OPERATING SYSTEMS

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OS-HW

SECTION2.

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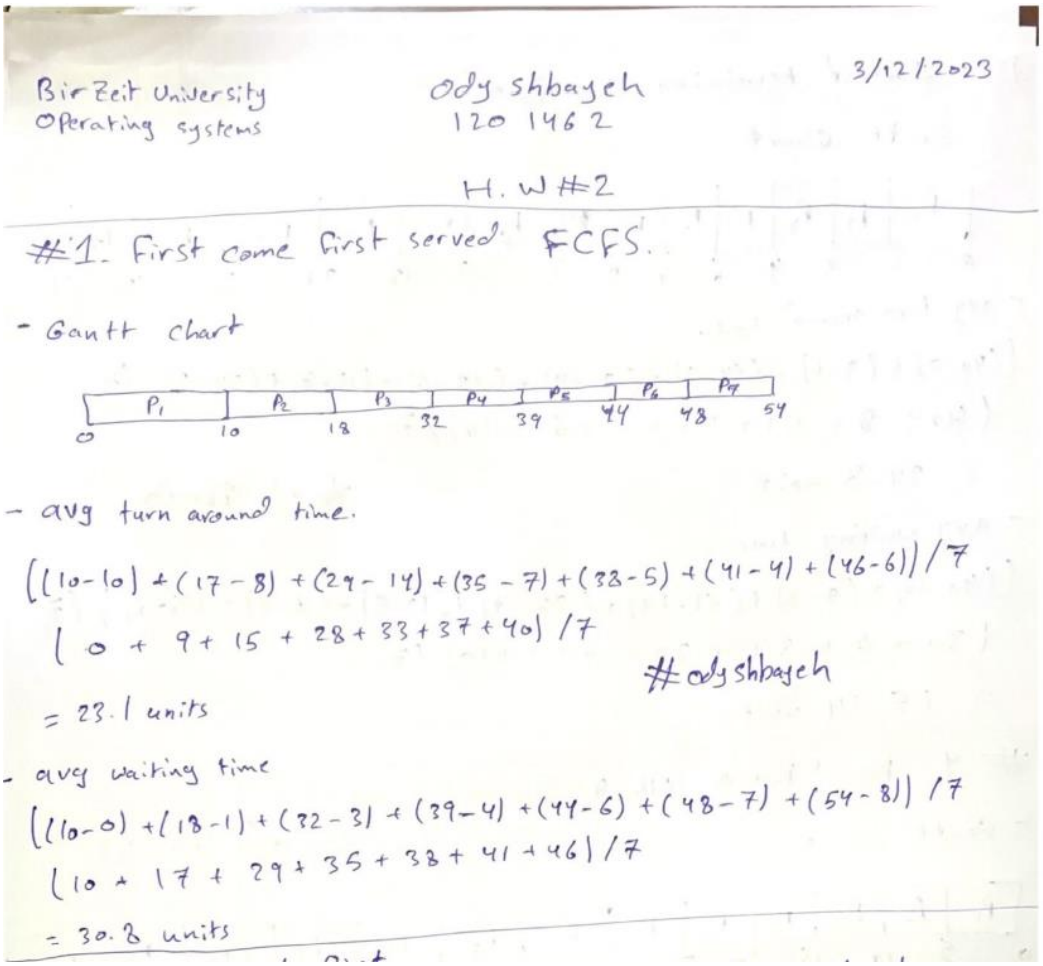
Consider the following set of processes:

Process	Arrival Time	Burst Time	Priority
P1	0	10	3
P2	1	8	2
P3	3	14	3
P4	4	7	1
P5	6	5	0
P6	7	4	1
P7	8	6	2

For each of the following scheduling algorithms, show the Gantt chart, average waiting time, and average turnaround time.

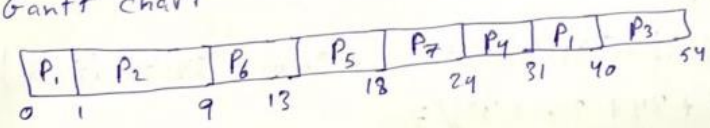
1- First Come First Served.



