

operating system

CPU Scheduler

when a pc become idle the operation select one of the processes is ready queue to execution the selection is done by CPU scheduler.

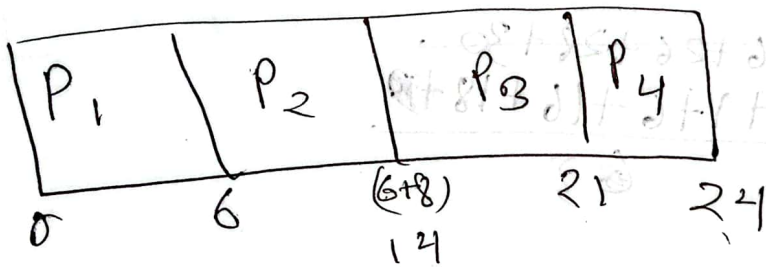
CPU Scheduling Algorithm

- i) first come first serve scheduling
- ii) shortest job first scheduling
- iii) Priority Scheduling

iv) Round robin scheduling

① ~~first~~ first come first serve

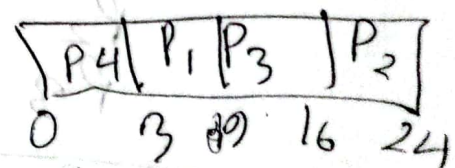
process	Burst time
P ₁	6 ms
P ₂	8
P ₃	7
P ₄	3



average =

ii) shortest job first scheduling

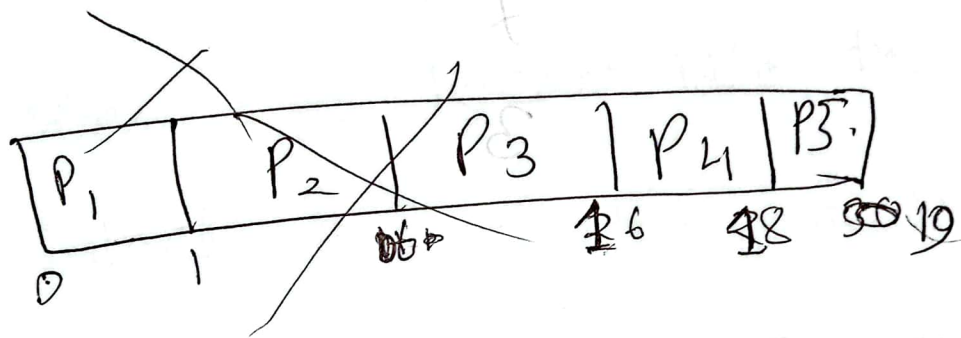
process	Burst time
P ₁	6
P ₂	8
P ₃	7
P ₄	3



