Übungsblatt OS – Scheduling

1. Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time. In answering the questions, use nonpreemptive scheduling and base all decisions on the information you have at the time the decision must be made.

Process	Arrival Time	Burst Time
P1	0.0	8
P2	0.4	4
P3	1.0	1

a. What is the average turnaround time for these processes with the FCFS scheduling algorithm?
b. What is the average turnaround time for these processes with the SJF scheduling algorithm?
c. The SJF algorithm is supposed to improve performance, but notice that we chose to run process P1 at time 0 because we did not know that two shorter processes would arrive soon. Compute what the average turnaround time will be if the CPU is left idle for the first 1 unit and then SJF scheduling is used. Remember that processes P1 and P2 are waiting during this idle time, so their waiting time may increase. This algorithm could be known as future-knowledge scheduling.

2. Given jobs and corresponding remaining times required, determine the turnaround time required to finish for round robin scheduling with a quantum of 3.

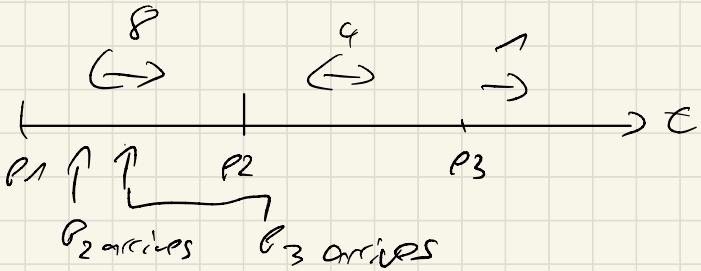
Job	Time remaining	Turnaround time
A	7	
B	5	
C	2	
D	8	

3. Name three situations when scheduling of a process is needed.

4. What is the first thing done when an interrupt starts?
A) registers of current running program saved, B) information pushed onto the stack by interrupt is removed, C) program jumps to interrupt, D) Scheduler chooses next process to execute, E) none of these

Process	Arrival Time	Burst Time
P1	0.0	8
P2	0.4	4
P3	1.0	1

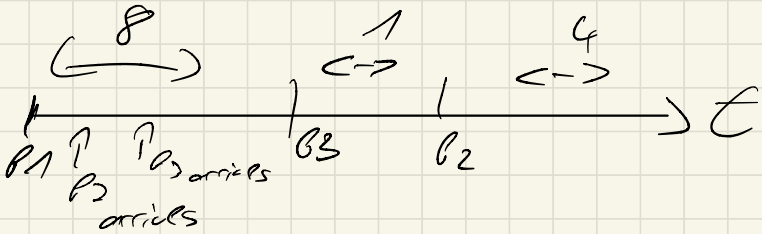
a)



P1: 8 P2: 12 - 0.4 = 11.6 P3 = 13 - 1 = 12

$$\Rightarrow \frac{8 + 11.6 + 12}{3} = \frac{31.6}{3} = 10.53 \text{ ZE}$$

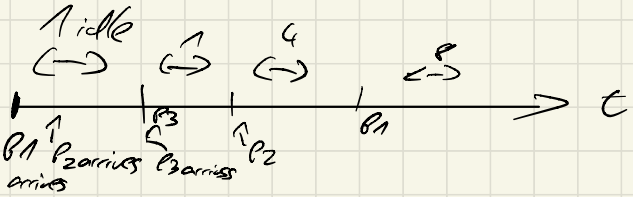
b)



P1: 8 P2: 13 - 0.4 = 12.6 P3: 9 - 1 - 8

$$\Rightarrow \frac{8 + 12.6 + 8}{3} = \frac{28.6}{3} = 9.53$$

c)

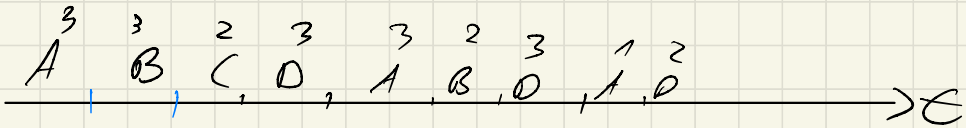


P1: 14 P2: 6 - 0,4 = 5,6 P3: 1

$$\Rightarrow \frac{14 + 5{,}6 + 1}{3} = \frac{20{,}6}{3} = 6{,}86$$

2.

Job	Time remaining	Turnaround time
A	7	20
B	5	16
C	2	8
D	8	22



A: 20 B: 16 C: 8 D: 22

3. When timer expires (with RR-scheduling)

When process switches to waiting queue

When process terminates.

4. A)