

Midterm 2 Study Guide

1. Determine the minimum FIFO size for the following scenario. On average the FIFO gets filled at a rate of 1 item/ms. Every second there may be a burst of 8 new items in 100 μ s. The FIFO is processes fully every 100 ms. A full FIFO can be processed in 2 ms. You can assume that FIFO items that come in while processing will be processed.
2. The following processes are submitted to a scheduler at the same time in the following order.

Process ID	Submit order	Duration	Priority
10	4	100 μ s	2
32	1	500 μ s	3
76	3	50 ms	1
83	2	2 s	4

Please show the order of execution and calculate the throughput (/s) for the first second, average turnaround time, and average waiting time for a first come first serve scheduler, shortest job scheduler, and a priority scheduler.

3. List the steps in the output compare ritual.
4. The dining philosophers problem involves five philosophers sitting around a table eating or thinking. Each philosopher can only do one thing at a time. The five philosophers sit at a circular table and use chopsticks to eat. There is one chopstick between each philosopher as shown in Figure 1. A philosopher desiring to eat must use two chopsticks, the one on his immediate right and the one on his immediate left. The philosophers never speak to each other creating the potential for deadlock. Deadlock can occur if every philosopher grabs his right chopstick at the same time assuming that philosophers desiring to eat will not release the chopstick they have until they have eaten. Describe a semaphore based solution to solve the dining philosophers problem that avoids deadlock.



Figure 1: The Dining Philosophers