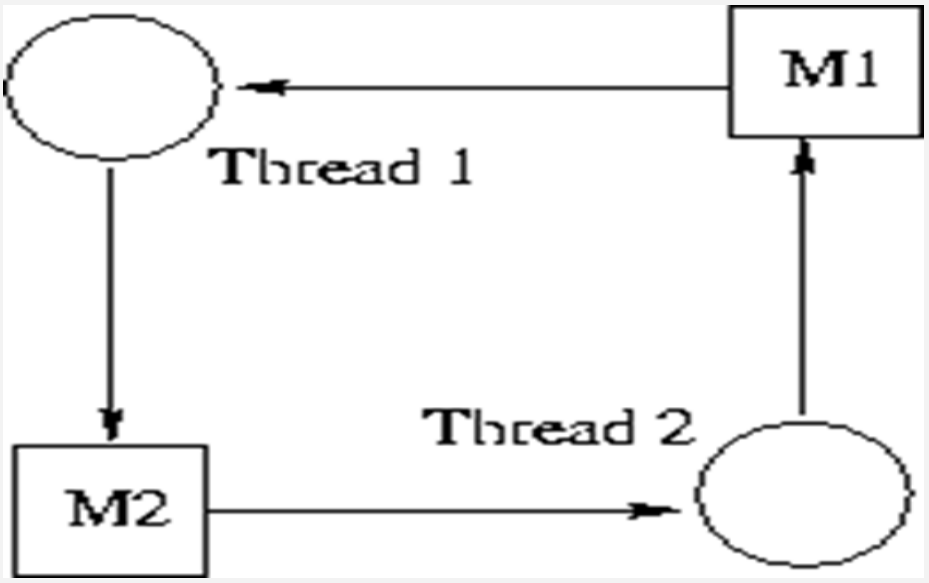
Conditions for Deadlock

Mutual Exclusion

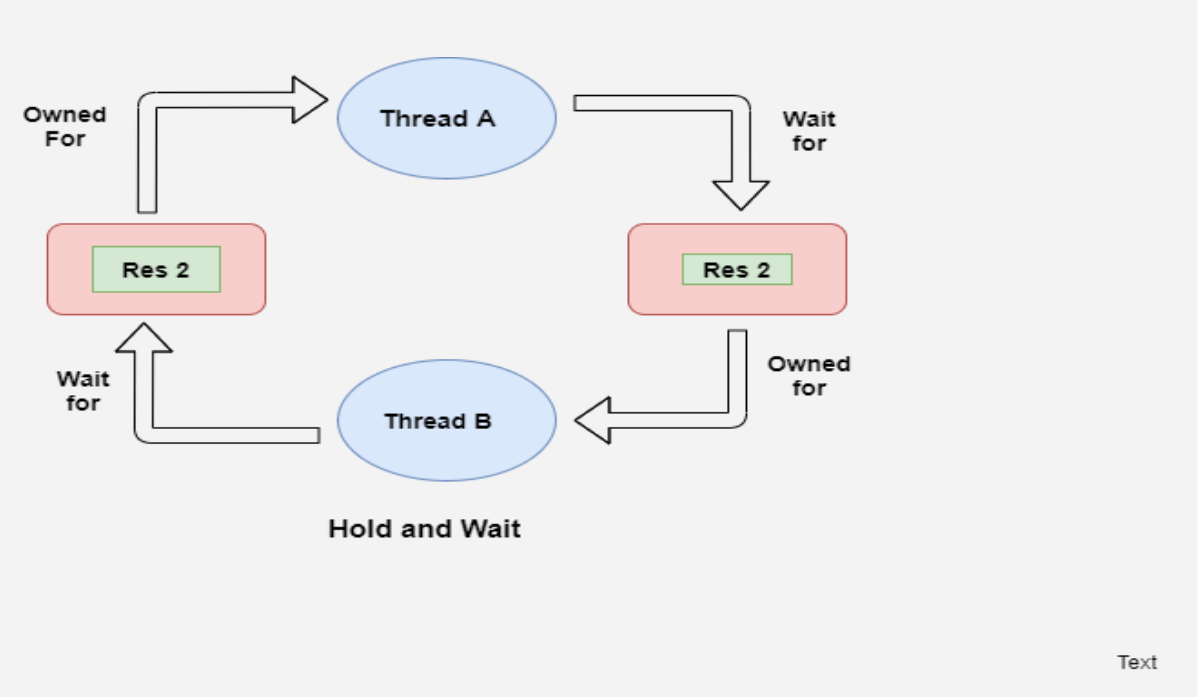
- The resources involved must be unshareable.
- Every resource is either currently allocated to exactly one process or it is available. (Two processes cannot simultaneously control the same resource).



Mutual Exclusion

Hold and Wait

There must exist a process that is holding at least one resource and is waiting to acquire additional resources that are currently being held by other processes.

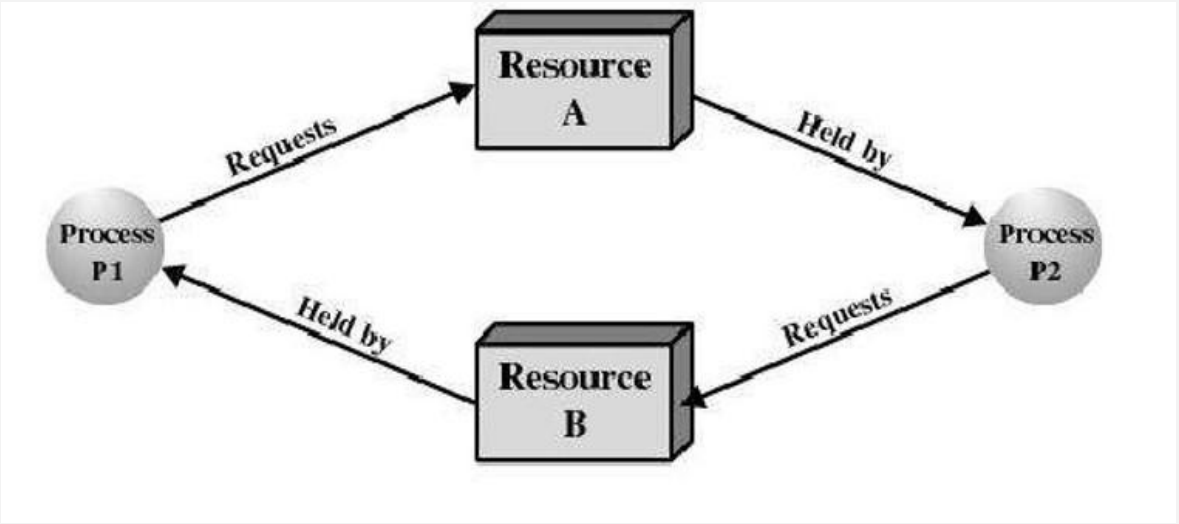


No Preemption Condition

If a process that is holding some resources requests another resource that cannot be immediately allocated to it, then all resources currently being held are released implicitly. Then the preempted resources are added to the list of resources for which the process is waiting.

Circular Wait

In circular wait a chain of processes exists in which each process waits for one or more resources held by the next process in the chain.



Circular Wait