average = $\frac{0+3+9+16+24}{4}$

iii) priority scheduling

process	Burst time	priority
P ₁	10	3
P ₂	1	1
P ₃	2	4
P ₄	1	5
P ₅	5	2



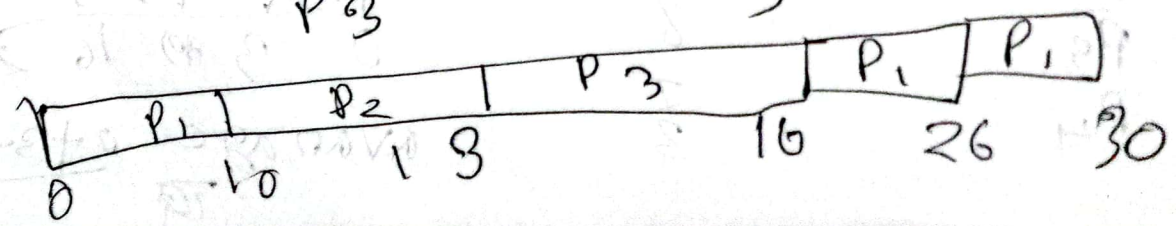
average

$$\frac{0 + 1 + 6 + 16 + 18 + 19}{6} = 10.5$$

iv) Round Robin

Q=10

process	Burst
P ₁	24
P ₂	3
P ₃	3



23.9.23 - software design and OS

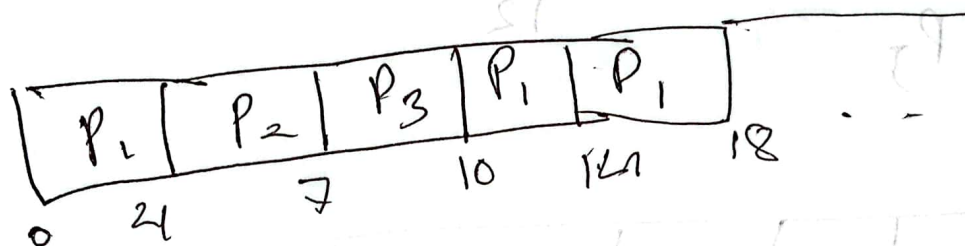
23.9.23

OS

Round Robin

<u>process</u>	<u>Burst time</u>
P ₁	24
P ₂	3
P ₃	3

$$T.O.T = 4$$



$$P_1 = 0 + (10 - 4) = 0 + 6$$

$$P_2 = 4$$

$$P_3 = 7$$

average waiting time =

Process

Burst time

P₁

10

P₂

20

P₃

3

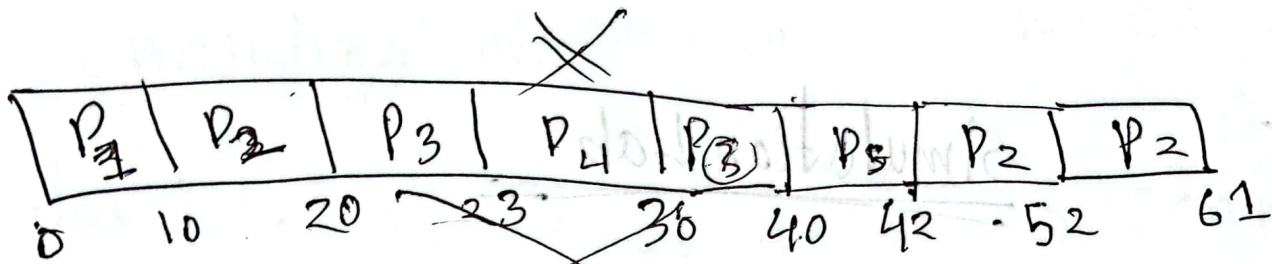
P₄

7

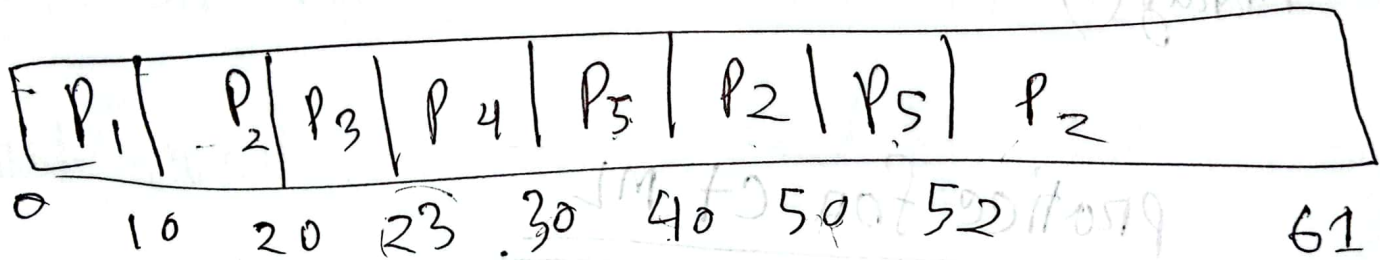
P₅

12

T.O = 10



Average waiting time = $\frac{10 + 42 + 23 + 30 + 32}{5}$



Ans
P₁ = 0

P₂ = 10 + (40 - 20) + (52 - 50)
= 32

P₃ = 20

P₄ = 23

P₅ = 30 + (50 - 40)
= 40

A.W.T = $\frac{0 + 32 + 20 + 23 + 40}{5}$
= 23

24.09.24

OS

Shortest Job First

Preemptive SJF: preemptive SJF is a type of scheduling algorithm in which job inserted into the ready queue as soon as they arrive at the disk. The process having the shortest burst time start to get execution first event if the shortest burst time start to get execution first event, if the shortest burst time arrives the current burst time to remove from the execution process shortest job first (SJF)

