PSET4: Exploring Bias in Healthcare: Analyzing the Diabetes Dataset (Team Assignment)

Objective: This team assignment promotes student collaboration and fosters interdisciplinary learning. The assignment focuses on analyzing the Diabetes dataset, identifying potential biases, and proposing strategies to mitigate or address the biases found in healthcare.

Motivation: Collaboration is crucial to effectively addressing data and algorithm bias. By working in interdisciplinary teams, students can leverage their diverse perspectives and knowledge to gain deeper insights into bias in healthcare. Data science students can contribute their expertise in data analysis and modeling, while non-data science students can provide valuable insights from their domain knowledge in law, healthcare, or other relevant areas. The goal of this assignment is to foster teamwork, critical thinking, and a better understanding of bias in healthcare.

Dataset: For this assignment, your team will work with the provided "Diabetes" dataset. The dataset contains several features related to diabetes patients, including demographic information, medical examinations, and diagnostic measurements.

Assignment Steps:

Step 1: Team Formation

1. Start communicating with the team members for your PSET assignments – the same team for the previous PSET assignment (NOT the role-play groups).
2. Review each team member's skills and background. Come up with a divide-and-conquer team plan to best complete this assignment.
3. Identify an individual who will submit the assignment for the team. The team should also agree on how to communicate and the frequency of the team meetings.

Step 2: Dataset Exploration

1. Download the "Diabetes" dataset.
2. Collaboratively examine the dataset, discussing its structure, attributes, and potential biases that may arise in healthcare contexts.
3. Identify relevant attributes, such as age, gender, race, or other attributes related to healthcare disparities, to explore potential biases.

Step 3: Bias Identification and Analysis

1. Collaboratively analyze the dataset to identify potential sources of bias.
2. Use descriptive statistics, data visualization techniques, or other appropriate methods to explore and visualize any potential biases within the dataset. You can use Excel, Python, Tableau, or any tools that the team decided to use for the exploratory data analysis.
3. Discuss and interpret the findings as a team, considering each team member's perspectives and expertise.

Step 4: Bias Mitigation Strategies

1. Collaboratively propose strategies to mitigate or address the identified biases, leveraging your team's interdisciplinary knowledge and insights.
2. Consider ethical considerations and fairness principles when developing these strategies.
3. Discuss and evaluate each strategy's feasibility and potential impact as a team.

Step 5: Team Report and Presentation

1. Prepare a comprehensive team report that includes your findings, analysis, and proposed bias mitigation strategies.
2. Assign sections of the report to team members based on their strengths and interests, ensuring that everyone contributes to the final report.
3. Create a visually engaging team presentation summarizing your report, highlighting key findings, and discussing the proposed strategies. This includes the PowerPoint presentation Slides and a link to the team's video presentation. The teaching team will review the video presentation for grading. All video presentations will be shared with the entire class through the Canvas classroom.

Submission Guidelines:

1. Submit your team report and presentation slides as separate documents.
2. indicate the names of all team members on the submission. Also, specify members who were not able to participate.
3. Include appropriate citations and references for any external sources used.
4. Ensure your report is well-organized, clearly written, and includes appropriate visual aids to support your analysis.

Grading Criteria:

- Teamwork and Collaboration: 10% (assumed unless there are issues)
- Dataset exploration and understanding: 10%
- Bias identification and analysis: 25%
- Bias mitigation strategies: 25%
- Team report and presentation clarity and effectiveness: 20%
- Overall analysis and critical thinking: 10%

Important Reminders:

1. Foster an inclusive and respectful team environment, valuing all members' diverse perspectives and contributions.
2. Encourage open communication and active participation from each team member.

3. Emphasize the importance of interdisciplinary learning and knowledge sharing within the team.
4. Maintain academic integrity by properly attributing and referencing any sources used in your analysis.

By working collaboratively in teams, you can leverage your collective knowledge and skills to thoroughly analyze the Diabetes dataset, identify potential biases, and propose meaningful strategies to mitigate those biases in healthcare.