

The critical section problem with N threads Baker Algorithm

Baker Algorithm = Intended to improve the safety in the usage of shared resources among multiple threads by means of mutual exclusion.

Advantage : Mutual exclusion, starvation, deadlock.
Disadvantage : Tickets increases infinitely.
even we don't want to use the critical section part, we have to ask all.

overall algorithm too inefficient to use in practice

Interrupt

= An Interrupt is a signal to the processor emitted by hardware or software indicating an event that needs immediate action.

Test & set (Hard ware)

= test and set instruction is an instruction used to write 1 to a memory location and return its old value as a single atom.

can be implemented number of lock variables
busy-wait problem, starvation problem, deadlock problem

Swap Swapping (Hard ware)

= The act of swapping two variables refers to mutually exchanging the value of the variables.

* could lead to starvation.

Semaphores

= Semaphore is a variable used to control access to a common resource by multiple processes in a concurrent system.

Busy wait, Blocked & set

* Programmer do not need to use a low-level machine language.

easy to use.

Spin lock

= spin lock is a lock which causes a thread trying to acquire it to simply wait in a loop while repeatedly checking if the lock is available.

Busy wait semaphore

= An integer variable V ;

Blocked set semaphore

= An integer variable V , A set of processes (array)

Semaphore Satisfy

= Mutual exclusion & deadlock.

but not starvation.

대리점의 물건 재고에 따라 판매가 달라짐

판매 개수를 알면 남은 재고의 wait(s)

이 재고의 부족함 = starvation.

대리점은 semaphore의 First in First out Queue.

test & set pseudo code

= await (!testAndSet(lock))

Critical section

lock = false;

1) lock variable = true (fix \rightarrow true)

2) true \rightarrow false.

swap pseudo code

= key = true

while (key = true) swap(lock, key);

Critical section

lock = false;