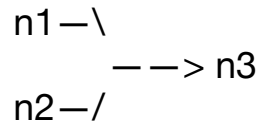


## ACN Midsem 1:

1. Given  $\lambda$  and  $\mu$ , what is the avg. waiting time and avg. queue length, a) M/M/1 queue b) If processing is a deterministic process
2. M/M/1/5 queue, given  $\rho$  a) draw state diagram, b) find formula using flow constraints, c) blocking probability
3. Given  $\lambda_n = a^n$ ,  $\lambda$ ,  $\mu$  constant for all  $n$ , i) Draw state diagram ii) Write flow balancing equations, iii) Solve for  $P_0$ ,  $P_n$
4. For M/M/1 queue, given  $\mu$ ,  $\lambda$ , find the avg. time spent by a packet in system
5. Would you use djikstra or bellman ford for (Justify)
  1. Setting up static routing table for a complex LAN
  2. A protocol to be deployed at the gateway to connect to the internet?
6. Nodes: M/M/1. Avg. time for packet arriving at  $n_1$  to exit at  $n_3$ ? Arrival process at  $n_3$  is poisson. Packet size given.  $\lambda(n_1)$ ,  $\mu(n_1)$  given.



$$\begin{aligned}
 \mu(n_1) &= \mu(n_2) = \mu(n_3) \\
 \lambda(n_2) &= \lambda(n_1)/10
 \end{aligned}$$