Process

Arrival time

Burst time

P₁

0

8

P₂

1

4

P₃

2

9

P₄

3

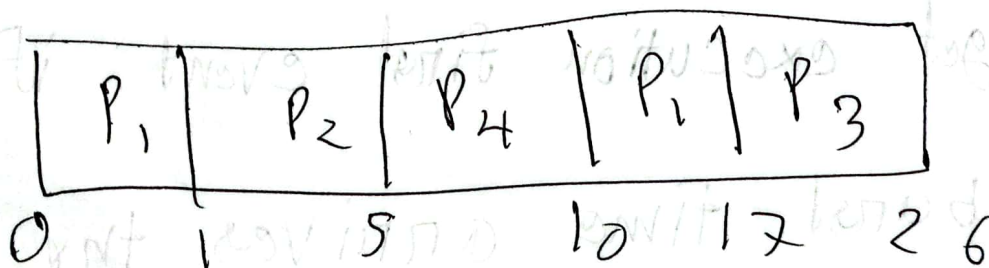
5

Completion time: time at which process complete its execution

Turn around time = completion time - arrival time

waiting time = Turn around time - Burst time

preemptive SJF



waiting time

$$P_1 = (10 - 1) = 9$$

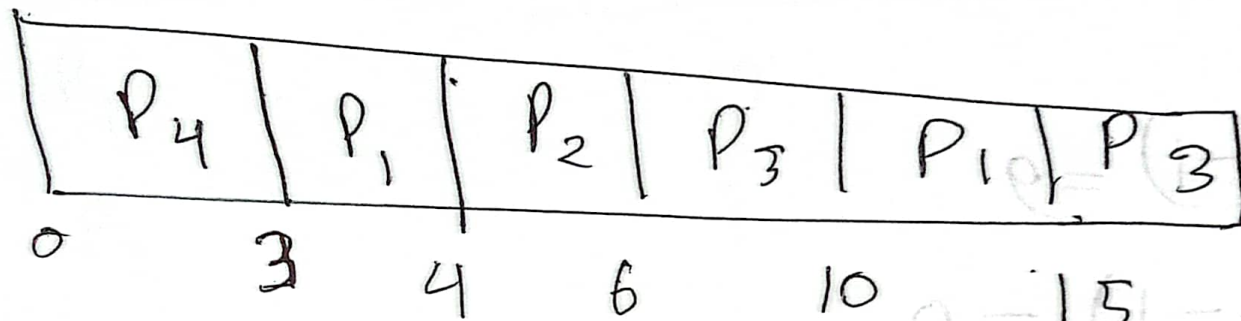
$$P_2 = (1 - 1) = 0$$

$$P_4 = 5 - 3 = 2$$

$$P_3 = 17 - 2 = 15$$

Ex

<u>process</u>	<u>Arrival time</u>	<u>Burst time</u>
P_1	2	6
P_2	5	2
P_3	1	8
P_4	0	3
P_5	4	4



0 - 15 - 23

30.09.2024

DP Theory

⇒ what is process control block and their work

Chapter-3

state figure with right arrow

→ process state

→ process control block — definition
কোন block এ কী থাকে
আর কী কাজ করে

SJF — preemptive
non-preemptive

কী ভাবে কাজ করে

P	0	8	6.5
P ₂	1	4	32
P ₃	2	9	
P ₄	3	5	

C.T	TAT	WT
9	7	1
11	6	4
23	22	16
3	3	0
15	11	7

process	Arrival time	Burst time
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$\times P_1$	2	6 ✓
--------------	---	-----

