STAT 4703, Actuarial Models II

The course is open to anyone who has successfully completed STAT 3701.

Calendar description:
In STAT 3701, we covered the types of models that can be used for loss models in actuarial work. In this course we look into the problem of choosing which model to use, and how to estimate the parameters in that model.

Course description:
Models for loss severity: parametric models, effect of policy modifications, tail behaviour. Models for loss frequency: \((a, b, 0), (a, b, 1)\), mixed Poisson models; compound Poisson models. Aggregate claims models: moments and moment generating function; recursion. Classical ruin theory.

It is intended that this course should cover a portion of the syllabus for that part of the professional actuarial examination concerned with the Construction and Evaluation of Actuarial Models. Currently, this corresponds to most of the material listed above from Chapters 12-16, 20, and 21 that is on the syllabus for the Society of Actuaries Exam C. This course syllabus should be updated as needed, with this objective in mind.


Evaluation:
6–8 assignments (15%), midterm (30%), closed-book final exam (55%)

Textbook


Topics

This course covers the fundamentals of actuarial loss models. The topics covered correspond to chapters 10–16 and 20 of the required text and the study notes from SOA for Exam C. They include the following:

1. Estimation for complete data: empirical distributions for complete, individual data and grouped data.

2. Estimation for modified data: point estimation, Mean, variance, and interval estimation, kernel density models, approximations for large data sets.

4. Frequentist estimation for discrete distributions

5. Model selection: representations of the data and model, hypothesis tests, two types of selection criteria, extreme value models, copula models, models with covariates.

6. Simulation