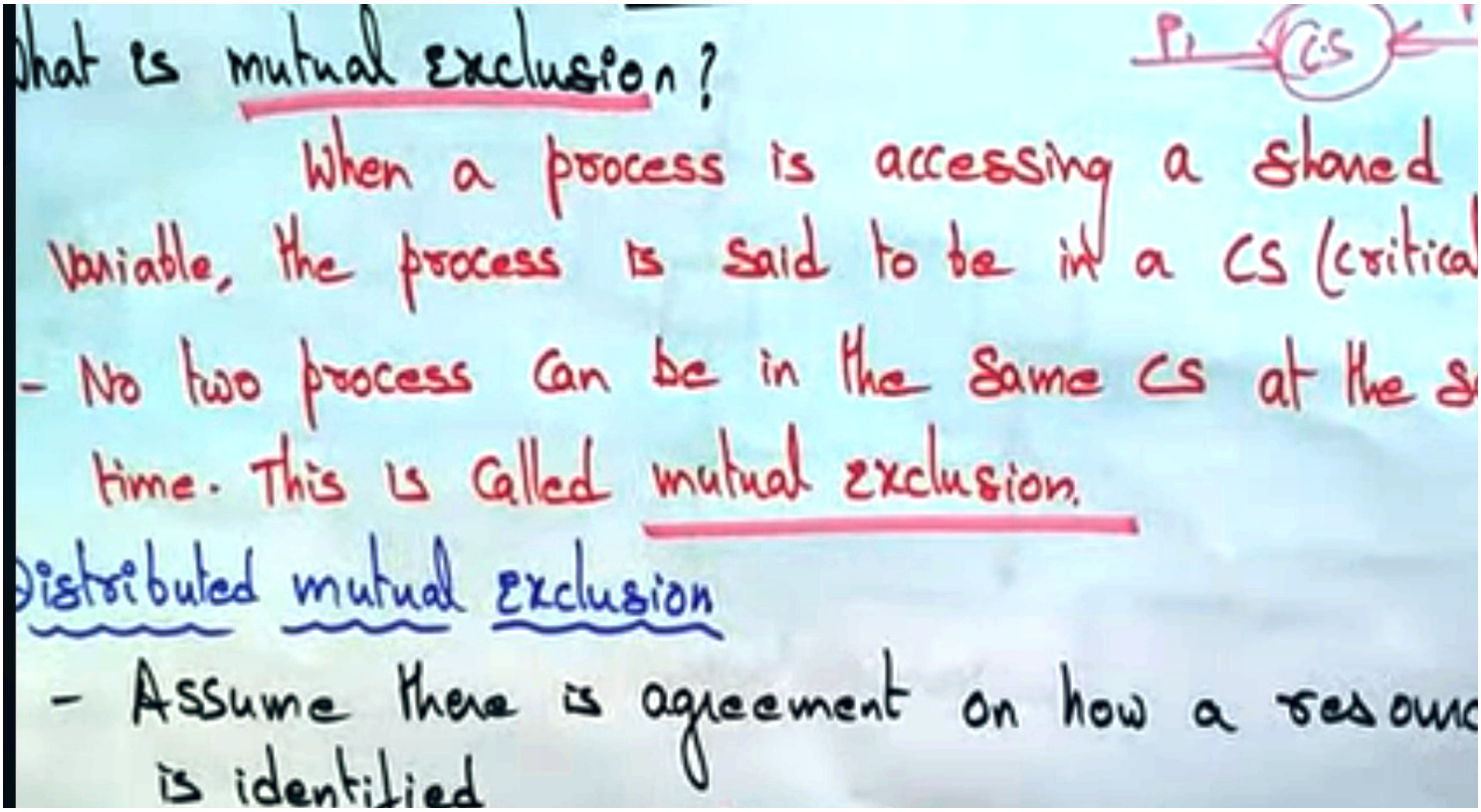
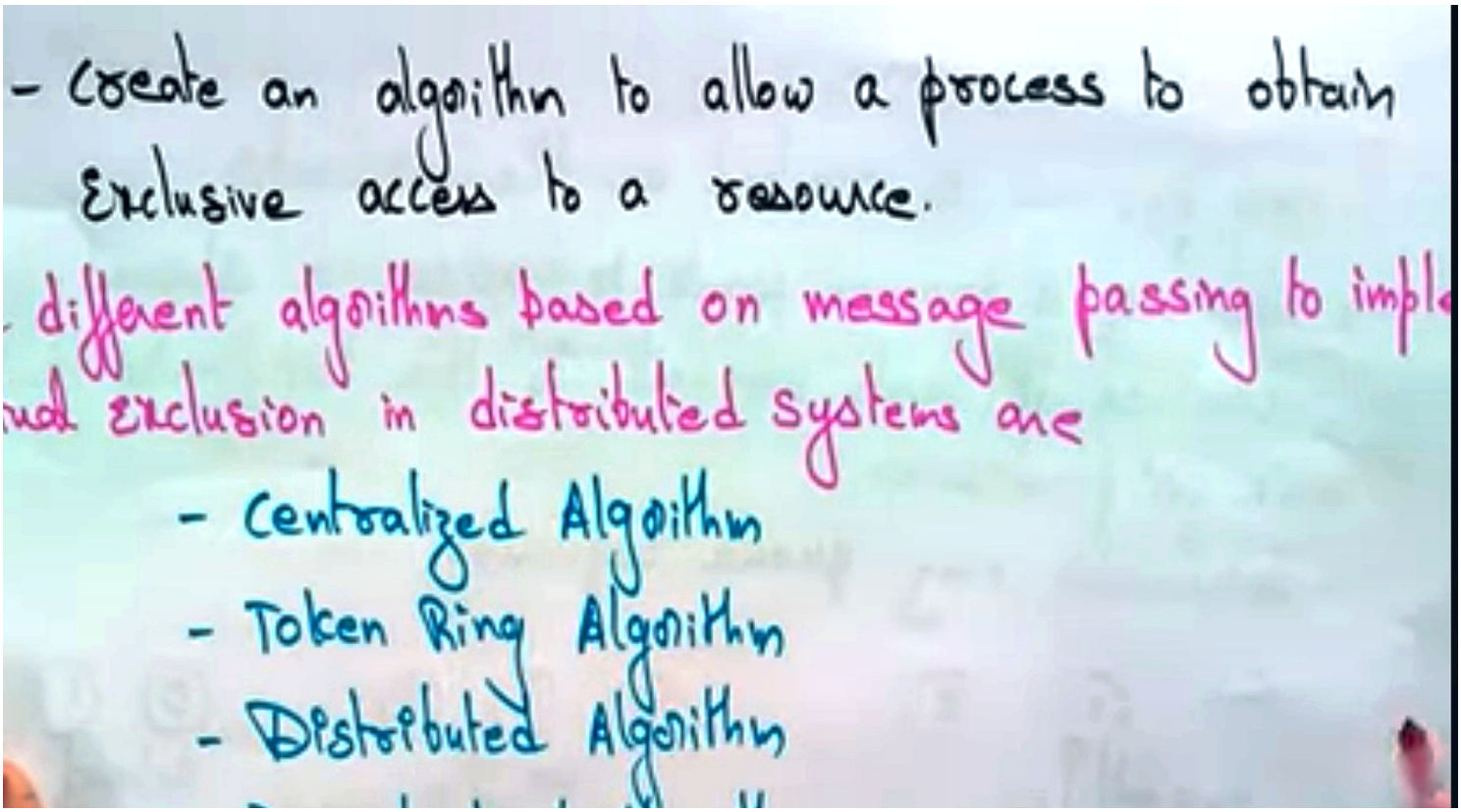

