Stat 479
Fall 2009
Quiz 5
October 15, 2009

1. Claim frequencies are distributed as follows:

N	Probability
0	0.1
1	0.2
2	0.3
3	0.4

Claim severities are distributed as follows:

X	Probability
1	0.25
2	0.75

Calculate the Net Stop Loss Premium for an aggregate deductible of 4.5.

Stop Loss will only pay if loss exceeds 4.5

$$(5-4.5)\left[Pr(S=5)\right]+(6-4.5)\left[Pr(S=6)\right]$$

$$= (.5)\left[Pr(N=3)\right]\left[Pr(\text{one } X=1 \text{ and two } X=2\right]$$

$$+ 1.5\left[Pr(N=3)\right]\left[Pr(\text{three } X=2)\right]$$

$$= (.5)(.4)(.25)(.75)^2(3) + 1.5(.4)(.75)^3$$

$$= .3375$$

2. The number of claims for dental insurance is distributed as a Poisson distribution.

The amount of each individual claim is follows a gamma distribution with $\alpha = 2$ and $\theta = 100$.

The Var[S] = 138,000.

Calculate the expected value of the aggregate claims.

$$Var[S] = \lambda \cdot E[X^2] = 138,000$$

$$= \lambda(\alpha)(\alpha+1)(\theta^2) = 138,000$$

$$= \lambda(2)(3)(100)^2 = 60,000\lambda$$

$$\therefore 60,000\lambda = 138,000$$

$$\lambda = 2.3$$

$$E(S) = E(N)\,E(X) = (\lambda)(\alpha\theta) = (2.3)(2)(100)$$

$$= \underline{\underline{460}}$$