Lesson: What is Actuarial Science

An actuary is a business professional who analyzes\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name Two Bachelor’s Degrees that are commonly possessed by Actuaries.

What fields do actuaries primarily work in?

Since the Actuarial field and exams required revolve around mathematics and statistics, actuaries are highly analytical. Actuaries typically work in teams, so they must exhibit strong communication skills. Actuaries work with big data and must be proficient in computer programming and statistical software (i.e. R & Excel).

Name Three Mathematical Applications.

In Insurance, the Law of Large numbers is crucial. A probability of an occurrence can be applied to nearly anything. This allows actuaries to assign and use these probabilities to create expected values for the scenario (i.e. Claim frequency or severity). They can then use this information to calculate the price of insurance products and mitigate the risk that they don’t attain the profit they desire.

The Two Primary Actuarial Societies are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_ specializes in Property and Casualty Insurance.

\_\_\_\_\_\_\_\_\_\_\_\_\_ specializes in Life and Health Insurance.

The typical Actuarial fellowship requires approximately \_\_\_\_\_ exams.

Studying for each examine typically requires around \_\_\_\_\_\_ study hours.

The first two exams are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Practice Problem:

1. A company provides each of its employees with a death benefit of 100. The company purchases insurance that pays the cost of total death benefits in excess of 400 per year. The number of employees who will die during the year is a Poisson random variable with mean 2.

Calculate the expected annual cost to the company of providing the death benefits, excluding the cost of the insurance.

\*Remember x in the Probability Mass Function is the is the probability of exactly X occurrences because this is a discrete distribution.

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

What are the 5 different amounts the company can pay?

What is the formula for the expected value?

100\_\_\_\_\_\_\_+200\_\_\_\_\_\_\_\_+300+\_\_\_\_\_\_\_\_400\_\_\_\_\_\_\_\_\_

Find the probabilities for each scenario

100P(Y=1) = 100(e-2 X 21)/1! = 27.07

200P(Y=2) = 200(e-2 X 2\_\_)/2! = \_\_\_\_\_

300P(Y=3) = 300(e-2 X 2\_\_)/\_\_! = \_\_\_\_\_

P(Y>4) = 1 – [P(Y=\_\_)+P(Y=\_\_)+P(Y=\_\_)+P(Y=\_\_)]

\*Using Values from above\*

400P(Y>4) = 1-(P(Y)=0,1,2,3) = 400(1-.857)= 57.15

\_\_\_\_\_\_+\_\_\_\_\_\_+\_\_\_\_\_\_+\_\_\_\_\_\_=\_\_\_\_\_\_