

## Lecture 7 – Scheduling Policies Example

Schedule the following process using policies FCFS, STF, SRTF (Preemptive SJF), and RR (assuming Quantum = 4):

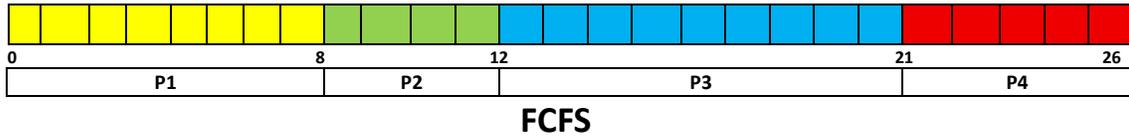
For each, calculate the Turnaround Time, the Waiting Time, and the Response Time (RT) and averages.

| Process | Arrival (AT) | Burst (BT) |
|---------|--------------|------------|
| P1      | 0            | 8          |
| P2      | 1            | 4          |
| P3      | 2            | 9          |
| P4      | 3            | 5          |

📌 Definitions (important):

- Completion Time (C)
  - Turnaround Time (TAT) = C – AT
  - Waiting Time (WT) = TAT – BT
  - Response Time (RT) = First CPU Start – Arrival Time
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✓ 1) FCFS (First Come First Served)

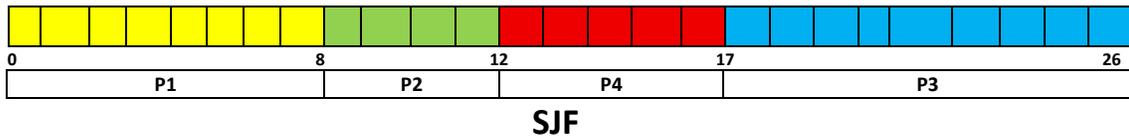


| Proc | AT | BT | Start | Exit (CT) | TAT = CT-AT | WT = TAT-BT | RT = Start-AT |
|------|----|----|-------|-----------|-------------|-------------|---------------|
| P1   | 0  | 8  | 0     | 8         | 8           | 0           | 0             |
| P2   | 1  | 4  | 8     | 12        | 11          | 7           | 7             |
| P3   | 2  | 9  | 12    | 21        | 19          | 10          | 10            |
| P4   | 3  | 5  | 21    | 26        | 23          | 18          | 18            |

**Averages (FCFS):**

- avg RT = **8.75**
  - avg WT = **8.75**
  - avg TAT = **15.25**
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✓ 2) SJF (Non-Preemptive)

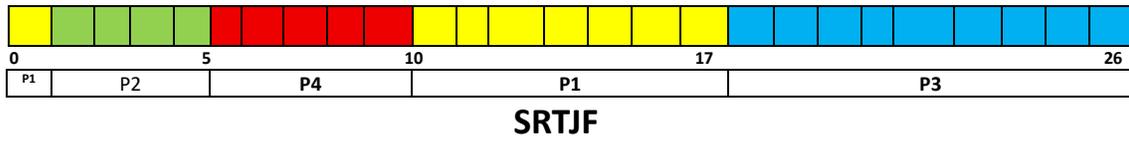


| Proc | AT | BT | Start | Exit (CT) | TAT | WT | RT |
|------|----|----|-------|-----------|-----|----|----|
| P1   | 0  | 8  | 0     | 8         | 8   | 0  | 0  |
| P2   | 1  | 4  | 8     | 12        | 11  | 7  | 7  |
| P4   | 3  | 5  | 12    | 17        | 14  | 9  | 9  |
| P3   | 2  | 9  | 17    | 26        | 24  | 15 | 15 |

**Averages (SJF):**

- avg RT = 7.75
  - avg WT = 7.75
  - avg TAT = 14.25
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✓ 3) SRTF (Preemptive SJF)



| Proc | AT | BT | Start (first) | Exit (CT) | TAT | WT | RT |
|------|----|----|---------------|-----------|-----|----|----|
| P1   | 0  | 8  | 0             | 17        | 17  | 9  | 0  |
| P2   | 1  | 4  | 1             | 5         | 4   | 0  | 0  |
| P4   | 3  | 5  | 5             | 10        | 7   | 2  | 2  |
| P3   | 2  | 9  | 17            | 26        | 24  | 15 | 15 |

**Averages (SRTF):**

- avg RT = **4.25**
  - avg WT = **6.50**
  - avg TAT = **13.00**
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**Averages Table**

| <b>Policy</b>                   | <b>avg RT</b> | <b>avg WT</b> | <b>avg TAT</b> |
|---------------------------------|---------------|---------------|----------------|
| <b>FCFS</b>                     | <b>8.75</b>   | <b>8.75</b>   | <b>15.25</b>   |
| <b>SJF (non-preemptive)</b>     | <b>7.75</b>   | <b>7.75</b>   | <b>14.25</b>   |
| <b>SRTF (preemptive)</b>        | <b>4.25</b>   | <b>6.50</b>   | <b>13.00</b>   |
| <b>RR q=4</b>                   | <b>4.50</b>   | <b>11.75</b>  | <b>18.25</b>   |
| <b>RR q=2</b>                   | <b>2.00</b>   | <b>12.75</b>  | <b>19.25</b>   |
| <b>RR q=6</b>                   | <b>6.50</b>   | <b>12.00</b>  | <b>18.50</b>   |
| <b>Overall mean of policies</b> | <b>5.63</b>   | <b>9.92</b>   | <b>16.42</b>   |