# OPERATING SYSTEM

## Processor Scheduling

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Scheduling is a fundamental operating system function. All computer resources are scheduled before use. Since, CPU is one of the primary source its scheduling is central operating system design.

Scheduling refers to a set of policy and mechanism supported by operating system that control the order in which the work to be done  is completed.

Scheduling is an operating system program module that select the next job to be admitted for execution.

The main objective scheduling is to be increase CPU utilization and throughput. (To keep CPU busy as possible is called CPU utilization) and number of procedures that complete per unit time is called throughput.

CPU scheduling is the basic of operating system which support multiprogramming concept. By having number of program in computer memory at same time, the CPU improve the overall efficiency of the computer system by getting more work done in less time. There are three types of scheduler :

1. Long term scheduler
2. Medium term scheduler
3. Short term scheduler

# Long term scheduler

Some time it is also called as job scheduling. This determine which job shall be admitted for immediate processing. There are always more processes that it can be executed by CPU operating system. Those processes are kept in large storage device like disc for later processing.

The long term scheduler selects processes from this pool and loads them into memory. In memory this process belongs to ready queue. Queue is type of data structure long term scheduling is heavily influenced by resources allocation consideration especially memory management.

It may also be important that long term scheduler should take careful selection of processes i.e. processes should be combination of CPU bound process or output bound processes.

If all processes are output bound the ready queue will always be empty.

