CUNY School of Professional Studies

DATA 621 Business Analytics and Data Mining

CUNY SPS Master of Science in Data Science

Fall 2021

Instructor Name: Nasrin Khansari
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Class Meetup:
Office Hours:
Degree Program: M.S. in Data Science
Credits: 3 graduate credits
Prerequisites: None
Type of Course: Required course

Course Description

This course develops the foundations of predictive modeling by introducing the key concepts of applied regression modeling and its extensions. The main topics covered in this course include: simple and multiple linear regression, variable selection and shrinkage methods, binary logistic regression, count regression, weighted least squares, robust regression, generalized least squares, multinomial logistic regression, generalized linear models, panel regression, and nonparametric regression. The course is heavily weighted towards practical application using the R statistical programming language and data sets containing missing values and outliers. The course also addresses issues of exploratory data analysis, data preparation, model development, model validation, and model deployment

Course Learning Outcomes:

• Demonstrate a practical understanding of the theoretical concepts behind applied regression modeling. • Analyze and select appropriate types and combinations of models given particular business situations. • Develop applied regression modeling techniques to address different types of data. • Use R statistical software to build and deploy specific models based on real-world business problems.

Program Learning Outcomes addressed by the course:

• Business Understanding. Students will learn how applied regression modeling techniques can add value to existing business analytics. • Data Programming. Use industry standard statistical programming tools. • Foundational Math and Statistics. Emphasis on probability, statistics, and computational methods. • Data Culture. Students will learn how applied regression modeling can enhance business capabilities and extend the value of existing data. • Data Understanding. Students will learn how to explore data to find new patterns. • Predictive Modeling. Selecting predictive modeling techniques, building and assessing models. • Model Implementation. Students will learn to implement models for the various applied regression modeling techniques covered in the course

How is this course relevant for data analytics professionals?

Regression modeling skills are crucial, high-value skills in today's data-driven business environment where real-world decision-making processes are complex. The ability to leverage rapidly expanding data sets to obtain new insights is at the heart of predictive data analytics.

Grading

Grade Distribution

Quality of Performance	Letter Grade	Range %	GPA
Excellent - work is of exceptional quality	A	93 - 100	4
Excellent	A-	90 - 92.9	3.7
Good - work is above average	B+	87 - 89.9	3.3
Satisfactory	B	83 - 86.9	3
Below Average	B-	80 - 82.9	2.7
Poor	C+	77 - 79.9	2.3
Poor	C	70 - 76.9	2
Failure	F	< 70	0

Schedule

Note: Schedule is subject to change.

Dates	Topic
Aug-25 to Sep-05	Introduction to Applied Regression Modeling
Sep-06 to Sep-12	Simple Linear Regression Estimation
Sep-13 to Sep-19	Simple Linear Regression: Inference Prediction
Sep-20 to Sep-26	Simple Linear Regression: Explanation Diagnostics and Transformation
Sep-27 to Oct-03	Multiple Linear Regression and Missing Data
Oct-04 to Oct-10	Multiple Linear Regression: Model Diagnostics and transformations
Oct-11 to Oct-17	Variable Selection and Shrinkage Methods
Oct-18 to Oct-24	Binary Logistic Regression
Oct-25 to Oct-31	Count Regression
Nov-01 to Nov-07	Weighted Least Squares and Robust Regression
Nov-08 to Nov-14	Generalized Least Squares
Nov-15 to Nov-28	Multinomial Logistic Regression
Dec-06 to Dec-13	Generalized Linear Models
	Panel Regression: Repeated Measure and Longitudinal Data
	Nonparametric regression
	NONE

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