Course Description	
COURSE NUMBER and NAME	DATA 630 Artificial Intelligence & Prescriptive Analytics in Business
UNITS	3
LENGTH OF CLASS	8 Weeks
COURSE DESCRIPTION	In this course, students learn to apply artificial intelligence (AI) and prescriptive analytics to solve real-world business problems. Students who enroll in this course should be familiar with descriptive statistics and have experience working with data in a spreadsheet (i.e. Excel). Working knowledge of SQL and Tableau is a plus but not required. Data wrangling is at the core of all data activity. In this course, students learn how to work with different data types, dirty data, and outliers. They also learn how to reformat data and join data from different sources together.
REQUIRED TEXT	None. Materials are provided in each week of the class.
INSTRUCTIONAL METHOD	Online / On-Campus

Summary of Graded Work and Assessments

Graded work and assessments offer students the opportunity to show the degree of mastery for each CLO. The following table shows how assessments and CLOs align (link).

Assignments	Totals	Weight	CLOs
Engagement and Professionalism: Live Class Activities (Rubric)	160	16%	1, 2, 3, 4, 5, 6, 7, 8
Week 1 Assignment	100	10%	1
Week 2 Discussion	50	5%	2
Week 3 Assignment	100	10%	3
Week 4 Discussion	50	5%	4
Week 5 Assignment	100	10%	5
Week 6 Discussion	50	5%	6
Week 7 Discussion	50	5%	7
Week 7 Final Assignment	190	19%	8

Assignments	Totals	Weight	CLOs
Week 8 Discussion	50	5%	8
Week 8 Final Assignment Presentations	100	10%	8
Total Points/Percentage	**1000 Points**	**100%**	

Course Policies

For Westcliff's course policies, please see the Course Policies document.

Discussion Requirements

For all discussions, the primary response is due by Thursday at 11:59 p.m. Pacific Time. The primary response must be at least 200 words in length and fully address the topic, demonstrating critical thinking and understanding. Each student must then also post a minimum of two responses to other students in the discussion by Sunday night at 11:59 p.m. Pacific Time. Each peer response must be at least 50 words in length and substantively engage with the other student's original post, continuing the discussion in a professional manner. If at any time information or material is brought in from an outside source or website, it must be properly cited following APA 7th edition guidelines and a full reference must be provided.

Assignment Requirements

Each assignment deliverable is specifically defined in the assignment instructions, such as page length, citations and references, audio or video, presentations, tables, etc. For all written assignments, the required page length does not include the cover or references pages. Refer to the specific requirements as stated in each assignment, and reach out to your instructor for additional information as needed. All graded submissions are due by Sunday at 11:59 p.m. Pacific Time.

All written work must adhere to APA 7th edition academic formatting requirements including core components such as the cover page, page numbers, headings, citations, 1" margins, paragraph indentations, left alignment, double spacing throughout, and the final references using hanging indents.

Participation Requirements

Students are required to attend each live class session either in person or virtually as stipulated in the course policies. Participation in the live class session is determined by actively engaging, answering or asking questions, providing comments, interacting in group activities, etc., as required by the instructor. Students who are unable to attend the live in-class or virtual sessions must follow the VCS submission requirements as stated in the Course Policies document.

Writing Center

The Westcliff University Writing Center is dedicated to providing quality support to students and faculty. From assignment review, to in-class workshops, to dissertation support, to publication help, the Writing Center is committed to empowering individuals to use the written language to articulate and disseminate knowledge.

Course Learning Outcomes (CLOs)

Learning outcomes are statements that describe significant and essential scholarship that students have achieved and can reliably demonstrate at the end of the course. Learning outcomes identify what the learner will know and be able to do by the end of a course – the essential and enduring knowledge, abilities (skills), and attitudes (values, dispositions) that constitute the integrated learning needed for successful completion of this course. The learning outcomes for this course summarize what students can expect to learn, and how this course is tied directly to the educational outcomes of the degree.

