Section 6.4: Resampling Methods

Duration: 1 hour 45 mins

Concepts:
- The validation set approach
- Leave-one-out cross-validation
- K-fold cross-validation
- The bootstrap

Textbook section: An Introduction to Statistical Learning, Chapter 5

Materials and Resources	Learning Goals
● Computers for students with R Studio ● Resampling Methods Slides ● Resampling Methods Exercises R Markdown file	● Learn how to use cross-validation and the bootstrap to find the best model.

Duration	Lesson Section	Learning Objectives
8 mins	Go through the validation set approach of the slides.	● The validation set approach ● Drawbacks to this approach
15 mins	Go through “The Validation Set Approach” section in the R Markdown file as a class.	● Use the validation set approach for a linear model
5 mins	Go through the leave-one-out cross-validation section of the slides.	● Leave-one-out CV ● How is it better than the set approach
20 mins	Go through the leave-one-out cross-validation section in the R Markdown file as a class.	● Use `cvglm()` to perform LOOCV for a linear model. ● Use `cvglm()` to choose the best degree of polynomial to fit to the data
8 mins	Go through the k-fold cross-validation section of the slides.	● K-fold CV ● LOOCV vs k-fold CV
15 mins	Go through the k-fold cross-validation section in the R Markdown file as a class.	● Use `cv.glm()` to choose the best degree of polynomial to fit to the data using k-fold CV
8 mins	Go through the bootstrap section of the slides.	● The bootstrap
15 mins	Go through the bootstrap section in the R Markdown file as a class.	● Use `boot()` to find the SE of the mean of a data set ● Use `boot()` to find the SE of parameters from `lm()`