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Public Health AI Assignment

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PH 504 Planning and Management for Public Health

Instructor: Amber Lyon-Colbert PhD, MS; amber.lyon@und.edu; SMHS E169

Programming and Health Promotion Assignment: Leveraging AI for Public Health Impact

Assignment Overview:

In this assignment, you will combine your knowledge of programming and health promotion to design an innovative solution that utilizes Artificial Intelligence (AI) to address a specific public health challenge. The assignment aims to enhance your skills in programming, data analysis, and health promotion strategies while applying AI technologies to real-world public health scenarios.

This assignment utilizes course foundational knowledge: Explain the social, political and economic determinants of health and how they contribute to population health and health inequities.

This assignment addresses and strengthens our CEPH Competency #5 D2-11 Select methods to evaluate public health programs.

Assignment Objectives:

1. **Understand AI in Public Health:** Explore how AI technologies can be applied to public health initiatives and identify potential areas where AI can make a positive impact on health planning and promotion.
2. **Programming Proficiency:** Develop and demonstrate programming skills by designing, implementing, and evaluating an AI-powered solution.
3. **Health Promotion Strategies:** Apply health promotion theories and strategies to create an effective plan for using AI to address a specific public health issue.
4. **Data Analysis and Interpretation:** Collect, process, and analyze relevant data to inform your AI solution and evaluate its effectiveness.
5. **Ethical Considerations:** Address ethical and privacy concerns related to using AI in public health and propose strategies to mitigate potential risks.

Assignment Tasks:

Task 1: Select a Public Health Issue of importance within your community (10%)

Choose a specific public health issue that can benefit from AI technologies. It could be related to disease prevention, health education, healthcare management, or any other relevant area. Justify your choice based on existing data and literature.

Task 2: Design an AI-Powered Solution (20%)

1. Explain how AI can be applied to address the chosen public health issue.
2. Define the objectives and goals of your AI solution.
3. Outline the data requirements for your AI model and describe the data collection process.

Task 3: Programming and Implementation (25%)

1. Develop an AI model to achieve the goals of your solution. You can use programming languages like Python and libraries/frameworks such as TensorFlow, PyTorch, or scikit-learn.
2. Train and test your AI model using appropriate datasets.

3. Document the code, algorithms, and methodologies used in the implementation.

Task 4: Health Promotion Plan (15%)

1. Apply health promotion theories and strategies to create a comprehensive plan for promoting the adoption and utilization of your AI solution.
2. Describe how you will engage stakeholders and communicate the benefits of your solution to the target audience.

Task 5: Data Analysis and Evaluation (20%)

1. Collect and preprocess relevant data to evaluate the effectiveness of your AI solution.
2. Analyze the results of your AI model's performance in addressing the public health issue.
3. Discuss the implications of your findings and suggest possible improvements.

Task 6: Ethical Considerations (10%)

1. Identify potential ethical and privacy concerns associated with your AI solution.
2. Propose strategies to address these concerns and ensure responsible and ethical use of AI in public health.

Deliverables:

1. Written report (single-spaced, 11-12 pt font, 3-4 pages) that includes:
 - Introduction and rationale for the chosen public health issue.
 - Explanation of how AI can address the issue.
 - Detailed description of your AI-powered solution.
 - Programming code and algorithms used.
 - Health promotion plan.
 - Data analysis results and interpretation.
 - Ethical considerations and mitigation strategies.
 - Conclusion and recommendations for future work.
2. Presentation:
 - Deliver a 10 minute in-class or virtual presentation summarizing your project to your peers and instructor.

Assessment Criteria:

- Depth of understanding of AI's application in public health.
- Quality of AI model implementation and data analysis.
- Application of health promotion strategies.
- Ethical considerations and mitigation plans.
- Overall clarity, organization, and presentation of the report and presentation.

*Note- This assignment provides a platform for you to explore the intersection of programming, health promotion, and AI. Your creativity and critical thinking will play a crucial role in developing an impactful solution for the chosen public health challenge.

