

Problem 123

N : annual number of claims

S : total annual claim amount

$S|N=1 \sim \text{Exponential} (\lambda=5)$

$S|N>1 \sim \text{Exponential} (\lambda=8)$

$$p(4 < S < 8) = p(4 < S < 8 | N=1) \cdot p(N=1) + p(4 < S < 8 | N>1) \cdot p(N>1)$$

$$p(a < X < b) = e^{-\frac{a}{\lambda}} - e^{-\frac{b}{\lambda}}$$

$$= (e^{-\frac{4}{5}} - e^{-\frac{8}{5}}) \left(\frac{1}{3}\right) + (e^{-\frac{4}{8}} - e^{-\frac{8}{8}}) \left(\frac{1}{6}\right)$$

$$= \underline{\underline{.122}}$$

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