Course Learning Outcomes (CLOs)	PLOs
1. Understand the fundamentals of AI and prescriptive analytics and their applications in business decision-making.	4
2. Master data wrangling and preprocessing techniques for preparing data in AI and prescriptive analytics applications.	4, 5
3. Develop skills in descriptive statistics and data visualization for effective data analysis and communication.	4, 5
4. Understanding of the foundations of predictive analytics, machine learning, and their role in AI and prescriptive analytics.	4, 5
5. Use optimization techniques in prescriptive analytics for effective decision-making and resource allocation.	1, 4, 5
6. Analyze real-world case studies to understand the practical applications of AI and prescriptive analytics in solving business problems.	3
7. Demonstrate experience in integrating data from multiple sources for AI and prescriptive analytics applications.	4, 5
8. Develop a final project presentation and reflect on future trends in AI and prescriptive analytics.	2

Detailed Course Outline

The following outline provides important assignment details for this course, unit by unit. Students are responsible for all of the assignments given. Please refer to the Detailed Description of Each Grading Criteria in the syllabus for specific information about each assignment.

Week 1: Introduction to Artificial Intelligence and Prescriptive Analytics in Business

Assignments to complete this week:

- Readings
  - eBook:
    - AI in the enterprise: Unleashing opportunity through data
  - Article:
    - Prescriptive Analytics: Optimize Business Decisions in 2023
  - Video:
    - Descriptive, Predictive, & Prescriptive Analytics

Week 1 Live Class Activity

Group Brainstorm - Identifying Potential Business Problems for AI and Prescriptive Analytics Solutions

Objective

The objective of this in-class activity is to encourage students to think creatively and collaboratively about the applications of AI and prescriptive analytics in solving real-world business problems.

Instructions

1. Form small groups, as determined by the instructor. (The instructor will assign each group a specific industry or business domain (e.g., healthcare, retail, finance, manufacturing, marketing, human resources).)
2. Identify 2-3 potential business problems within your group's assigned industry or domain that could benefit from AI and prescriptive analytics solutions.
3. Consider the following questions while brainstorming:
   a. What are the main challenges and pain points in the industry/domain?
   b. How can AI technologies, such as machine learning, natural language processing, or computer vision, be applied to address these challenges?
   c. What types of data might be needed to develop a prescriptive analytics solution for these problems?
   d. What might be some potential benefits or outcomes of implementing an AI and prescriptive analytics solution for these problems?
4. Take 15-20 minutes to discuss and generate ideas.
5. Present your identified business problems and potential AI and prescriptive analytics solutions to the class. Encourage other students to ask questions and provide feedback on the presented ideas.
6. Discuss as a class common themes, challenges, and opportunities that emerged from the group presentations. Highlight the importance of interdisciplinary knowledge,

collaboration, and innovation in developing and implementing AI and prescriptive analytics solutions in business.

Outcomes
This in-class activity helps students understand the wide range of possibilities for AI and prescriptive analytics in various industries and domains. By working in groups, students practice their communication, collaboration, and critical thinking skills.

Week 1 Assignment (Rubric)

This assignment helps students develop a deeper understanding of the role of AI and prescriptive analytics in modern business decision-making. This assignment encourages students to think critically about the readings and class discussions and synthesize their knowledge in a coherent manner.

Instructions
In 500-750 words (2-3 pages), write an essay explaining the role of AI and prescriptive analytics in modern business-decision making with the following components:

1. Introduction: Briefly introduce the concepts of artificial intelligence (AI) and prescriptive analytics. Explain their relevance to modern business decision-making.
2. AI in Business: Describe how AI technologies, such as machine learning, natural language processing, and computer vision, are being used to improve decision-making in various industries. Provide specific examples to illustrate the applications of AI in solving real-world business problems.
3. Prescriptive Analytics: Explain the concept of prescriptive analytics and how it differs from descriptive and predictive analytics. Discuss the benefits of using prescriptive analytics in decision-making, including its ability to optimize processes, resources, and outcomes. Provide examples of prescriptive analytics use cases in business.
4. Synergy between AI and Prescriptive Analytics: Discuss how AI and prescriptive analytics can complement each other in solving business problems. Explain how AI can enhance the effectiveness of prescriptive analytics by enabling more accurate predictions, automating complex processes, and incorporating unstructured data.
5. Challenges and Future Trends: Briefly address the potential challenges businesses may face when implementing AI and prescriptive analytics solutions, such as data quality, privacy concerns, and ethical considerations. Mention emerging trends and technologies that could shape the future of AI and prescriptive analytics in business.
6. Conclusion: Summarize the main points discussed in the essay and emphasize the importance of AI and prescriptive analytics in modern business decision-making.

