Implement a simulation of how many messages are sent to a ticket granting service in a network. Assume that there are 100 users accessing 10 different services. Assume that users hold on to their tickets until they expire, and tickets are good for 30 minutes after requesting them.

Assume that every so often, a user issues a request to a service on the network which they select at random (uniform distribution). The number of minutes between requests, however, is taken from an exponential distribution with $\lambda = .25$. The CDF for the exponential distribution is given by the curve $y = 1 - e^{-\lambda x}$ and is defined for all $x \geq 0$. (Remember that the trick to generate random numbers from an arbitrary distribution is to select a uniform random number between 0 and 1 as the y for its CDF and solve for x. Or just use the exponential random number generator in the programming language you're using if it has one!)

Run the simulation for 8 hours (of simulation time). How many tickets were needed to be granted? What is the average tickets per user? What is the average tickets per day? Play around with the expiration time and see how the system performs.