Problem of the week #7:
Given - Feb. 27, 2003; Due - March 11, 2003 (in class).

Consider the following modification of the exponential backoff protocol.

Every station i sends its current queue length q_i with the message. If i transmits successfully then all other stations will not transmit for the next q_i steps, thus enabling i to empty its queue. (Backoff counter is set to 0, as usual, after successful transmission.) However, if new messages arrive at i during this interval, then they cannot get through without contention – that is, after q_i steps other stations will try to transmit and new messages at i will have to contend with that. As before, after every failure, the backoff counter is increased by 1.

What can you say about the stability of this protocol? What can you say about the average delay for a message before it gets successfully transmitted?

I have been thinking about this problem, and seems pretty much open (or may be not!). The best answer

will get twice the weightage (of a normal potw). You have five more days than usual to solve this.