Week 2: Data Wrangling Basics

Assignments to complete this week:

- Readings:
  - Articles:
    - Data Wrangling in 6 Steps
    - 4 Types of Data
    - Guide To Data Cleaning: Definition, Benefits, Components, And How To Clean Your Data

Week 2 Live Class Activity

Hands-on data wrangling exercise using Excel or Google Sheets.

Objective

This in-class activity provides students with a practical, hands-on experience in data cleaning and preprocessing using various techniques and tools. Students work together to identify and resolve data quality issues, reinforcing the concepts discussed in class and preparing them for the data cleaning assignment.

Instructions

1. Form small groups, as determined by the instructor.
2. Using Google's dataset search (https://datasetsearch.research.google.com/) search for a dataset to work with for this activity.
3. Clean and preprocess the chosen dataset using the techniques discussed in class, such as handling missing values, detecting and handling outliers, correcting inconsistencies, and reformatting and transforming data.
4. Discuss and collaborate on your data cleaning and preprocessing decisions, considering the potential impact on the quality and interpretability of the data.
5. Take 30-45 minutes to work on your dataset. (During this time, the instructor circulates among the groups answering questions, providing guidance, and facilitating discussion.)
6. Briefly present your group's cleaned and preprocessed dataset to the class, explaining the data cleaning and preprocessing steps you took, the rationale behind each step, and any challenges you encountered.
7. As a class, discuss the different approaches taken by each group, the potential trade-offs involved in their data cleaning decisions, and any lessons learned from the activity.

Outcomes

This in-class activity helps students develop practical skills in data cleaning and preprocessing, which are essential for working with real-world data in AI and prescriptive analytics applications. By working in groups, students practice their communication, collaboration, and problem-solving skills.

Week 2 Discussion (Rubric)

Why is data quality crucial in AI and prescriptive analytics, and what are some of the key challenges and trade-offs faced during the data cleaning and preprocessing process? Share your thoughts on the potential consequences of poor data quality on the performance of AI and prescriptive analytics models, as well as possible strategies to overcome these challenges.

Week 3: Data Transformation and Feature Engineering

Assignments to complete this week:

- Reading:
  - Google:
    - Data Preparation and Feature Engineering in ML

Week 3 Live Class Activity

Hands-on feature engineering exercise using a sample dataset.

Objective

This in-class activity provides students with hands-on experience in feature engineering, an essential step in the machine learning pipeline. Students work with a sample dataset to create, select, and transform features, reinforcing the concepts discussed in class and preparing them for the feature engineering assignment.

Instructions

1. Form small groups, as determined by the instructor.
2. Using Google's dataset search (https://datasetsearch.research.google.com/) search for a dataset to work with for this activity.
3. Conduct feature engineering on the dataset, including the following steps:
   a. Feature Creation: Identify new features that could be derived from the existing data, such as interactions between variables, aggregation of data points, or calculation of ratios or percentages. Discuss the potential relevance and value of these new features for the predictive analytics or machine learning task at hand.
   b. Feature Selection: Evaluate the importance and relevance of each feature in the dataset (including the newly created features) using various feature selection techniques, such as correlation analysis, mutual information, or recursive feature elimination. Discuss the rationale behind your feature selection decisions and the potential trade-offs involved in including or excluding certain features.
   c. Feature Transformation: Apply appropriate feature transformation techniques to the selected features, such as scaling, normalization, or encoding of categorical variables. Discuss the rationale behind their feature transformation decisions and the potential impact on the performance of the predictive analytics or machine learning model.
4. Discuss and collaborate on your feature engineering decisions, considering the potential impact on the quality, interpretability, and predictive power of their features, as well as any potential trade-offs or challenges.
5. Take 30-45 minutes to work on your group's dataset. (During this time, the instructor circulates among the groups, answering questions, providing guidance, and facilitating discussion.)
6. After the exercise, briefly present your group's feature engineering process and decisions to the class, explaining the rationale behind your choices, any interesting insights you discovered, and any challenges you encountered.

7. As a class, discuss the different approaches taken by each group, the effectiveness of their feature engineering strategies, and any lessons learned from the activity.

Outcomes
This in-class activity helps students develop practical skills in feature engineering, which is an essential step in the machine learning pipeline. By working in groups, students practice their communication, collaboration, and problem-solving skills.

