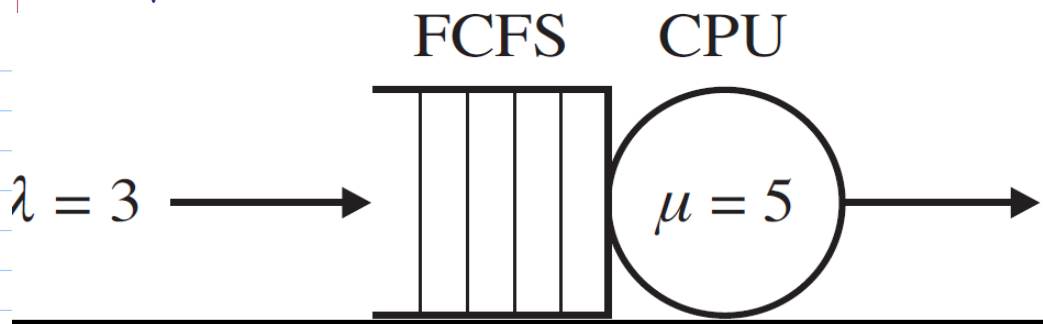


1.1 [H]

Example 1 [H]: Doubling the Arrival Rate



FCFS; First Come First Serve

λ is the average arrival rate (jobs/sec)

μ is the average service rate (jobs/sec)

In this particular example, each job needs $\frac{1}{5}$ sec of service

This system is not overloaded, b/c $3 < 5$

Let $E[T]$ be the mean response time of the system, i.e., the time from when a job arrives until it completes service.

Question . Starting tomorrow, the arrival rate (λ) will double, but you want the mean response time ($E[T]$) to stay the same.

By how much should you increase the CPU speed?

- (a) Double it ($\mu = 10$)
- (b) More than double ($\mu > 10$)
- (c) Less than double ($\mu < 10$)

The correct answer is (c).
In fact, doubling μ and λ together cuts the mean response time in half!