

# Introduction and Objectives

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## INTRODUCTION

This module will introduce you to a varied assortment of specialized general insurance applications, some of which are advanced business analytics techniques. We define advanced business analytics as a set of tools and techniques to assist in key business decisions. While the emphasis is on understanding and implementing results, you should always keep in mind the broader context of decision making, including the analysis of risk.

## OVERALL OBJECTIVES

After you complete this module, you will be able to:

- Understand classification ratemaking
- Use the computing environment R to analyze data
- Use generalized linear models (GLM) to perform classification ratemaking
- Understand and compute general insurance premium liabilities
- Understand catastrophe modeling and its uses
- Use various models, including GLMs, to estimate variability in reserve estimates
- Understand how bootstrap methods are used in estimating variability in reserve estimates
- Understand and use methods to monitor the estimates of ultimate values for general insurance claims

## MODULE SECTIONS

- Section 1: Module Overview
- Section 2: The Generalized Linear Model
- Section 3: Classification Ratemaking
- Section 4: Reserve Variability
- Section 5: Further Topics in Reserve Variability
- Section 6: Monitoring Results
- Section 7: Premium Liabilities
- Section 8: Catastrophe Modeling

## General Insurance Applications: Introduction and Objectives

### Section 2 Objectives

After completing this section, you will be able to:

- Use R to perform a multiple regression analysis
- Understand the advantages of GLM over Ordinary Least Squares (OLS) regression
- Identify the main components of a GLM
- Select an appropriate model within GLM
- Estimate the parameters of a GLM model
- Interpret model output and assess the quality of a model

### Section 3 Objectives

After completing this section, you will be able to:

- Understand how the minimum bias method can be replicated by an appropriate GLM.
- Use a GLM to select an appropriate model for the observed pure premiums.
- Use a GLM to assess the value of a given classification variable.

### Section 4 Objectives

After completing this section, you will be able to:

- Implement the chain ladder (CL) method in R.
- Use a generalized linear model (GLM) to model claim development and estimate ultimate claims.
- Use the nonparametric Mack method to estimate ultimate claims.
- Use both the GLM and the Mack method to quantify the uncertainty in reserve estimates.

### Section 5 Objective

After completing this section, you will be able to:

- Estimate reserve variability using the bootstrap method.

### Section 6 Objectives

After completing this section, you will be able to:

- Identify and describe approaches for monitoring results.
- Prepare a comparison of actual to expected claims.

### Section 7 Objectives

After completing this section, you will be able to:

- Understand the purpose of general insurance premium liabilities.
- Calculate the premium liabilities for a general insurance company.
- Understand the accounting for general insurance premium liabilities.

## General Insurance Applications: Introduction and Objectives

### Section 8 Objectives

After completing this section, you will be able to:

- Understand the purpose and development of catastrophe models.
- Understand the type of output produced by these models.
- Understand how the model output can be used in actuarial tasks.