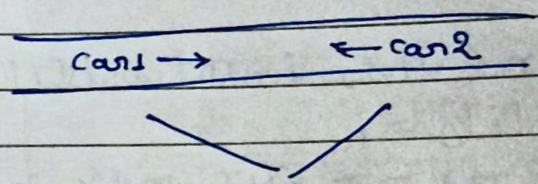
# Deadlock (OPERATING SYSTEM)

**What is ??**

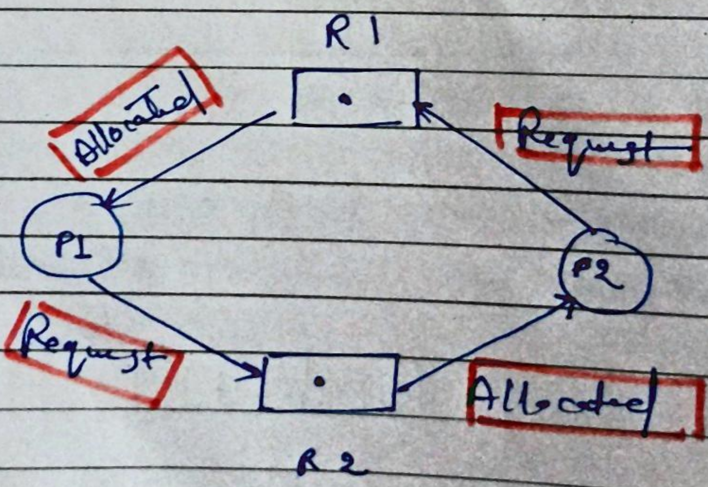
If two and more processes are waiting on happening of some event, but that event does not happen, that is deadlock

example :




both are stuck
no one can pass and waiting for some event
so that is deadlock situation.

example :



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## Condition of deadlock

**mutual exclusion**

means

the resource you are using in the scenario that must be used in mutual exclusive way. That means more than one processes cannot used the same ~~pr~~ resource.

**No preemption**

means like P1 is using R1, R1 is allocated to P1 and P1 need R2 and P2 need R1 so preemption not there.

Preemption also not occur.

**Hold & wait**

P1 is holding resourse that is R1 and waiting for R2

And P2 is holding one resource (R2) and waiting for R1 that is hold and wait.

**Circular wait**

if their is loop then condition of deadlock arise.

## Deadlock handling methods

→ (i) Deadlock ignorance (Ostrich method)
→ (ii) Deadlock prevention
→ (iii) Deadlock avoidance (Banker's algo)
→ (iv) Deadlock detection and recovery

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# Paging (OPERATING SYSTEM)

In Paging we split a process into equally sized pages and insert it into the frames of main memory.

→ process size = 4 B
Page size = 2 B
No. of Pages = $\frac{4B}{2B}$ = 2

Note: Frame size and page size should be same.

M/M size = 16 B
frame size = 2 B
No. of frame = $\frac{16B}{2B}$ = 8 frames

What is frame ??

→ Physical Address space is conceptually divided into number of fixed

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size blocks called frames.

What is pages ??

↳ logical address space is splitted into fixed-size blocks called pages.

Translation of logical Address into physical address —

Some points to note:

- CPU always generates a logical address.
- In order to access the main memory always a physical address is needed.

↳ logical address generated by CPU always consists of two parts:

1. Page number (p) ⟶ used to specify the specific page of the process from which the cpu wants to read the data and also used as an index to to page table.
2. Page offset (d)

↓

used to specify word on the page that the cpu wants to read.