Week 3 Assignment (Rubric)

This assignment provides students with hands-on experience in using descriptive statistics and data visualization techniques to analyze and interpret a given dataset and to effectively communicate their insights and findings to a non-technical audience.

Instructions
Transform and engineer features on a provided dataset, then write a brief report on the process and rationale behind your choices.

1. Dataset: You are provided with a dataset relevant to a specific industry or business domain (e.g., retail, healthcare, finance).
2. Tools: You may use your preferred tools or programming languages (e.g., Excel, Google Sheets, Python, R, Tableau) to analyze the data and create visualizations.
3. Assignment Requirements:
    a. Descriptive Statistics: Compute relevant descriptive statistics (e.g., mean, median, mode, standard deviation, correlation) for the dataset to summarize the main features and relationships between variables.
    b. Data Visualization: Create a series of data visualizations (e.g., bar charts, line charts, scatter plots, heat maps) to explore patterns, trends, and relationships in the dataset. Choose appropriate visualization techniques based on the nature of the data and the insights you aim to convey.
    c. Interpretation and Analysis: Analyze the descriptive statistics and data visualizations to draw meaningful insights and conclusions about the dataset. Discuss any interesting patterns, trends, or relationships that you have discovered, as well as their potential implications for the industry or business domain in question.
    d. Communication: Prepare a brief presentation (10-15 slides) that clearly communicates your findings and insights to a non-technical audience. Use clear, concise language and visually appealing graphics to convey your message.
4. Submission:
    a. Submit your presentation, along with any supporting materials (e.g., code, spreadsheets, Tableau workbooks) used in the analysis and visualization process.
    b. Include a brief explanation of the data visualization techniques you used, the rationale behind your choices, and any challenges or limitations you encountered during the process.

Week 4: Data Visualization and Exploratory Data Analysis

Assignments to complete this week:

- Readings:
  - Article:
    - The Importance of Data Visualization in Business Analytics
  - Videos:
    - Introduction to Exploratory Data Analysis (EDA)
    - Data Visualization Tools: Tableau, Power BI, and Others

Week 4 Live Class Activity

Hands-on data visualization and EDA exercise using Tableau or an alternative tool.

Objective

This in-class activity provides students with hands-on experience in creating data visualizations and conducting exploratory data analysis (EDA) using a tool like Tableau or an alternative data visualization tool. Students work with a given dataset to explore patterns, trends, and relationships, reinforcing the concepts discussed in class and preparing them for the data visualization assignment.

Instructions

1. Form small groups, as determined by the instructor.
2. Using Google's dataset search (https://datasetsearch.research.google.com/) search for a dataset to work with for this activity. (The instructor introduces students to the data visualization tool they are to use for this activity (e.g., Tableau, Google Data Studio, Power BI, Python, R). The instructor may provide a brief tutorial or demonstration to help students familiarize themselves with the tool.)
3. Create a series of data visualizations to explore patterns, trends, and relationships in the dataset. Use various visualization techniques (e.g., bar charts, line charts, scatter plots, heat maps) based on the nature of the data and the insights you aim to convey.
4. Discuss and collaborate on your data visualization decisions, considering the effectiveness, clarity, and aesthetics of your group's visualizations, as well as any potential trade-offs or limitations of the techniques they choose.
5. Take 30-45 minutes to work on your group's dataset. (During this time, the instructor circulates among the groups, answering questions, providing guidance, and facilitating discussion.)
6. After the exercise, briefly present your group's data visualizations to the class, explaining the techniques you used, the rationale behind your choices, any interesting insights you discovered, and any challenges you encountered.
7. As a class, discuss the different approaches taken by each group, the effectiveness of their data visualizations, and any lessons learned from the activity.

Outcomes

This in-class activity helps students gain hands-on experience in creating data visualizations and conducting exploratory data analysis (EDA) using a tool like Tableau or an alternative data visualization tool. By working in groups and presenting their findings, students practice their research, communication, and collaboration skills.

Week 4 Discussion (Rubric)

Share an example of an insightful data visualization you've seen or created. What made it effective? Consider aspects such as clarity, aesthetics, simplicity, and the ability to communicate complex information or insights.