What is mutual exclusion?
When a process is accessing a shared variable, the process is said to be in a CS (critical
- No two process can be in the same CS at the s time. This is called mutual exclusion.
Distributed mutual exclusion
- Assume there is agreement on how a resour is identified

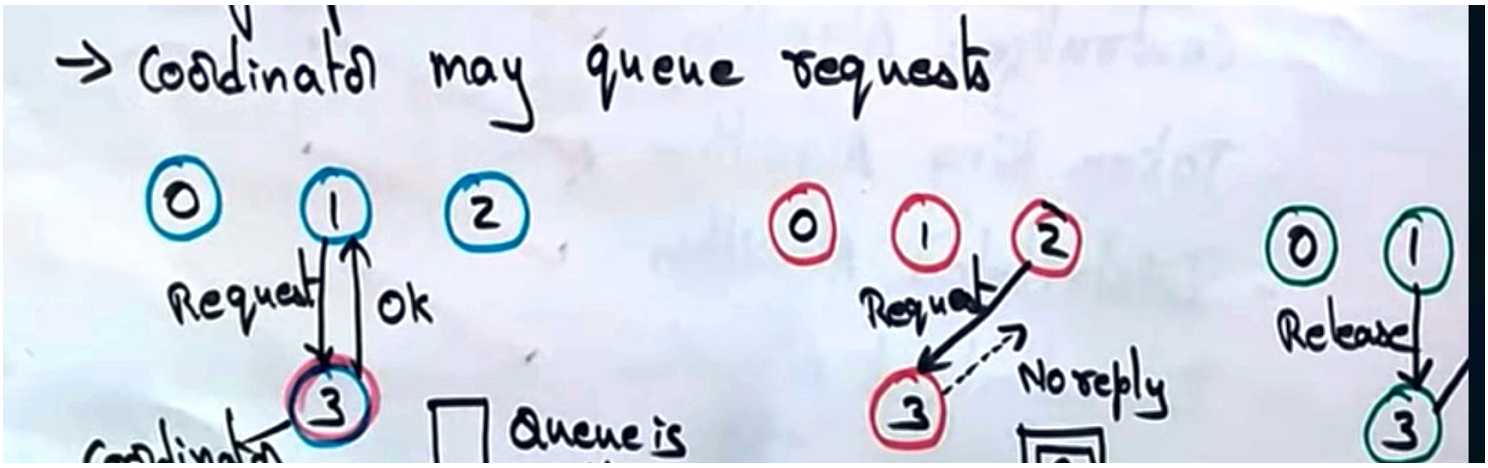

- Create an algorithm to allow a process to obtain
Exclusive access to a resource.
different algorithms based on message passing to imple
ual exclusion in distributed systems are
- Centralized Algorithm
- Token Ring Algorithm
- Distributed Algorithm

