Birmingham-Southern College

CAC E299 - 02: Big Data Analytics: Exploring NBA Athletic Data

Course Description

In this engaging E-Term project, students will explore the basics of big data analytics - the strategy of analyzing large volumes of data - with machine learning and examine how this combination helps find patterns and results otherwise unnoticed. Students will be expected to use critical thinking and tools such as Python, Jupyter Notebook, and Pandas in order to gather, clean, transform, model, and interpret NBA data. Project evaluation will be based on class attendance, active participation, reading assignments with related quizzes, and a final project focusing on modeling of NBA player trends. Come explore and discuss big data with us!

Professor Information

Dr. Anthony Winchester
Office: Olin 209
Email: agwinche@bsc.edu
Meeting Times:
MTWTH 9:00 am – 12:00 pm
Location: Olin 201
Office Hours:
Monday – 2:00 pm – 4:30 pm
Wednesday – 2:00 pm – 4:30 pm
Or by appointment: Virtual Zoom

Course Website

All course information will be posted on Moodle including assignments, readings, quizzes, and other important dates. Please be sure to check your courses on Moodle frequently to keep up with due dates and notes.

Textbook: N/A

Tentative Course Outline/Important Dates
Outline is subject to change.

Date	Topic	Readings (to be completed prior to class)	Assignments (to be completed after class)
Week 1	Intro to Course Syllabus (Examining Anaconda and Getting Familiar with Python)	N/A	Assigned in class
Week 2	Examining the Relationships between Features and the Response	N/A	Assigned in class
Week 3	Estimating the Coefficients and Intercepts of Logistic Regression	N/A	Assigned in class
Week 4	Decision trees	N/A	Assigned in class

Important Dates

Thursday, January 7	**Last Day to Drop without a Grade or Add Exploration-Term Project***
Friday, January 15	**Last Day to Drop Exploration-Term Project with Grade of "W"***
Monday, January 18	**MLK Day: no class meetings**
Thursday, January 28	**E-Term showcase kick-off by fountain (details to follow at a later date)**
Friday, January 29	**Last day of term**
Tuesday, February 9	**E-Term grades available**

Assessment

Weekly Assignments	70%
Final Project	30%

Major/Program Learning Outcomes
At the conclusion of the semester, students will be able to
1. Organize and Manipulate data
2. Write code for computational problems
3. Optimize alternative computational approaches for enhancing the creation and presentation of raw material

Course Outcomes	Assessment Methods/Metrics
Students will learn to analyze the effects of computation including the impacts of computing, the connection between people and computing, and the connection between fundamental computing concepts.	Students will research how CS impacts an area of interest. Students will also perform an exam including these topics.
Students work in teams to develop the project, gather and study appropriate resources (references) for understanding the project's application domain, and demonstrate the project's utility to the instructor and peers	Operate in teams to develop the project, acquire and use resources (references) pertaining to the project's application domain, and demonstrate the project's functionality.
Students will demonstrate a solid understanding of abstraction in the context of languages as well as models.	Students will complete an assignment to research a computer model and explain how it works, what abstraction means, and why models and abstraction are beneficial to use a model. An exam will be given to further evaluate the students' understanding.
Students have a good understanding of topics pertaining to professional, ethical and social aspects of the software engineer's job and activities.	Discuss topics pertaining to professional, ethical and social aspects of the software engineer's job and activities.
Students create individual projects to include design elements (pseudocode and flowcharts). Additionally, students will be able to demonstrate problem solving and troubleshooting abilities.	Complete three individual projects to express an understanding of algorithmic logic and identifying errors and solutions to given problems.
Students will learn how to work with large data sets.	Students will use a database in conjunction with an individual programming assignment in addition to evaluating how models utilize data in a second individual assignment.

Moodle Learning Management System

Students are responsible for checking Moodle for course readings, assignments, and announcements. Work that is passed in late because of not checking Moodle is the

responsibility of the student. You are also required to check your grades on Moodle to verify that the correct grades are recorded for your completed work.
It is expected all written assignment to be saved and submitted on Moodle as a PDF.