Week 5: Introduction to Machine Learning for Business Applications

Assignments to complete this week:

- Reading:
  - Google:
    - Overview of Machine Learning Techniques and Algorithms
  - Video:
    - Model Evaluation and Selection

Week 5 Live Class Activity

Objective

This in-class activity encourages students to explore and understand the practical applications of various machine learning techniques in business. Students work in groups to discuss and present use cases for different machine learning techniques, reinforcing the concepts discussed in class and preparing them for the AI and machine learning assignments.

Instructions

1. Form small groups, as determined by the instructor. (Each group is assigned a specific machine learning technique to focus on, such as linear regression, logistic regression, decision trees, random forests, support vector machines, clustering, or neural networks.)
2. Research and discuss practical use cases for your assigned machine learning technique in the context of business decision-making. Consider the following points:
   a. What types of business problems or decisions can be addressed using the assigned machine learning technique? Consider various industries and business domains (e.g., marketing, finance, operations, human resources).
   b. What are the key advantages and limitations of the assigned machine learning technique in addressing these problems or decisions? Discuss factors such as interpretability, scalability, accuracy, and the ability to handle different types of data or relationships.
   c. Share examples or case studies of successful applications of the assigned machine learning technique in business. Consider the specific factors or conditions that contributed to the success of these applications, as well as any lessons learned or best practices.
3. Take 30-45 minutes to research, discuss, and prepare a brief presentation on your group's assigned machine learning technique and its use cases in business.
4. Present your group's findings to the class, covering the points mentioned above and any additional insights or reflections.
5. As a class, discuss the different machine learning techniques and their practical applications in business decision-making, as well as any common themes, challenges, or opportunities that emerge from the presentations.

Outcomes

This in-class activity helps students develop a deeper understanding of the practical applications of various machine learning techniques in business decision-making and encourages critical

thinking and reflection on these topics. By working in groups and presenting their findings, students practice their research, communication, and collaboration skills.

Week 5 Assignment (Rubric)

This assignment encourages students to think critically about the ethical considerations associated with using AI and machine learning in business decision-making. Students write a short essay discussing the potential ethical issues, their implications, and possible strategies to address these challenges.

Instructions

Write a short essay (approximately 500-750 words) discussing the ethical considerations for using AI and machine learning in business decision-making. In your essay, cover the following points:

1. Identify and explain the key ethical considerations associated with using AI and machine learning in business decision-making. Consider factors such as fairness, transparency, privacy, accountability, and potential biases in the development and deployment of AI and machine learning models.
2. Discuss the potential implications and consequences of these ethical considerations for individuals, organizations, and society at large. Consider the risks associated with biased models, unfair outcomes, privacy violations, lack of transparency, and other ethical concerns.
3. Suggest possible strategies and best practices to address the ethical challenges associated with AI and machine learning in business decision-making. Discuss how businesses can adopt a more ethical approach to AI and machine learning development and deployment, including data collection, model design, evaluation, and use.
4. Reflect on the importance of ethical considerations in AI and machine learning, and the role of businesses, policymakers, and other stakeholders in ensuring the responsible and ethical use of these technologies.
5. Support your arguments with relevant examples, case studies, or research findings from the course materials, as well as any additional sources you may find helpful.
6. Ensure your essay is well-structured, with clear and concise language, and follows proper citation and referencing guidelines.
7. Submit your essay for the assignment.

Week 6: Implementing AI and Prescriptive Analytics Solutions

Assignments to complete this week:

- Reading:
  - Articles:
    - A Business Guide to Modern Predictive Analytics
    - How to Set Your AI Project Up for Success
  - Study:
    - Influence of Artificial Intelligence (AI) on Firm Performance: The Business Value of AI-based Transformation Projects

Week 6 Live Class Activity

Objective

This in-class activity engages students in a theoretical discussion about the factors that should be considered when selecting AI and prescriptive analytics solutions for specific business problems. This discussion-based activity helps students understand the complexities and importance of choosing the right methodologies and tools for their projects.