$\times P_2$	5	2 ✓
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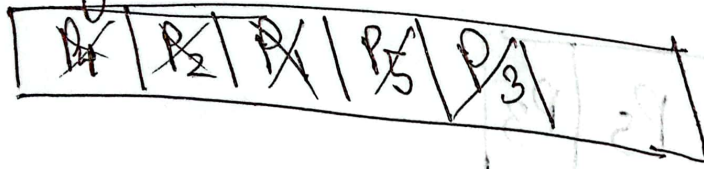
P_3	1	8
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$\times P_4$	0	3 ✓
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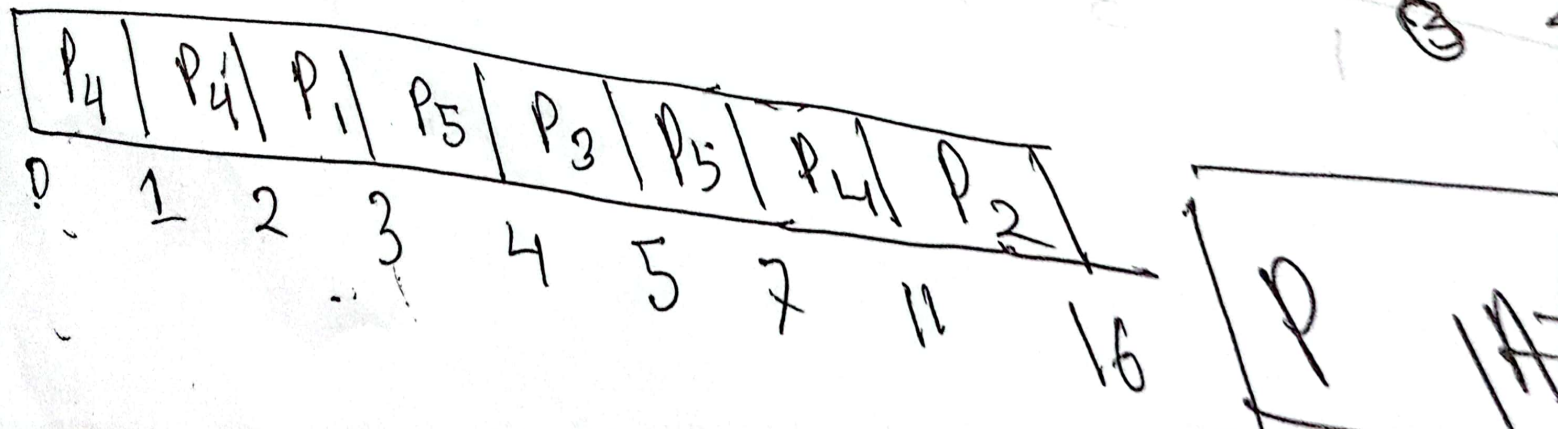
P_5	4	4 ✓
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<u>Process</u>	<u>Arrival time</u>	<u>Burst time</u>	<u>CT</u>	<u>TAT</u>	<u>WT</u>	<u>RT</u>
$\times P_1$	2	1	3	1	0	0
P_2	1	5	16	15	10	10
$\times P_3$	4	1	5	1	0	0
P_4	0	4	11	11	5	2
$\times P_5$	2	2	7	7	5	2

Ready Queue



Gantt chart



OS Theory

Multilevel Queue Scheduling

Dual Mode operation

User process:

user process execution

call system call

return from system call

trap mode bit = 0

return mode bit = 1

kernel

executing system call

(PC)

(user)

bit = 0

boot

bit = 1

10.09.2024

operating system

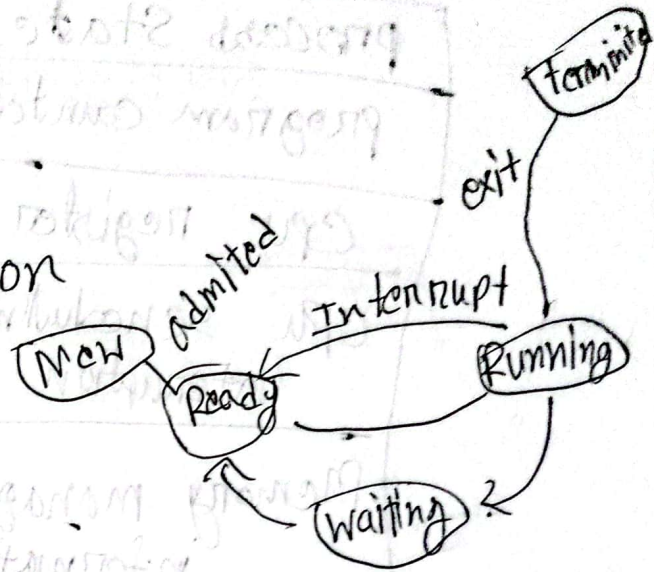
process control Block

Program \rightarrow set of instruction

||
process (1/c event)

