



SHEET 6: OPERATING SYSTEMS

1.

Suppose three items R, S, and T are placed in a queue in that order. Then one item is removed from the queue before a fourth item, X, is placed in the queue. Then one item is removed from the queue, the items Y and Z are placed in the queue, and then the queue is emptied by removing one item at a time. List all the items in the order in which they were removed.

2.

What is a multitasking operating system?

3.

Suppose a computer contained 512 MB of main memory, and an operating system needed to create a virtual memory of twice that size using pages of 2 KB. How many pages would be required?

4.

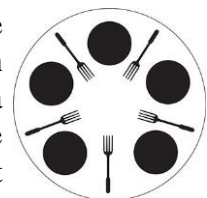
What is the distinction between application software and system software? Give an example of each.

5.

Suppose a multiprogramming operating system allocated time slices of 10 milliseconds and the machine executed an average of five instructions per nanosecond. How many instructions could be executed in a single time slice?

6.

Five philosophers¹ are sitting at a round table. In front of each is a plate of spaghetti. There are five forks on the table, one between each plate. Each philosopher wants to alternate between thinking and eating. To eat, a philosopher requires possession of both the forks that are adjacent to the philosopher's plate. Identify the possibilities of deadlock and starvation that are present in the dining philosophers problem



7.

Using [NetLogo](#) (either online or offline) discuss the problem 6