

COMP9334 Revision Questions for Week 2

These questions are taken from Chapter 3 of Mensace et al. "Performance by Design". The questions are Q5,6,7 and 10 from Chapter 3. They have been reproduced below for your convenience.

In addition there is a question on Poisson process.

5. A transaction processing system is monitored for one hour. During this period, 5,400 transactions are processed. What is the utilization of a disk if its average service time is equal to 30 msec per visit and the disk is visited three times on average by every transaction?
6. The average delay experienced by a packet when traversing a computer network is 100 msec. The average number of packets that cross the network per second is 128 packets/sec. What is the average number of concurrent packets in transit in the network at any time?
7. A file server is monitored for 60 minutes, during which time 7,200 requests are completed. The disk utilization is measured to be 30%. The average service time at this disk is 30 msec per file operation request. What is the average number of accesses to this disk per file request?
10. An interactive system has 50 terminals and the user's think time is equal to 5 seconds. The utilization of one of the system's disk was measured to be 60%. The average service time at the disk is equal to 30 msec. Each user interaction requires, on average, 4 I/Os on this disk. What is the average response time of the interactive system?

Question on Poisson Process: A server receives requests from two arrival processes. Both arrival processes are Poisson. The rates of these two processes are r_1 and r_2 respectively. Assuming these two processes are independent, prove that the aggregation of these two arrival processes is also Poisson. What is the aggregated arrival rate?