Active phase

* New \rightarrow when a process is created



Running: instruction are being executing

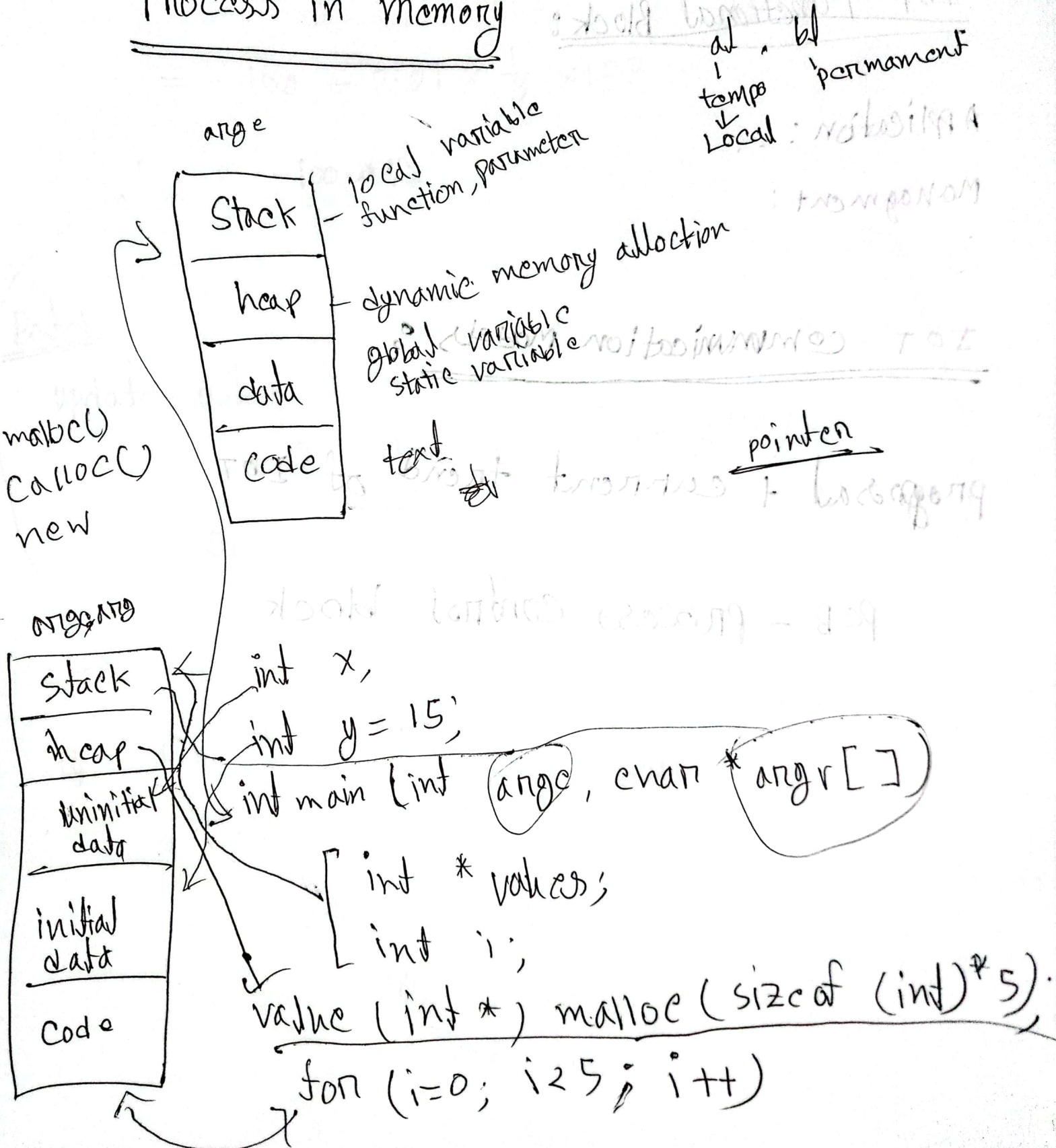
waiting: process is waiting for some event to occur.

terminated: when the process is finished

Ready: The process is waiting to to assign to processor.

