4 Rules Application – Example (FCFS)

Job Sequence	Processing Time	Flow Time	Due Date	Tardiness
A	2	2	7	0
B	8	10	16	0
C	4	14	4	10
D	10	24	17	7
E	5	29	15	14
F	12	41	18	23
Totals	41	120		54

Average completion time	120/6 = 20 days
Average number of jobs in the system	120/41 = 2.93 jobs
Average tardiness	54/6 = 9 days
Utilization	41/120 = 34.17%

4 Rules Application – Example (SPT)

Job Sequence	Processing Time	Flow Time	Due Date	Tardiness
A	2	2	7	0
C	4	6	4	2
E	5	11	15	0
B	8	19	16	3
D	10	29	17	12
F	12	41	18	23
Totals	41	108		40

Average completion time	108/6 = 18 days
Average number of jobs in the system	108/41 = 2.63 jobs
Average tardiness	40/6 = 6.67 days
Utilization	41/108 = 37.96%

4 Rules Application – Example (EDD)

Job Sequence	Processing Time	Flow Time	Due Date	Tardiness
C	4	4	4	0
A	2	6	7	0
E	5	11	15	0
B	8	19	16	3
D	10	29	17	12
F	12	41	18	23
Totals	41	110		38

Average completion time	110/6 = 18.33 days
Average number of jobs in the system	110/41 = 2.68 jobs
Average tardiness	38/6 = 6.33 days
Utilization	41/110 = 37.27%

4 Rules Application – Example (CR)

At t=0,

Job Sequence	Processing Time	Due Date	Critical Ratio Calculation
A	2	7	(7-0) / 2 = **3.5**
B	8	16	(16-0) / 8 = **2.0**
C	4	4	(4-0) / 4 = **1.0 (Lowest)**
D	10	17	(17-0) / 10 = **1.7**
E	5	15	(15-0) / 5 = **3.0**
F	12	18	(18-0) / 12 = **1.5**

•Job C is the first job to complete base on the lowest critical ratio.

4 Rules Application – Example (CR)

At t=4, day 4 [C completed],

Job Sequence	Processing Time	Due Date	Critical Ratio Calculation
A	2	7	(7-4) / 2 = **1.5**
B	8	16	(16-4) / 8 = **1.5**
C	-	-	-
D	10	17	(17-4) / 10 = **1.3**
E	5	15	(15-4) / 5 = **2.2**
F	12	18	(18-4) / 12 = **1.17 (Lowest)**

•Job F is the second job to complete base on the lowest critical ratio.

4 Rules Application – Example (CR)

At t=16, day 16 [C and F completed],

Job Sequence	Processing Time	Due Date	Critical Ratio Calculation
A	2	7	(7-16) / 2 = **-4.5 (Lowest)**
B	8	16	(16-16) / 8 = **0**
C	-	-	-
D	10	17	(17-16) / 10 = **0.1**
E	5	15	(15-16) / 5 = **-0.2**
F	-	-	-

•Job A is the third job to complete base on the lowest critical ratio.

4 Rules Application – Example (CR)

At t=18, day 18 [C, F and A completed],

Job Sequence	Processing Time	Due Date	Critical Ratio Calculation
A	-	-	-
B	8	16	(16-18) / 8 = **-0.25**
C	-	-	-
D	10	17	(17-18) / 10 = **-0.10**
E	5	15	(15-18) / 5 = **-0.60 (Lowest)**
F	-	-	-

•Job E is the fourth job to complete base on the lowest critical ratio.

4 Rules Application – Example (CR)

At t=23, day 23 [C, F, A and E completed],

Job Sequence	Processing Time	Due Date	Critical Ratio Calculation
A	-	-	-
B	8	16	(16-23) / 8 = **-0.875 (Lowest)**
C	-	-	-
D	10	17	(17-23) / 10 = **-0.60**
E	-	-	-
F	-	-	-

•Job B is the fifth job to complete base on the lowest critical ratio and follow by Job D in last.

4 Rules Application – Example (CR)

Job Sequence	Processing Time	Flow Time	Due Date	Tardiness
C	4	4	4	0
F	12	16	18	0
A	2	18	7	11
E	5	23	15	8
B	8	31	16	15
D	10	41	17	24
Totals	41	133		58

Average completion time	133/6 = 22.17 days
Average number of jobs in the system	133/41 = 3.24 jobs
Average tardiness	58/6 = 9.67 days
Utilization	41/133 = 30.83%

4 Rules Application – Example (CR)

Rules	Average Flow Time (days)	Average Tardiness (days)	Average Number of Jobs at the Work Center	Utilization (%)
FCFS	20.00	9.00	2.93	34.17
SPT	18.00	6.67	2.63	37.96
EDD	18.33	6.33	2.68	37.27
CR	22.17	9.67	3.24	30.83