Topics in Statistics: Multivariate Sports Analytics

Stat 306

Spring 2024

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Office Hours

- 1:00 - 2:00 on Monday, Wednesday, and Friday
- 2:00 - 4:00 on Tuseday, (sign up for an appointment)
- If these hours are not convenient, please don't hesitate to contact me to set up an appointment.

Textbook

Boekmke, B. and Greenwell, B. (2020), Hands-On Machine Learning with R, CRC Press, Taylor & Francis Group

Supplemental Text

Baumer, Benjamin S., Kaplan, Daniel T., and Horton, Nicholas J. (2021), Modern Data Science with R, CRC Press, Taylor & Francis Group

Goals

- Introduce statistical models and methods for decision making in sports
- Introduce statistical software
- Increase awareness of professional literature regarding sports analytics
- Encourage appropriate use of data analytics and data mining techniques
- Foster productive work habits with peers, including joint presentations and assignments

Accessibility Accomodations

A student who thinks they may need an accommodation to access a campus program, activity, or service should contact Ruthann Daniel Harteis in Student Accessibility and Support Services (SASS) at danielharteis1@kenyon.edu to discuss specific needs. Advance notice is required to review documentation, evaluate accommodation requests and provide notice or arrangements for any accommodation.

Title IX Responsibilities

As a member of the Kenyon College faculty, I am concerned about the well-being and development of students, and am available to discuss any concerns. However, I want you to know that faculty members are legally obligated to share certain information with the College's Civil Rights & Title IX Coordinator. This requirement is to ensure your safety and welfare is being addressed. These disclosures include, but are not limited to: reports of discrimination or harassment due to a protected characteristic, including sexual harassment, sexual assault, relational/domestic violence, and stalking.

Statistical Package and Computing

The R statistical software package will be used throughout the course. Assignments and course announcements will be sent to you via e-mail or posted on the course web page. Data sets, R scripts, and R Markdown files will be placed in our Google drive folder Stat306-SportsAnalytics-S2024. Proper maintenance of computer accounts, files, etc. is your responsibility. I recommend that you back up your data sets, worksheets, and R scripts on a regular basis. I will not assume you have prior experience with statistical software so you do not need to be concerned about the use of technology in the classroom. R is free and you may download and use it on your own personal machine.

Our class will follow a seminar style, so your participation in class discussions is essential for success in this course. R statistical software will be used extensively throughout the course, but you may not have much time to work on scripts and Markdown files during regular class hours. Group assignments will be a regular part of your work.

Weekly Assignments: reading professional journal articles, preparing presentations, and activities

Weekly assignments will be given throughout the semester. Subsets of these assignments will be collected and graded. Peer assessment will also be used to provide feedback on papers, presentations, progress reports, and other assignments.

The best way to improve your proficiency with R is to write programs. Comparing and contrasting different models and analyses will be a regular part of your work. Professional journal articles will be used rather than a tradition text. Your opinions on the views of the claims made by authors must be defended with appropriate data and analysis. Our goal is to improve your technical communication skills, both oral and written.

Late Policy

Assignments must be turned in at the beginning of the class period on the assigned due date. **No credit** will be given for late papers. If for any reason you cannot turn in your paper on the assigned date, you must contact me before class. If you are unable to contact me, you can leave a voice mail or send an e-mail message to hartlaub@kenyon.edu.

Attendance Policy:

In relation to the Kenyon Class Attendance Policy and The Department of Mathematics and Statistics Attendance Policy, nine class absences (whether excused or unexcused) will result in expulsion from the course.

Exams

There will be no exams in this course.

Final Project

Each student will find a journal article, supporting data set and apply an appropriate statistical analysis. The variables in the data set and the purpose of the study must be clearly defined. If the data are obtained from a periodical, the date of publication must be later than January 1, 2020. Summaries of your proposed analysis must be submitted on or before Friday, April 26. Final papers explaining the problem of interest, your analysis, and your conclusions must be submitted on or before Tuesday, May 7 at 6:30 pm. A short presentation to the class, perhaps in the form of a poster session, will also be required.

Group Projects and Presentations

You will be responsible for preparing and delivering presentations to the class. Some of these presentations may be traditional presentations with PPT (or other slides) and others will be in debate, poster, paper, or podcast format. Our goal is to refine your ability to summarize your position on technical issues succinctly. You may work with one or two of your peers on these group presentations.

Grades

Your course grade will be based on your overall percentage. The categories used to determine your overall percentage are listed below with their respective weights.

- Weekly Assignments - 15%
- Class presentations and peer reviews - 15%
- Group projects - 45%
- Final Project - 25%

Class participation will be used to help make borderline decisons.