2- Shortest Job First.

#2 Shortest Job First — #ody shbayeh

- Gantt chart



- avg turn around time.

$((40-0)+(9-1)+(54-3)+(31-4)+(18-6)+(13-7)+(24-8))/7$

$(40+8+51+27+12+6+16)$

$= 22.8$ unit

- avg waiting time

$((40-10)+(8-8)+(51-14)+(27-7)+(12-5)+(6-4)+(16-6))/7$

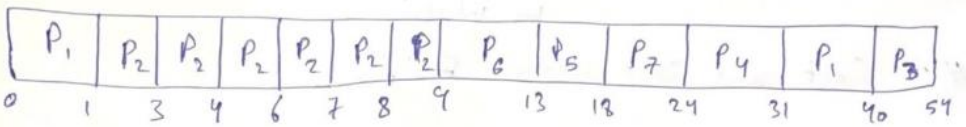
$(30+0+37+20+7+2+10)/7$

$= 15.14$ unit

3- Shortest Remaining Time First.

#3 Shortest Remaining time first

- Gantt Chart



- avg turn around time.

$((40-0)+(9-1)+(54-3)+(31-4)+(18-6)+(13-7)+(24-8))/7$

$(40+8+51+27+12+6+16)/7$

$= 22.8$ unit — #ody shbayeh

- avg waiting time

$((40-10)+(8-8)+(51-14)+(27-7)+(12-5)+(6-4)+(16-6))/7$

$(30+0+37+20+7+2+10)/7$

$= 15.14$ unit

4- Round Robin, with q = 5

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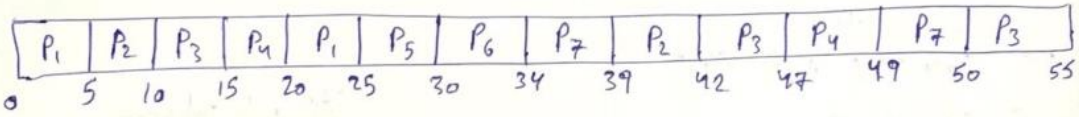
- Gantt chart



- avg turn around time.

