

## Module 2: Inference with Simple Linear Regression

<b>Live Sessions</b> July 15: 9:00 - 9:50 am EDT (Blue), 10:00 - 10:50 am EDT (Orange)	<b>Office Hours</b> Tue & Thu: 9:00 - 9:50 am EDT (Blue), 10:00 - 10:50 am EDT (Orange).	 <b>Dr. Woo</b> yjw4b@virginia.edu
---	---	--

### MODULE WELCOME

In module 1, you explored the basics of the simple linear regression model and you were introduced to the ANOVA approach to the regression model. In completing module 1, you began to develop the skills necessary to interpret a simple linear regression model for a given data set.

In this module, you will learn how to account for random variation associated with the estimated regression model and interpret results from the estimated regression model in the face of random variation. To do this, you will explore the three kinds of confidence intervals and the two kinds of hypothesis tests associated with a simple linear regression.

### ESSENTIAL QUESTIONS

- How do we assess whether there is a statistically significant linear relationship between the predictor and response variables?
- How do we estimate the mean value of the response variable for a specific value of the predictor variable?
- How do we predict the value of the response variable for a specific value of the predictor variable?

### LEARNING OBJECTIVES


- Describe what questions are addressed by the various confidence intervals and hypothesis tests in a simple linear regression.
- Given a data set and a question of interest, identify what inferential procedure to use in a simple linear regression setting.

### ASSIGNED RESOURCES









- Introduction to Linear Regression Analysis, Sections 2.3 to 2.5
- Video: Deming's Red Bead Experiment
- Module 2 R tutorial, data set: purity.txt, and R-code: tutorial\_module 2.R
- Module 2 guided question set and data set: bp.txt

### OPTIONAL

Visit the Module 2 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 2 General Discussion](#)

### MODULE OVERVIEW

-  [2.1: Introduction to the Lesson](#)
-  [2.2: Hypothesis Testing in Simple Linear Regression \(SLR\)](#)
-  [2.3: Confidence Interval of the Slope](#)
-  [2.4: Confidence Interval of the Mean Response](#)
-  [2.5: Prediction Interval of a New Response](#)
-  [2.6: Recap of Module 2](#)
-  [2.7: R Tutorial for Module 2](#)
-  [2.8: Module 2 Live Session](#)