

OSTEP Chapter 7

ECE 3600, Fall 2022

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1. CPU Scheduling

policies, metrics, performance, fairness, preemptive vs. non-preemptive

turnaround time = time from arrival to completion

FIFO - First In, First Out

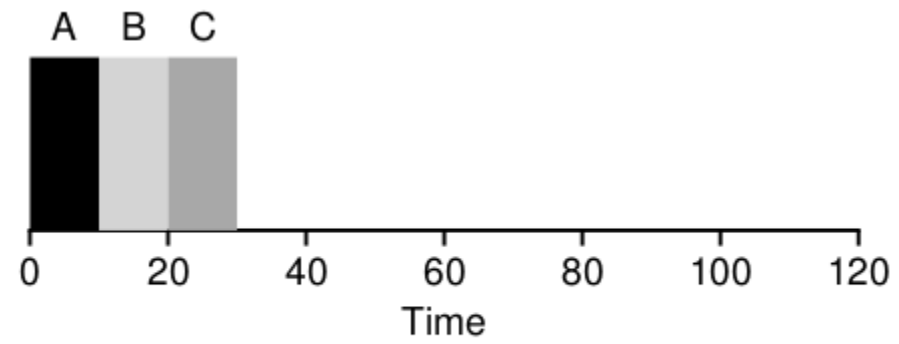


Figure 7.1: FIFO Simple Example

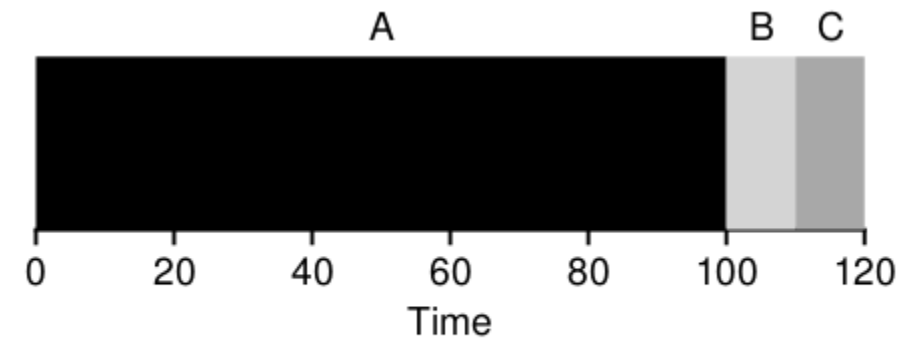


Figure 7.2: Why FIFO Is Not That Great

2. SJF - Shortest Job First

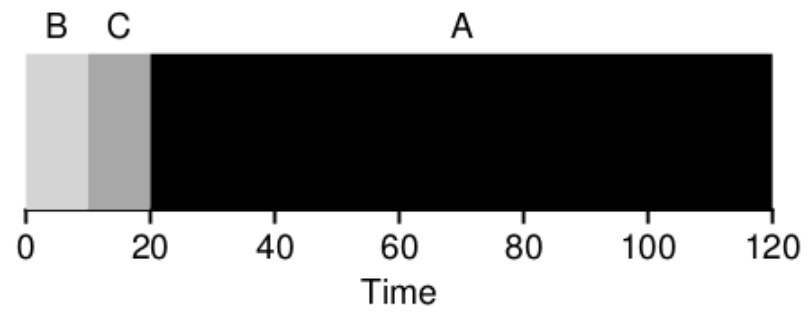


Figure 7.3: SJF Simple Example

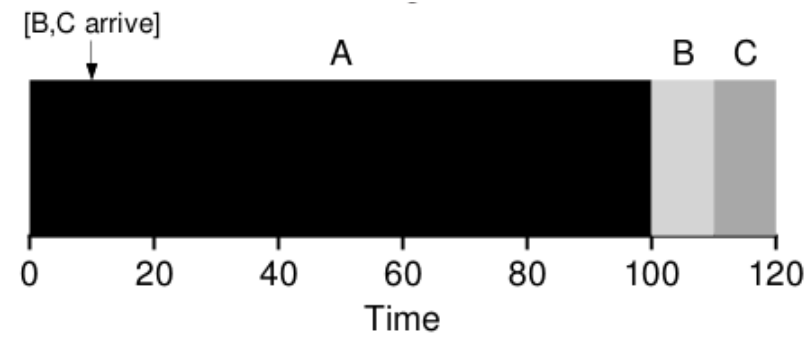


Figure 7.4: SJF With Late Arrivals From B and C

STCF - Shortest Time-to-Completion First

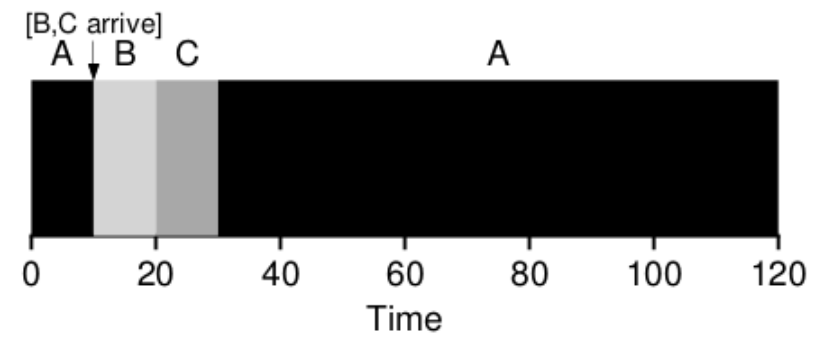


Figure 7.5: STCF Simple Example

3. RR - Round-Robin

response time = wait time from arrival to first scheduled

time slice = scheduling quantum

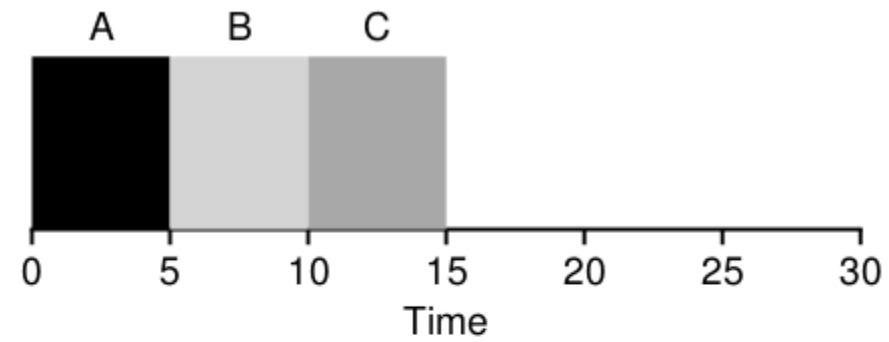


Figure 7.6: SJF Again (Bad for Response Time)

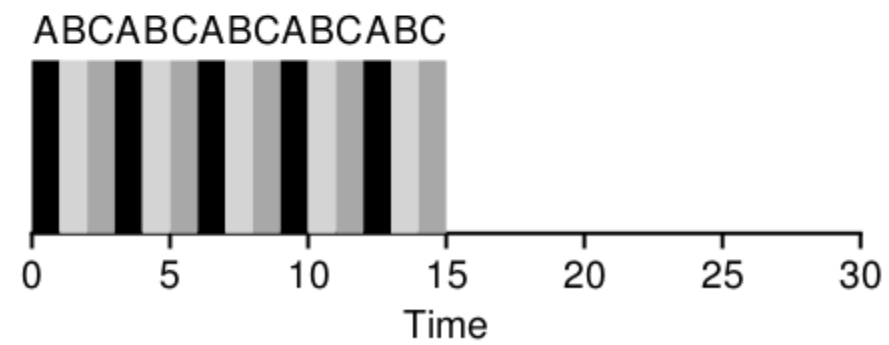


Figure 7.7: Round Robin (Good For Response Time)

4. Overlap