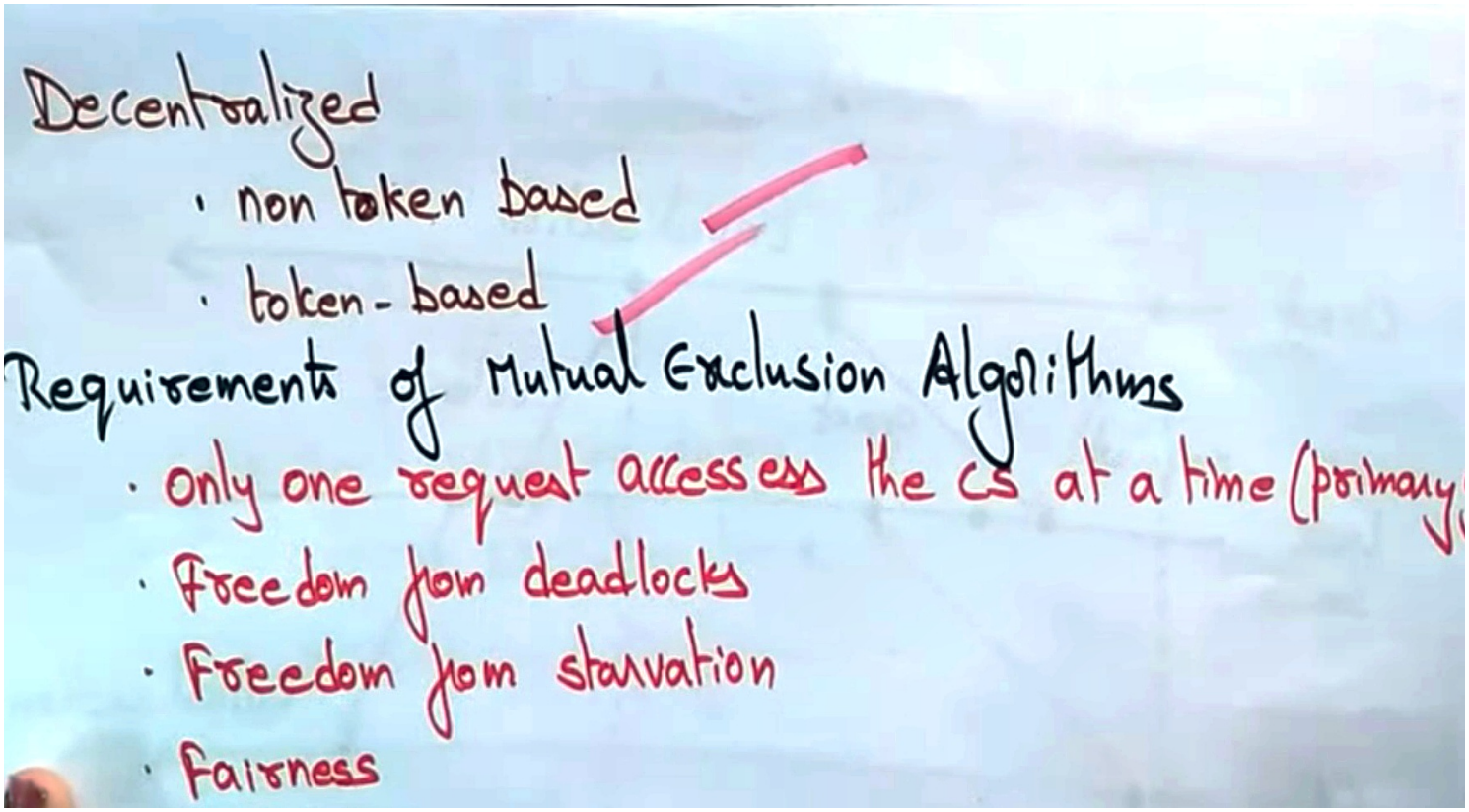
Centralized Algorithm :-

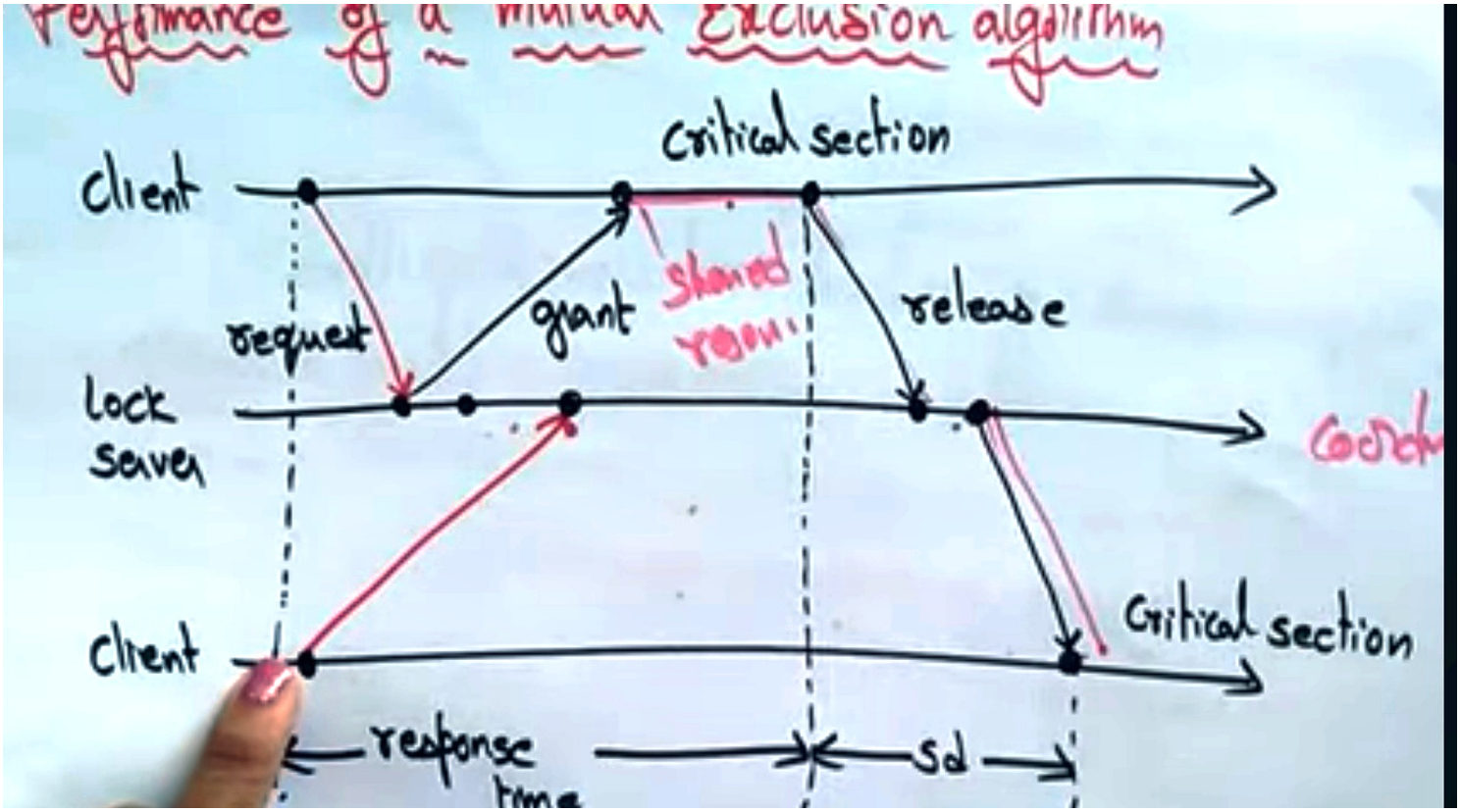
→ One process is elected as the coordinator

→ Whenever a process wants to access a shared resource, it sends request to the coordinator to ask for permission

→ Coordinator may queue requests


→ Coordinator may queue requests
0
1
2
Request
Ok
3
Queue is
0
1
2
Request
No reply
3
0
1
Release
3


Decentralized
· non token based
· token-based
Requirements of Mutual Exclusion Algorithms
· Only one request accesses the CS at a time (primary
· Freedom from deadlocks
· Freedom from starvation
· Fairness


Performance of a Mutual Exclusion algorithm
Critical section
Client
request
grant
Shared resource
release
Lock server
Client
Critical section
response time
sd

System Throughput S (rate at which the system exec
requests for the CS)

$$S = \frac{1}{Sd + E}$$

Sd = Synchronization delay

E = average execution time

- low load & high load performance
- best & worst case performance; if fluctuates statistica