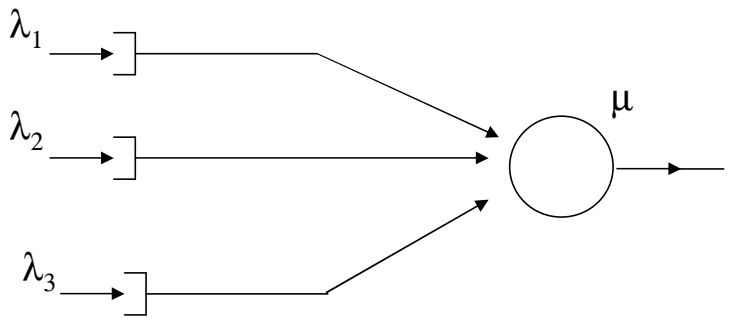
Project No. 6
Simulation of an WFQ or DRR Queue

ECE 642
Dr. Bijan Jabbari

Consider a high speed transmission link represented by a WFQ (Weight Fair Queueing) or DRR (Deficit Round Robin) model of single-server with three input sessions as depicted below. Each session has Poisson arrival and exponential service time. The link is assumed to have a capacity of 155 Mbps and the length of packets are exponentially distributed with mean packet size of 2325 bits. We want to simulate the system for the desired utilization.



Part A: Given the weight $w = 1$ for each session, and desired load for each session as $\rho_i = 1/3 * \rho$, plot the expected queue size and mean delay through the system vs. total throughput for $\rho = 0.3, 0.5, 0.6, 0.7, 0.8, 0.9$.

Part B: Given the weight $w = 1$ for each session, and desired load for session 1 and 2 as $\rho_i = 1/4 * \rho$, and for session 3 $\rho_i = 1/2 * \rho$, plot the expected queue size and mean delay through the system vs. total throughput for $\rho = 0.3, 0.5, 0.6, 0.7, 0.8, 0.9$.

Compare the simulation results with the analysis results for FIFO, try to explain the benefits of using the WFQ or DRR over FIFO.