## Books/Tools Referenced:

RM *Regression Modeling with Actuarial and Financial Applications* by Edward W. Frees

ISL *An Introduction to Statistical Learning with Applications in R* by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani
A PDF version of the text is linked to from the SOA SRM Exam Syllabus can be downloaded here.

FPP *Forecasting: Principles and Practice* by Rob J. Hyndman and George Athanasopoulos
This text is available online here.

AG Academic Goal for SRM

See SOA Exam SRM syllabus for topics and learning objectives. This course focuses on topics 1-3.

## Basics of Statistical Learning

Read/work the following. Focus on vocabulary and creating an organizational structure for the topics covered in "statistical learning" as discussed in the readings (be sure to include the different categories of analysis and when they are appropriate). Create a study sheet defining all key terms with an appropriate hierarchy imposed on the information.

- ISL Ch 1 (you can skip the *This Book* and *Who Should Read This Book?* sections) - if you haven't taken Linear Algebra yet, then the *Notation and Simple Matrix Algebra* section will be very helpful to you (along with RM section 2.11).
- ISL Ch 2 - don't get bogged down in formulas, the vocabulary and English definitions are more important at this point
  - ISL Ch 2 # 1, 2, 8-10 (especially 8c, 9c-9f)
- ISL Ch 4 intro, 4.1-4.2, intro to 4.3, intro to 4.4, 4.5
- ISL Ch 10 intro and 10.1
- AG Supplementary Topics/Statistical Learning Methods (problems that focus on the types of statistical tools in supervised and unsupervised learning, when they can be used, and what they are useful for doing)

## Linear Models

Read/work the following.

- Background and intro to simple linear regression
  - ISL Ch 3 Intro
  - RM Ch 1, # 1.1, 1.2, 1.5
  - RM Ch 2, # 2.1, 2.4, 2.8, 2.9, 2.10, 2.19, 2.20, 2.21
    ISL 3.1 (this is complementary to RM Ch 2, but presents information in a very different, more conversational way making it worth the time to also read)
  - AG (problems from the following sections that address simple linear regression)
    Normal Linear Model and Supplementary Topics/Exploratory Data Analysis
    Practice #1: Chapter 1, Simple Linear Regression Assignment
    Practice #3: Chapter 3, Model Diagnostics
- Multiple linear regression
  - RM Ch 3, # 3.4, 3.5, 3.6
    ISL 3.2-3.3 (also complementary)
  - RM Ch 4 # 4.3, 4.5, 4.6
    ISL 3.3 (also complementary)
  - AG (problems from the following sections that address multiple linear regression)
    Normal Linear Model and Supplementary Topics/Exploratory Data Analysis
    Practice #2: Chapter 2, Multiple Linear Regression Assignment
- Model Selection and Interpretation
  - RM Ch 5 # 5.3-5.4
  - RM Ch 6 # 6.1 (a-h), 6.2
  - AG (problems from the following sections that address linear regression)
    Normal Linear Model and Supplementary Topics/Exploratory Data Analysis
    Practice #3: Chapter 3, Model Diagnostics
    Practice #5: Chapter 5, Generalized Linear Model

## Time Series Models

Read/work the following.

- RM Ch 7 # 4.3
- FPP Ch 8 from section 11 work at least two out of # 6-10, and then review the entire solutions for # 6-11
- AG Time Series Models (problems consistent with the material discussed in class)
  Practice #6: Chapter 6, Fundamentals of Time Series Analysis
  Practice #7: Chapter 7, Time Series Forecasting