


Module 10: Logistic Regression Part Two

Live Sessions Aug 3: 9:00 - 9:50 am EDT (Blue), 10:00 - 10:50 am EDT (Orange)	Office Hours Tue & Thu: 9:00 - 9:50 am EDT (Blue), 10:00 - 10:50 am EDT (Orange).	 Dr. Woo yjw4b@virginia.edu
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MODULE WELCOME

In the previous module, you learned about the logistic regression model. Recall that logistic regression is used when the response variable is binary (categorical with two outcomes) and there is at least one predictor.

In this module, you will learn how to use the Receiver Operating Characteristic (ROC) curve and the Area under the ROC Curve (AUC) to assess how well your logistic regression model performs in classifying outcomes. You will also learn about the multinomial logistic regression model, which is used when the response variable is categorical with more than two outcomes. Finally, you will learn about Generalized Linear Models (GLMs). The linear regression and logistic regression models you have learned so far are specific kinds of GLMs.

ESSENTIAL QUESTIONS

- *How do we assess the classifying ability of a logistic regression model?*
- *How do we interpret the coefficients of a multinomial logistic regression model?*
- *What kind of hypothesis tests can we perform on a Generalized Linear Model?*

LEARNING OBJECTIVES

- 1 Validate a logistic regression model using an ROC curve and the AUC.
- 2 Describe the setup of a multinomial logistic regression model, interpret the model, and carry out various inferential procedures to answer questions of interest.
- 3 Describe the setup of Generalized Linear Models and explain how the linear, logistic, and Poisson regression models are special cases.

ASSIGNED RESOURCES








- *Introduction to Linear Regression Analysis*, Sections 13.2.7 and 13.4 to 13.4.3
- Reading: ROC Curve (PDF)
- Module 10 R tutorial, data set: titanic.txt, data set: contraceptive.txt, and R-code: tutorial_module 10.R
- Module 10 guided question set, data set: wcgs.csv

OPTIONAL

Visit the Module 10 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 10 General Discussion](#)

MODULE OVERVIEW

-  [10.1: Introduction to the Lesson](#)
-  [10.2: Logistic Regression Validation](#)
-  [10.3: Multinomial Logistic Regression](#)
-  [10.4: Generalized Linear Models \(GLMs\)](#)
-  [10.5: Recap for Module 10](#)
-  [10.6: R Tutorial for Module 10](#)
-  [10.7: Module 10 Live Lesson](#)