Operating System

Process in memory



scheduling

Scheduling is the action of assigning resources to perform task. the resource may be process, network link, the task may be thread, processes or data flows the scheduling activity is carried out by a process called scheduler.

(কোনো process বা under a thread বা execution বা scheduling বা)

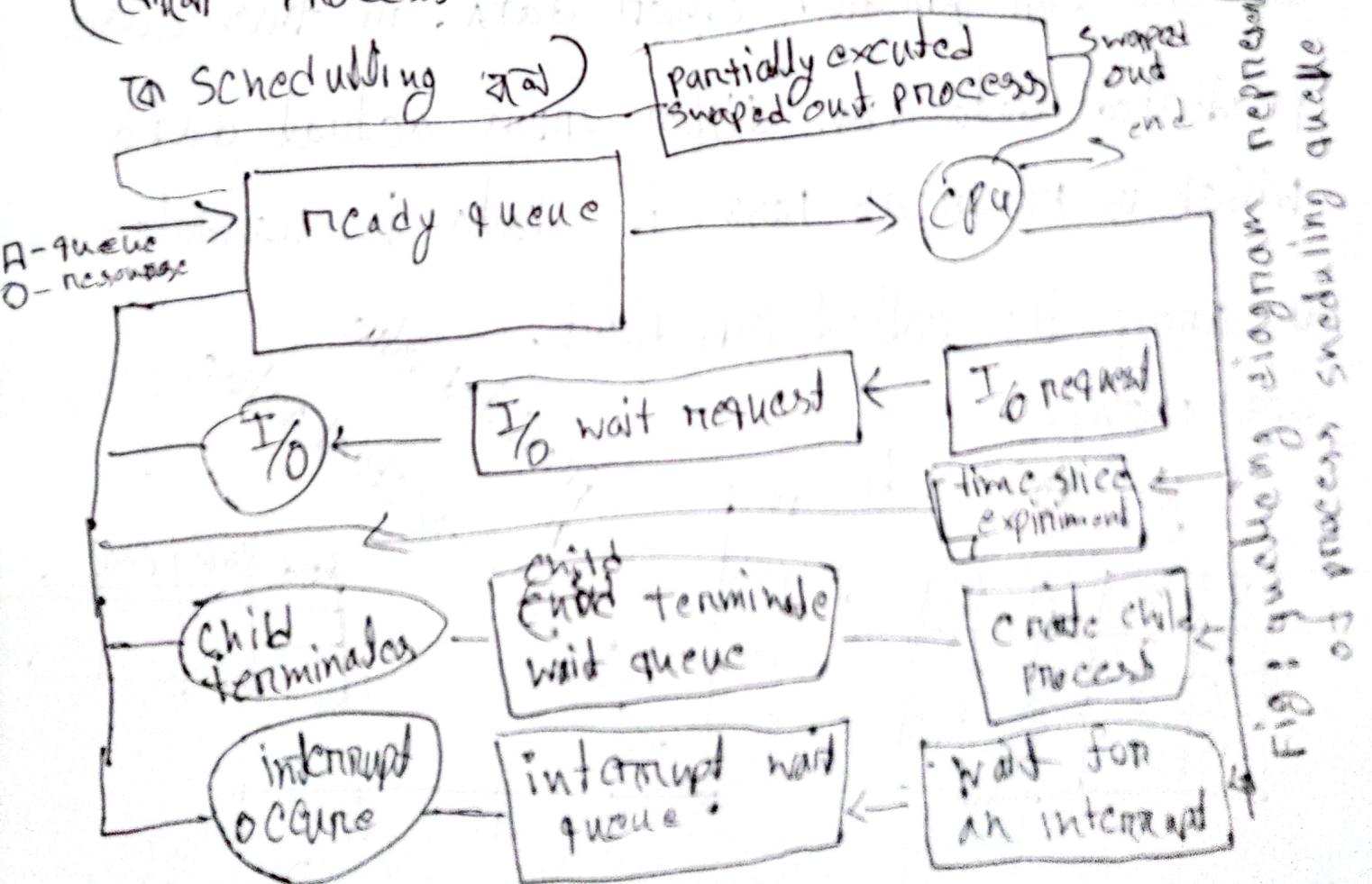


Fig: queuing diagram represent of process scheduling queue