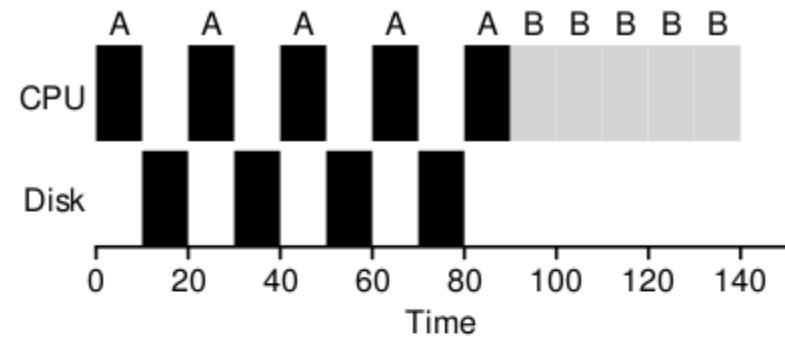


Figure 7.8: Poor Use Of Resources

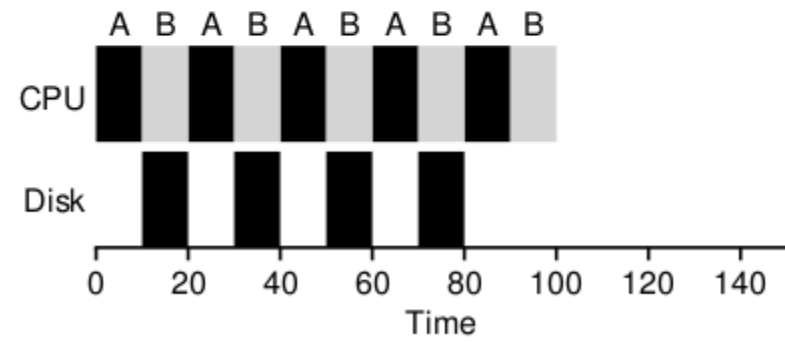


Figure 7.9: Overlap Allows Better Use Of Resources

In general the run-times of jobs are not known in advance

--> multi-level feedback queue

5. Exercises

Exercises from the book using [scheduler.py](#):

1. Compute the response time and turnaround time when running three jobs of length 200 with the SJF and FIFO schedulers.
2. Now do the same but with jobs of different lengths: 100, 200, and 300.
3. Now do the same, but also with the RR scheduler and a time-slice of 1.
4. For what types of workloads does SJF deliver the same turnaround times as FIFO?
5. For what types of workloads and quantum lengths does SJF deliver the same response times as RR?
6. What happens to response time with SJF as job lengths increase? Can you use the simulator to demonstrate the trend?
7. What happens to response time with RR as quantum lengths increase? Can you write an equation that gives the worst-case response time, given N jobs?