* Swapping | context-switching | Orphan process | Zombie process

- **Swapping**

(a) Time-Sharing system may have medium term Scheduler (MTS).

(b) Remove processes from memory to reduce degree of multi-programming.

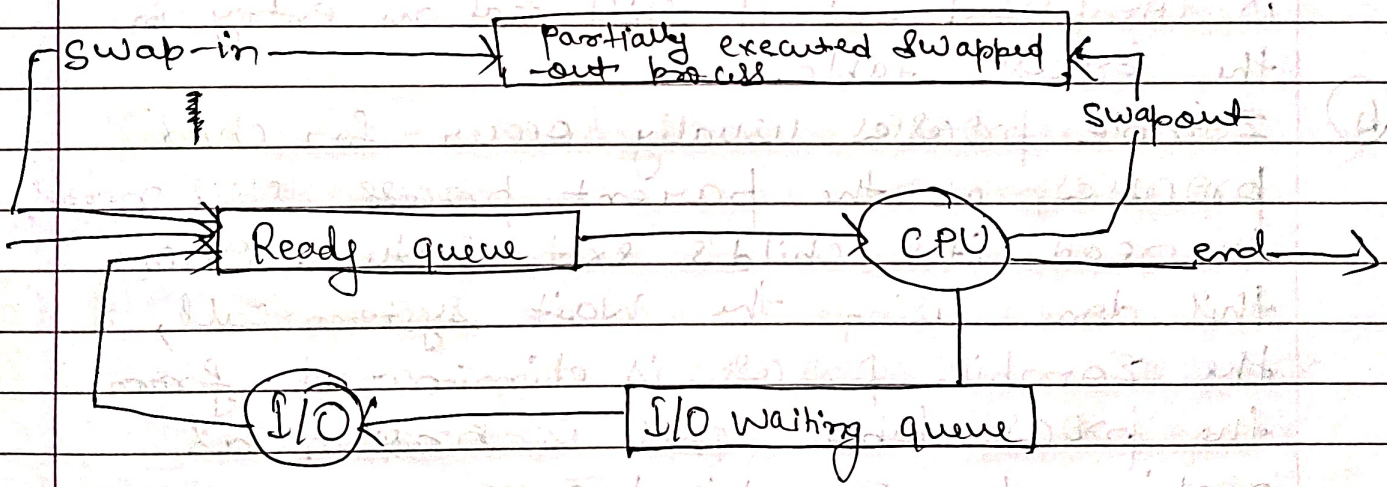
(c) These removed processes can be reintroduced into memory, and its execution can be

continued where it left off. This is called swapping.

(d) Swap-out and swap-in done by MTS.

(e) Swapping is necessary to improve process mix or because a change in memory requirements has overcommitted available memory, requiring memory to be freed up.

(f) **Swapping** :- It is a mechanism in which a process can be swapped temporarily out of main memory (or move) to secondary storage (disk) and make that memory available to other processes. At some later time, the system swaps back the process from the secondary storage to main memory.



- **Context-switching**

(a) Switching the CPU to another process requires performing a state save of the current process and a state restore of a different process.

(b) When this occurs, the kernel saves the context of the old process in its PCB and loads the saved context of the new process scheduled to run.

(c) It is pure overhead, because the system does not useful work while switching.
(d) Speed varies from machine to machine, depending on the memory speed, the no. of registers that must be copied etc.

Orphan process

(a) The process whose parent has been terminated and it is still running.
(b) Orphan processes are adopted by init process.
(c) Init is the first process of OS.

Zombie process / Defunt process

(a) A zombie process is a process whose execution is completed but it still has an entry in the process table.
(b) Zombie processes usually occur for child processes, as the parent process still needs to read it's child's exit status. Once this done using the wait system call, the zombie process is eliminated from the process table. This is known as reaping the zombie process.
(c) It is because parent process may call wait() on child process for a longer time duration and child process got terminated much earlier.
(d) As entry in the process table can only be removed after the parent process reads the exit status of child process. Hence, the child process remains a zombie till it is removed from the process table.