If all processes are CPU bound then no process will be waiting for output operation and again system will be unbalance. Therefore, long term scheduler provides good performance by selecting combination of CPU bound and input bound.
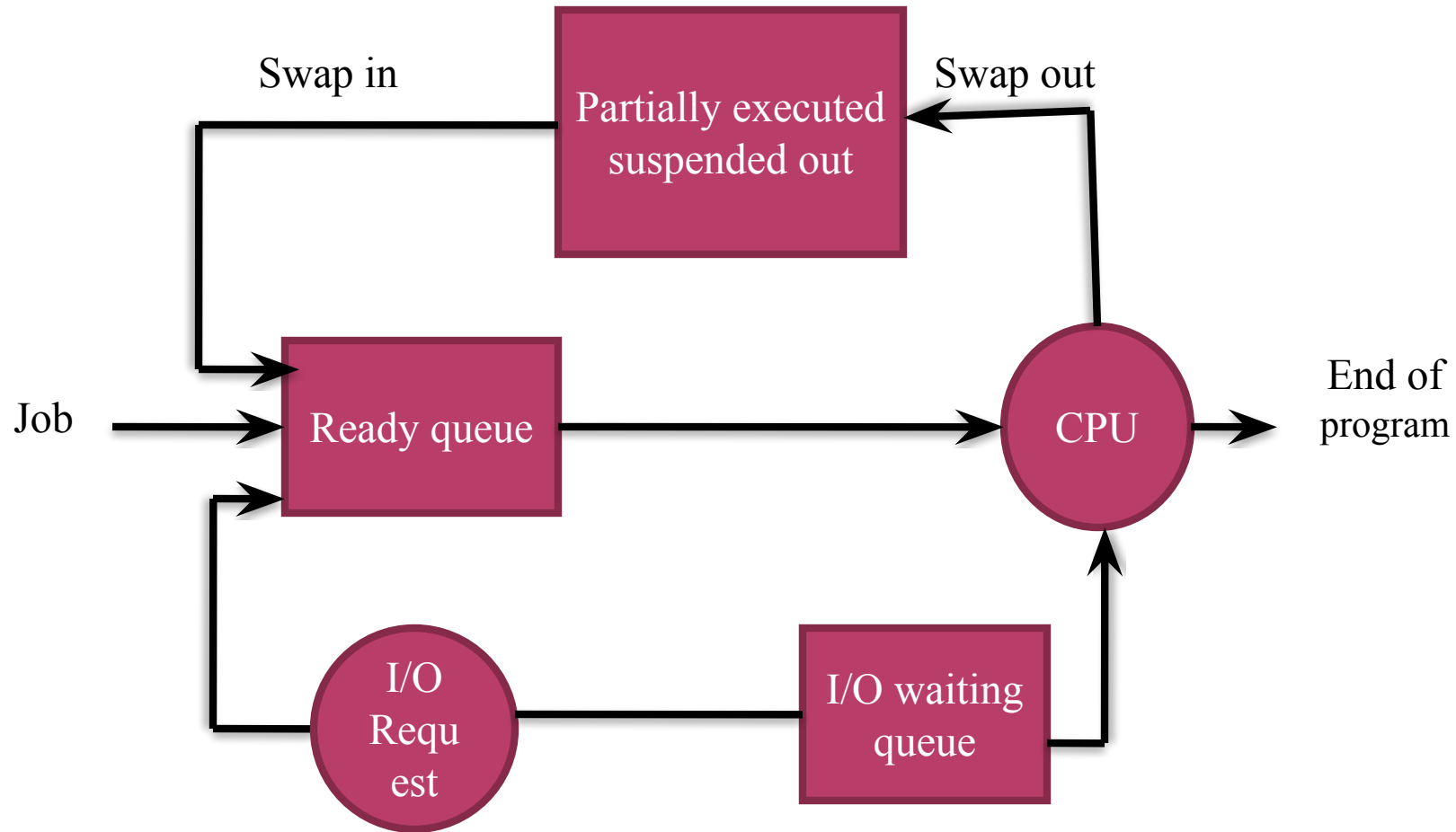
# Long term & Short term scheduler
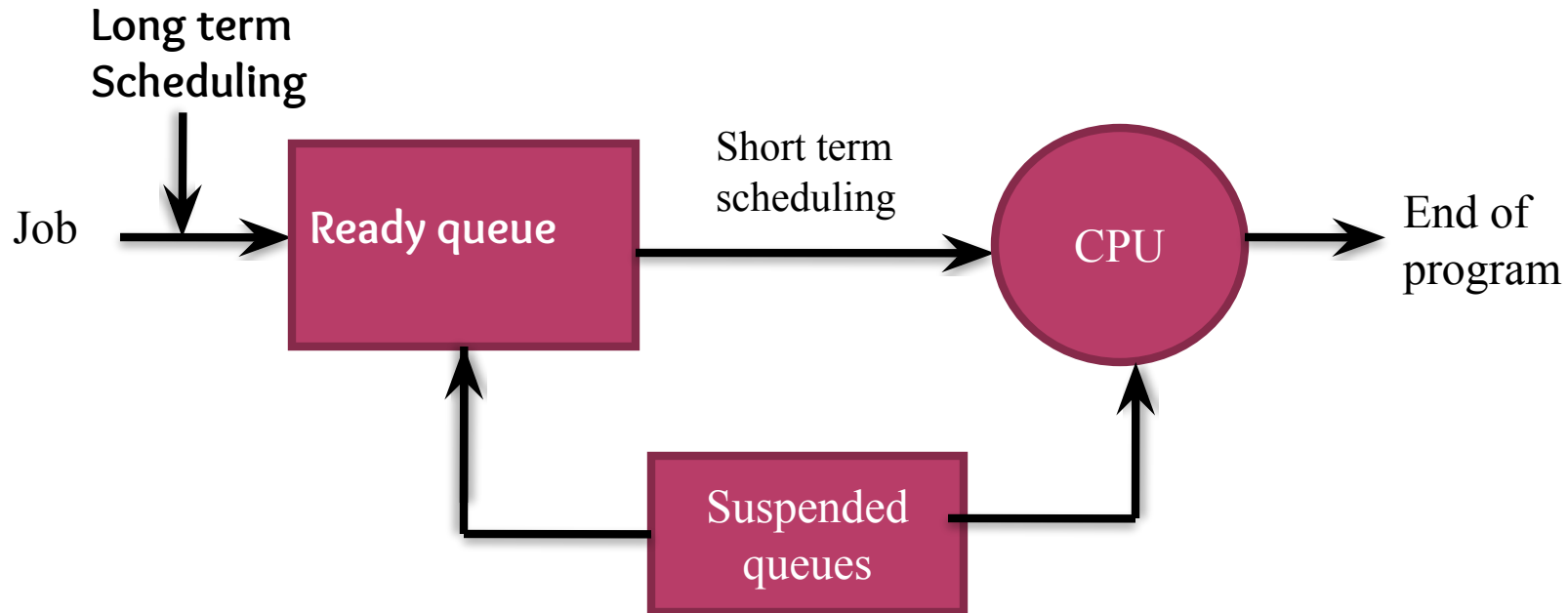
# Medium term scheduler

Most of the processes request same input operations . In that case, it may become suspended for input operations after running a while. It is beneficial to remove the processes from main memory to hard disc to make a room for other processes at same later time. This process can be reloaded into memory and continued where from it was left earlier saving of the suspended process said to be swapped out.

