodically sends out queries, asking each peripheral in turn if it needs its services, which enhanced the real-time performance of the program.
  - b. For example: There's an I/O operation, then interrupting might be superior to polling because interrupting supports parallel operation of multiple programs and I/O devices, improve efficiency

- 8.(a) Physical : The site containing the computer system must be physically secured against armed or surreptitious entry by intruders
- (b) Human Authorization : careful human authorization must be taken to ensure that only the right users can access the system, Users can also be tricked into providing access
- (c) Operating System : Operating System must protect itself from accidental or purposeful security breaches.
- (d) Networks : Networks that intercept data can leak private information , Data interception may constitute a remote denial of service attack

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- 9.(a) There is only one door, customers have to go through cashier to get out.
- (b) first layer is cashier observation  
second layer is cameras  
third layer is the label that triggers the alarm

10. The principle of least privilege is one of the most basic principle in system security, it refers to the least privilege necessary for each subject in network to ensure the least loss caused by possible accidents, errors, tampering of network components, least Privilege refers to the privilege that is essential for every subject like user or process on the network to perform an operation
11. The security regard to an automobile is automobile door lock, if you don't want any other people get into your car, then you can lock your car door, This is security, The protection regard to airbags on car, if you are involved in an accident, the airbag will protect you from injury or mitigate the injury. this is protection security include protection.

## page 9 : Ethics / Legal Circumstance .

12. Our company came up with cost-cutting techniques that no other company had, so one member of the team made a profit by selling secrets of our manufacturing method to other ventilator companies.

In doing so, he violated the confidentiality of the company, steal company secrets and leak it to others.