Programming Assignments
Programming assignments must provide user with clear instructions for testing of the code. Use of the web is limited to gaining understanding of concepts, examples of topics and use of concepts. Direct re-transcribing/copy and pasting of answers of the code is unacceptable. All programming assignments will be submitted through the Anaconda platform. I reserve the right to ask questions about the program you have developed. This is to verify your understanding. Assignments are to submitted in .py format.

Programing Rubrics

Category	Points
Primary concept being evaluated (input/output, variable, conversions, decision statements, loops)	30
Program runs without an error	30
Prompts are clear (user knows what to do once program starts)	15
Program runs as problems dictates	15
Program is well Commented	10

Late Submission
Loss of 5 points will occur due to late submission of assignments.

Accommodations
If you are registered for accommodations/ academic adjustments, please make an appointment with me as soon as possible to discuss accommodations/ academic adjustments that may be necessary. During this discussion, you are not expected to disclose any details concerning your disability, though you may discuss these details at your discretion. If you have a disability but have not contacted Angie Smith, the Coordinator of Accessibility at BSC, please call 205-226- 7909 or visit Counseling and Health Services on the second floor of Norton Center to initiate the process. You may also contact her at awsmith@bsc.edu if you have any questions or need more information. Her office hours are Mondays – Fridays 8: 30 – 4:30. An appointment is recommended.

BSC 's Academic Resource Center (ARC)

The Academic Resource Center (ARC), located on the ground floor of the Library, offers drop-in tutoring and one-on-one assistance for all BSC students. We offer assistance in Accounting, Arabic, Biology, Business, Chemistry, Chinese, Economics, History, Latin, Marketing, Music Theory, Philosophy, Physics, Physiology, Political Science, Psychology, Religion, Sociology, Spanish, and Statistics. Peer tutoring is free and tutors spend an hour or more per one-on-one appointment, and there is no limit to the number of tutoring sessions you can have. Also feel free to stop by during regular drop-in hours (Monday-Thurs, 7- 9 p.m. for assistance without an appointment). For more information or to make an appointment email arc@bsc.edu or visit the Academic Resource Center web page and submit a form. Reach out to us, we can help!

BSC Resources for Writers

The Writing Center is located in Humanities 102, and it has a new structure and vibe this year. Two graduate student coordinators will be on site at all times. The Writing Center is open to supervise peer tutors and to conduct tutorials themselves, as needed. We will be open Sunday-Thursday late afternoon and evenings, and students do not need an appointment. Tutorials are about 30 minutes long, free of charge, and available on a drop-in basis. Tutors will not proofread or "fix" student papers. They will provide one-on-one consultation about writing issues--small and large--for any student from any major at any point in the writing process. There is no limit to how many tutorials a student may attend. We are here to help!

Title IX

Birmingham-Southern College is committed to providing a safe and comfortable learning, living, and working environment for all students, faculty, staff, and campus visitors, free from harassment based on race, color, national origin, ethnic origin, gender, sexual orientation, age, disability, genetic information, or veteran status. BSC will not tolerate and will take action against any individual who seeks to engage in harassing behavior. Any student, faculty, or staff member who has concerns about gender discrimination or sexual harassment, sexual assault, or sexual violence is encouraged to seek the assistance of the Title IX Coordinator or other individuals at the College they may be comfortable disclosing to for support assistance.

Academic Integrity

Adhere to the honor code at all times: As a member of the student body of Birmingham-Southern College, I recognize my responsibility to the traditions of the institution, to my fellow students and to myself. I recognize the significance of the honor system. I pledge that I have read and understand the Constitution of the Honor Council, including the Honor Code, and agree to be bound by its provisions.

COVID-19

There will be assigned seating to ensure an organized arrangement. Students should maintain a distance of 6 feet while wearing a mask. Students are to display positive health tracker feedback at the beginning of class.