# Medium term scheduling

# Short term scheduler

It allocates processes belonging to ready queue to CPU for immediate processing. It main objective is to maximize CPU requirement. Compare to other two scheduler it is more frequent . It must a select a new process for execution quite often because CPU execution a process only for few milliseconds before it goes for output operations.

# Scheduling Criteria

1. **CPU Utilization**: To keep CPU as busy as possible.

2. **Throughput:** Number of processes that complete in per unit time.

3. **Turn around time:** The interval from the time of submission of process to the time of complete is called as turn around time.

4. **Waiting time:** Some of the periods send waiting in the ready queue. i.e. waiting time=turn around time - processing time

5. **Response time:** The time from the submission of request until the first response is produced this measure is called as response time.

# Difference between Preemptive and Non-preemptive

- The system can remove the process or from process it is running.

- Once the system has assigned a processor to a process the system cant remove that process or from that process

- The processor may execute a portion of processes code and perform context switch in for over headed.

- Each process only gives a processor run to completion or until it voluntarily relinquishes its processor.

# Scheduling Algorithm

- First in first out (FIFO)

- Round Robin

# First in first out

It is said to be as first come first out. Server processes are dispatched according to their arrival time at the ready queue. FIFO is a non-preemptive algorithm, means once the process has a processor it runs to completion. FIFO is a fair means that it schedule a processes according to their arrival time to all processes are treated equally. FIFO is not interactive process because it can't guarantee for short response time.

# Fig. FIFO Scheduling

Ready queue

P3   P2   P1 → Processor → completion
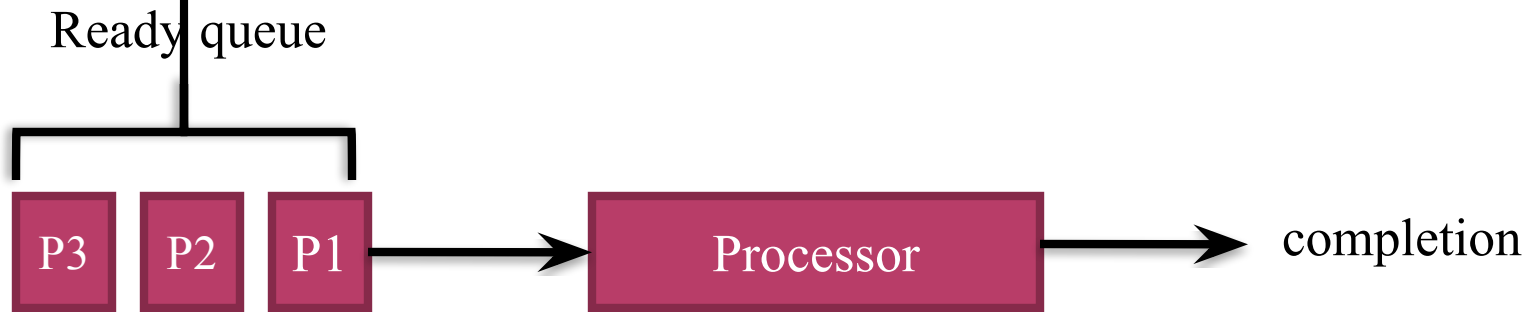
# Round Robin Scheduling

In round robin scheduling processes are dispatched like in FIFO but are given a limited amount of processor time, it is called as time slice or quantum

If process does not complete before its quantum expires the system preempts it and gives processor to the next waiting process. The system at the ready queue is called as round robin scheduling. This only scheduling adopt preemptive scheduling

# Fig. Round robin scheduling

Thank You !