$((25-0)+(42-1)+(55-3)+(49-3)+(49-4)+(30-6)+(34-7)+(50-8))/7$

$(25+41+52+45+24+27+42)/7$

$= 36.27$ unit

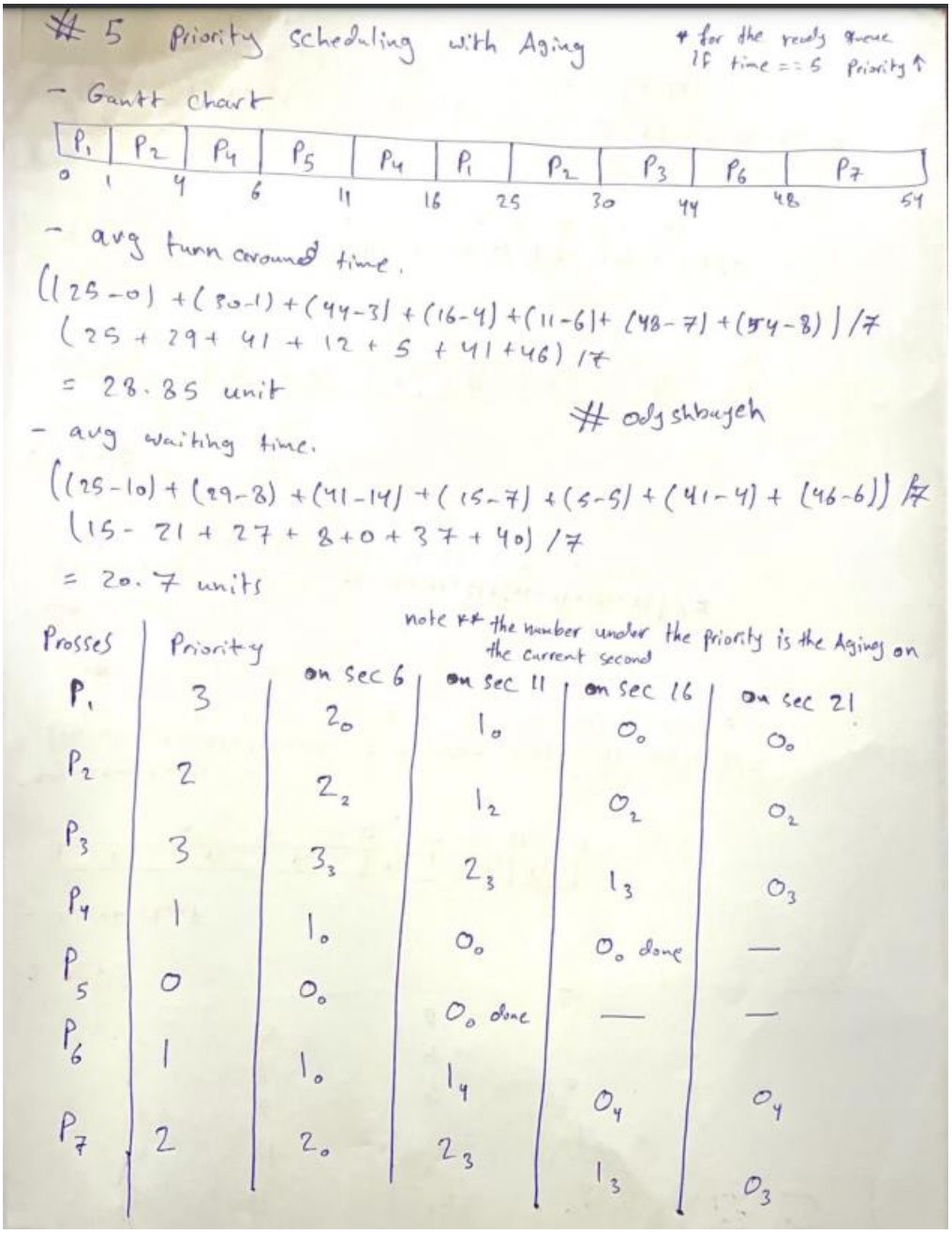
- avg waiting time.

$((25-10)+(41-8)+(52-14)+(45-7)+(24-5)+(27-4)+(42-6))/7$

$(15+37+38+38+19+23+36)/7$

$= 29.428$ unit

5- Priority Scheduling, with aging; where priority is decremented by 1 if the process remains in the ready queue for 5 time units.



5 Priority Scheduling with Aging

* for the ready queue
If time == 5 Priority ↑

- Gantt chart

P_1	P_2	P_4	P_5	P_4	P_1	P_2	P_3	P_6	P_7
0	1	4	6	11	16	25	30	44	48	54

- avg turn around time.

$((25-0)+(30-1)+(44-3)+(16-4)+(11-6)+(48-7)+(54-8))/7$

$(25+29+41+12+5+41+46)/7$

$= 28.85$ unit

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- avg waiting time.

$((25-10)+(29-8)+(41-14)+(15-7)+(5-5)+(41-4)+(46-6))/7$

$(15-21+27+8+0+37+40)/7$

$= 20.7$ units

note ** the number under the priority is the Aging on the current second

Prosses	Priority	on sec 6	on sec 11	on sec 16	on sec 21
P_1	3	2_0	1_0	0_0	0_0
P_2	2	2_2	1_2	0_2	0_2
P_3	3	3_3	2_3	1_3	0_3
P_4	1	1_0	0_0	0_0 done	—
P_5	0	0_0	0_0 done	—	—
P_6	1	1_0	1_4	0_4	0_4
P_7	2	2_0	2_3	1_3	0_3

Regards : odyshbayeh