

STAT 479
Quiz 4
Spring 2017
March 7, 2017

1. KC Life Insurance Company has 1300 female insureds and 700 male insureds. All the insureds are 82 years old and their future lifetimes are independent. The probability that a female dies in the next year is 0.08 while the probability that a male dies is 0.10.

The death benefits for females are distributed as an exponential distribution with a mean of 10,000. The death benefits for the males are distributed as a uniform distribution on the range of 5000 to 12,000.

Let S be the random variable representing the aggregate claims from these 2000 insureds.

Find $E[S]$ and $\sqrt{\text{Var}[S]}$.

2. You are given the following sample:

X: 10 20 30 40 50

The following estimator is used to estimate σ^2 :

$$\frac{\sum_i (X_i - \bar{X})^2}{n+1}$$

Calculate the bias in this estimator.

3. **(BONUS)** An urn contains four balls. Each ball has a unique number on it. The numbers on the balls are 2, 4, 6, and 8.

Two balls are drawn from the urn without replacement and the maximum number drawn is used to estimate the largest number on a ball in the urn.

Calculate the Mean Square Error of this estimator.