Instructions

1. Form small groups, as determined by the instructor. (The instructor provides each group with one of the following discussion prompts related to selecting AI and prescriptive analytics solutions:
   a. What are the key factors to consider when choosing an AI and prescriptive analytics solution for a specific business problem? How do these factors influence the success and effectiveness of the solution?
   b. Discuss the importance of understanding the business context and objectives when selecting an AI and prescriptive analytics solution. How can a lack of understanding lead to suboptimal or ineffective solutions?
   c. Compare and contrast different AI and prescriptive analytics techniques and tools, such as machine learning algorithms, optimization methods, and simulation techniques. What are the advantages and disadvantages of each, and how do you choose the most appropriate method for a specific project?
   d. How can data quality, data availability, and data granularity influence the selection of an AI and prescriptive analytics solution? What steps can be taken to ensure that the chosen solution is compatible with the available data and meets the project requirements?
   e. Discuss the role of organizational culture, resources, and infrastructure in the selection and implementation of AI and prescriptive analytics solutions. How can these factors impact the success of a project, and what strategies can be employed to address potential challenges or constraints?)
2. Take 15-30 minutes to discuss your group's assigned prompt, drawing on your experiences, knowledge, and any relevant resources or case studies. Ask questions, share insights, and critically evaluate different perspectives and approaches.
3. Share the main points or insights from your group's discussion with the entire class.

4. As a class, synthesize the key takeaways from each group and address any additional questions or concerns.

Outcomes
This in-class activity helps students develop a deeper understanding of the factors that contribute to the success of AI and prescriptive analytics implementations in real-world business contexts and encourage critical thinking and reflection on these issues. By working in groups and presenting their analysis, students practice their research, communication, and collaboration skills.

Week 6 Discussion (Rubric)

What factors should be considered when selecting an AI and prescriptive analytics solution for a specific business problem? Discuss the various aspects that can impact the effectiveness, efficiency, and suitability of an AI and prescriptive analytics solution for different business contexts.

Week 7: Integrating Data from Multiple Sources

Assignments to complete this week:

- Reading:
  - Articles:
    - 5 Data Integration Methods and Strategies
    - Big Data: An In-Depth Introductory Guide
  - Blog:
    - Web Scraping vs. API: What's the Best Way to Extract Data?

Week 7 Live Class Activity

Objective

This in-class activity engages students in a theoretical discussion about the challenges, techniques, and best practices related to data integration. This discussion-based activity helps students understand the complexities and importance of integrating data from different sources in AI and prescriptive analytics projects.

Instructions

1. Form small groups, as determined by the instructor. (The instructor provides each group with one of the following discussion prompts related to data integration:
   a. What are the main challenges associated with integrating data from different sources, and why is it important to address these challenges in AI and prescriptive analytics projects?
   b. Compare and contrast different data integration techniques, such as joining, merging, concatenating, and blending. What are the advantages and disadvantages of each technique, and how do you choose the most appropriate method for a specific project?
   c. Discuss the role of data quality, data consistency, and data compatibility in successful data integration efforts. What steps can be taken to ensure that integrated data meets these criteria?
   d. How can data transformation and feature engineering help enhance the usefulness and relevance of integrated data for AI and prescriptive analytics projects?
   e. What are some best practices for managing data integration efforts, such as documentation, data governance, and data lineage? How do these practices contribute to the success of AI and prescriptive analytics projects?)
2. Take 15-30 minutes to discuss your group's assigned prompt group, drawing on your experiences, knowledge, and any relevant resources or case studies. Ask questions, share insights, and critically evaluate different perspectives and approaches.
3. Share the main points or insights from your group's discussion with the entire class.
4. As a class, synthesize the key takeaways from each group and address any additional questions or concerns.

Outcomes

This in-class activity encourages students to engage in a theoretical discussion about the challenges and techniques associated with data integration and the role it plays in AI and prescriptive analytics. By sharing their experiences, insights, and questions, students develop a deeper understanding of the complexities of integrating data from different sources and the importance of adopting best practices to ensure the success of their projects.

Week 7 Discussion (Rubric)

Discuss the challenges and advantages of integrating data from multiple sources. Share an example from your work or studies where data integration played a key role in achieving a successful outcome in AI, prescriptive analytics, or a related data-driven project.

Week 7 Final Assignment (Rubric)

This final assignment allows students to apply the concepts and techniques they've learned throughout the course to a real-world business problem or scenario. Students submit a comprehensive report on their final project, demonstrating their understanding of AI and prescriptive analytics methodologies, data sources, analysis techniques, and ethical considerations.

