

EXAM MLC QUESTIONS OF THE WEEK

S. Broverman, 2007

Week of October 22/07

The number of employees at a large company who have surfed the internet at work for non-work related reasons follows a Poisson process with a rate of 100 per hour. When an employee surfs the internet at work for non-work related reasons, the amount of time spent on this activity has an exponential distribution with a mean of 15 minutes. Using the normal approximation, find the 95-th percentile for the amount of time spent on non-work related internet surfing for employees who engage in this activity during an 8 hour work day at this company.

The solution can be found below.

Week of October 22/07 - Solution

S , the amount of time spent surfing in a day follows a compound Poisson distribution with frequency N which has a mean of 800 (in an 8 hour day), and severity X which is exponential with a mean of .25 (hours).

$$E[S] = E[N] \cdot E[X] = 800(.25) = 200 \text{ hours and}$$

$$Var[S] = E[N] \cdot E[X^2] = 800(2 \times .25^2) = 100 .$$

Applying the normal approximation to S , the 95-th percentile of S is

$$E[S] + 1.645\sqrt{Var[S]} = 200 + 1.645\sqrt{100} = 216.45 \text{ hours.}$$