Module 4: Introduction to Multiple Linear Regression

Live Sessions	Office Hours	
July 20: 9:00 - 9:50 am EDT (Blue), 10:00 - 10:50 am EDT (Orange)	Tue & Thu: 9:00 - 9:50 am EDT (Blue), 10:00 - 10:50 am EDT (Orange).	 Dr. Woo yjw4b@virginia.edu

MODULE WELCOME

In modules 1 to 3, you learned about the simple linear regression model. Simple linear regression uses the term "simple," because it concerns the study of only one predictor variable with one response variable. We started with simple linear regression as it is much easier to visualize concepts in regression models in that setting.

In reality, there is usually more than one predictor variable in a regression setting. When that is so, we use the multiple linear regression (MLR) model. MLR models allow us to examine the effect of multiple predictors on the response variable simultaneously.

In this module, we will explore the multiple linear regression model as an extension of the simple linear regression model. We will also compare and contrast the multiple linear regression model with the simple linear regression model, and you will learn how to interpret model coefficients and results from hypothesis tests and confidence intervals.

At the end of this module, you will complete and submit an evaluation of your own participation and that of your group members in the small-group discussions of the guided question sets for modules 1, 2, 3, and 4.

ESSENTIAL QUESTIONS

- *How is the multiple linear regression model set up?*
- *How do we use a multiple linear regression model to assess the relationship between the response variable and the multiple predictors?*
- *How similar and different are the MLR and SLR models?*

LEARNING OBJECTIVES

1. Describe the setup of the multiple linear regression model.
2. Compare and contrast the multiple linear regression model with the simple linear regression model, especially in terms of interpreting model coefficients and results from hypothesis tests and confidence intervals.
3. Use a multiple linear regression model to answer questions regarding the relationship between a quantitative response variable and several predictors, and make predictions.
4. Describe what questions are addressed by the various confidence intervals and hypothesis tests in a multiple linear regression.
5. Given a data set and a question of interest, identify what inferential procedure to use in a multiple linear regression setting.
6. Assess the appropriateness of your multiple linear regression model for data analysis and apply remedial measures to address common problems in building regression models.

ASSIGNED RESOURCES

- *Introduction to Linear Regression Analysis*, Sections 3.1 to 3.3.2, 3.4, 3.5.
- Module 4 R tutorial, data set: delivery.txt, and R-code: tutorial_module 4.R
- Module 4 guided question set and data set: nfl.txt

OPTIONAL

Visit the Module 4 Discussion Forum to communicate with one another about the assigned readings and resources or to discuss any other topics of interest with your instructor or fellow students.

Module 4 General Discussion

MODULE OVERVIEW