Instructions:

1. Select a real-world business problem or scenario in which AI and prescriptive analytics can be applied. The problem should be relevant to your industry or area of interest and should be scoped to a level that can be addressed within the timeframe of the course.
2. Prepare a comprehensive 5-7 page, APA-formatted report covering the following sections:
    a. Problem Statement: Clearly define and describe the business problem or scenario that you aim to address. Explain the relevance, importance, and potential impact of the problem on the organization or industry.
    b. Methodology: Describe the AI and prescriptive analytics methodologies that you have chosen to address the problem. Explain the rationale behind your choice of methodologies and how they are suitable for the specific problem or scenario.
    c. Data Sources: Identify and describe the data sources you are using, including their origin, format, and any relevant attributes or features. Discuss any challenges related to data quality, integration, or privacy, and how you address these issues.
    d. Analysis: Explain the process of cleaning, preprocessing, and analyzing the data, including any feature engineering, data visualization, or machine learning techniques used. Describe any analysis challenges and how you address them.
    e. Results: Present the results of your analysis, including any insights, predictions, or recommendations derived from the AI and prescriptive analytics methodologies. Use appropriate visualizations and quantitative measures to support your findings.
    f. Recommendations for Implementation: Based on the results of your analysis, provide recommendations for implementing the AI and prescriptive analytics solution in the organization or industry. Discuss any potential challenges or risks associated with implementation and suggest strategies for overcoming them.

g. Ethical Considerations: Reflect on the ethical considerations related to your project, such as fairness, transparency, and privacy. Discuss how you address these considerations in your analysis and recommendations and any potential areas for improvement.

3. The final assignment needs to be well-structured, clear, and concise with appropriate references to relevant literature, resources, or case studies. The report needs to demonstrate your understanding of AI and prescriptive analytics concepts and techniques, as well as your ability to apply them to a real-world business problem or scenario.
4. Submit your project for the final assignment.

Week 8: Course Recap and Final Project Presentation

Assignments to complete this week:

- Reading:
  - Articles:
    - Competing in the Age of AI
    - From Prediction to Transformation
  - Blog:
    - Building a Career in Data Science and Analytics: The Ultimate Guide

Week 8 Final Assignment Presentation (Rubric)

Objective

Students present their final projects to the class, showcasing their application of AI and prescriptive analytics concepts and techniques to a real-world business problem or scenario. This activity gives students the opportunity to practice their presentation and communication skills, as well as receive feedback from their peers and instructor.

Instructions

1. Each student will be given 5-10 minutes to share a presentation of their final projects, allowing for Q&A and feedback after each presentation.
2. Student presentations will cover the following aspects of their final project:
   a. Business Problem: Briefly introduce the business problem or scenario, explaining its relevance, importance, and potential impact on the organization or industry.
   b. Solution: Describe the AI and prescriptive analytics methodologies used to address the problem, explaining the rationale behind their choice and how they are suitable for the specific problem or scenario.
   c. Data Sources: Provide an overview of the data sources used in the project, discussing any challenges related to data quality, integration, or privacy, and how these issues were addressed.
   d. Analysis: Summarize the process of cleaning, preprocessing, and analyzing the data, including any feature engineering, data visualization, or machine learning techniques used. Highlight any challenges encountered and how they were addressed.
   e. Results: Present the results of the analysis, including any insights, predictions, or recommendations derived from the AI and prescriptive analytics methodologies. Use appropriate visualizations and quantitative measures to support the findings.
   f. Recommendations for Implementation: Based on the results, discuss recommendations for implementing the AI and prescriptive analytics solution in the organization or industry, including any potential challenges or risks, and strategies for overcoming them.
   g. Ethical Considerations: Reflect on the ethical considerations related to the project and how they were addressed in the analysis and recommendations.
3. Use visual aids, such as slides or handouts, to support their presentation and make it engaging and easy to follow.

4. After each presentation, time will be allowed for Q&A and feedback from the class, encouraging students to ask questions, share their thoughts, and provide constructive feedback to their peers.

Outcomes
This in-class activity enables students to showcase their final projects, practice their presentation and communication skills, and receive valuable feedback from their peers and instructor. The presentations foster a sense of community and shared learning among the class, encouraging students to learn from each other's experiences and insights.

Week 8 Discussion (Rubric)

Reflect on what you've learned in this course. How do you plan to apply the concepts and techniques in AI and prescriptive analytics to your career or future projects? Discuss the key takeaways and insights that you find most valuable and how you will utilize them in your professional or academic pursuits.