

Probability

Assignment 1

1) mean = 800
Standard deviation = $\sigma = 100$

2) For claim size on home insurance

$$\text{Mean}_H = \bar{X}_H = 800$$

$$\text{Standard deviation} = \sigma_H = 100$$

For Car insurance

$$\bar{X}_C = 1200$$

$$\sigma_C = 300$$

All the claims are independent of each other

Accounting

$$\text{For Home claims} = 800 = X_H$$

$$\text{For Car claims} = 0$$

Find: Probability

$$\begin{aligned} P(H) &= \frac{1}{\sigma_H} (X_H - \bar{X}_H) \\ &= \frac{800 - 800}{100} \\ &= 0 \end{aligned}$$

$$P(H) = 0$$

$$\begin{aligned} P(C) &= \frac{0 - 1200}{300} \\ &= -4 \end{aligned}$$

$$P(C) = -4$$

$$P(H/C) = \frac{P(H \cap C)}{P(C)}$$

$$P(H/C) = \frac{1}{4}$$

2) No. of claims = N
 $P(N=n) = \frac{N}{n+2}$

9) Randt

For X = Random Variable.

mean = 3

Standard deviation = 2

For Random Variable Y .

Mean = 4.

Standard deviation = 1.

Correlation coefficient = $r = 0.3$

$$r = \frac{\text{Cov}(X, Y)}{\sigma_X \cdot \sigma_Y}$$

$$-0.3 = \frac{\text{Cov}(X, Y)}{2 \times 1}$$

$$[-0.6 = \text{Cov}(X, Y)]$$

$\therefore Z = X + Y$

$\therefore \text{mean } Z = 7$

$\sigma_Z = 3$

$$r = \frac{\text{Cov}(X, Z)}{\sigma_X \cdot \sigma_Z}$$

$$\therefore -0.3 = \frac{\text{Cov}(X, Z)}{2 \cdot 3}$$

$$\therefore -1.8 = \text{Cov}(X, Z)$$

$\therefore \sigma_Z = 3 \quad \therefore \text{Var } Z = 3^2 = 9$