MS Module 24: Actuarial risk classification – other bias functions (overview)

(The attached PDF file has better formatting.)

Reading on discussion forum: Actuarial risk classification

Statisticians and business firms may have different goals.

- Statisticians often minimize the mean squared error, which is equivalent to choosing the unbiased model with minimum variance.
- Business firms generally seek to maximize expected profits, with a constraint on the assumed risk.

Risk is often assumed to proportional to the standard deviation of profits, not variance of profits. The variance is strongly influenced by high risk policyholders. Business firms may prefer scenarios with higher expected profits even if the variance of profits is much higher.

Know how to solve risk classification problems using

- least squares for an additive model
- least squares for a multiplicative model

Final exam problems test the iterative procedure: given a bias function (such as least squares), the relativities along one dimension, and the observed data, you derive the relativities along the other dimension at the next step of the iterative procedure.

Know the χ^2 bias function for the iterative process. The χ^2 test is explained in previous modules; the reading for this module applies the χ^2 function to actuarial risk classification.

Know the maximum likelihood bias function for a Poisson distribution. Maximum likelihood functions and the Poisson distribution are on the actuarial exams, and they are reviewed in the background textbook chapters for this course. The reading for this module applies the maximum likelihood bias function to risk classification.