Assignments to be uploaded via BlackBoard week 7, **Due 10/8/23 by 11:59 pm**

Grading Rubric

Criteria	Excellent (90-100%)	Good (80-89%)	Satisfactory (70-79%)	Needs Improvement (Below 70%)
Task 1: Selection of Public Health Issue				
Relevance and Justification	Thoroughly justified the choice of public health issue with strong data and literature support.	Justified the choice of public health issue with data and literature support.	Provided some justification for the choice of public health issue.	Justification for the choice of public health issue is lacking or unclear.
Task 2: Design of AI-Powered Solution				
AI Application and Objectives	Clearly explained how AI can effectively address the chosen public health issue. Defined clear and specific objectives for the AI solution.	Explained how AI can address the chosen public health issue. Defined objectives for the AI solution.	Provided a general explanation of AI's role in addressing the issue. Objectives for the AI solution are vague.	Explanation of AI's role and objectives is unclear or inadequate.
Data Requirements and Collection	Thoroughly outlined data requirements and described a comprehensive data collection process.	Outlined data requirements and described data collection process.	Mentioned data requirements and briefly described data collection process.	Data requirements and collection process are unclear or insufficient.
Task 3: Programming and Implementation				
AI Model Implementation and Evaluation	Developed a sophisticated AI model with excellent programming skills. Implemented, trained, and tested the model effectively.	Developed a functional AI model with good programming skills. Implemented, trained, and tested the model competently.	Developed a basic AI model with some programming skills. Implemented, trained, and tested the model adequately.	AI model implementation lacks functionality and effectiveness.
Documentation of Code and Methodologies	Thoroughly documented code, algorithms, and methodologies used in the implementation.	Documented code, algorithms, and methodologies used in the implementation.	Provided documentation for code and methodologies used. Documentation is somewhat incomplete.	Inadequate or unclear documentation of code and methodologies.
Task 4: Health Promotion Plan				

Application of Health Promotion Strategies	Applied a variety of health promotion strategies effectively to promote the adoption of the AI solution.	Applied relevant health promotion strategies to promote the adoption of the AI solution.	Applied some health promotion strategies to promote the AI solution.	Limited or ineffective application of health promotion strategies.
Stakeholder Engagement and Communication	Presented a comprehensive plan for engaging stakeholders and effectively communicating the benefits of the AI solution.	Presented a plan for engaging stakeholders and communicating benefits.	Provided a basic plan for stakeholder engagement and communication.	Plan for stakeholder engagement and communication is unclear or inadequate.
Task 5: Data Analysis and Evaluation				
Data Collection and Preprocessing	Collected and preprocessed data effectively for analysis.	Collected and preprocessed data for analysis.	Collected and partially preprocessed data for analysis.	Data collection and preprocessing are incomplete or insufficient.
Results Analysis and Interpretation	Analyzed results comprehensively and provided insightful interpretation.	Analyzed results and provided clear interpretation.	Analyzed results and provided basic interpretation.	Limited or unclear analysis and interpretation of results.
Task 6: Ethical Considerations				
Identification of Ethical Concerns	Identified potential ethical and privacy concerns accurately.	Identified ethical concerns related to the AI solution.	Mentioned some ethical concerns related to the AI solution.	Ethical concerns are not properly identified or discussed.
Mitigation Strategies	Proposed well-considered strategies to address ethical concerns effectively.	Proposed strategies to address ethical concerns.	Proposed basic strategies to address ethical concerns.	Mitigation strategies for ethical concerns are lacking or inadequate.
Report Quality and Presentation				
Clarity and Organization	Report is well-structured, clear, and organized logically.	Report is clear and organized.	Report is somewhat clear and organized.	Report lacks clarity and organization.
Presentation Skills	Delivered a highly engaging and polished presentation with excellent communication skills.	Delivered a well-prepared presentation with good communication skills.	Delivered a somewhat prepared presentation with acceptable communication skills.	Presentation skills are poor or ineffective.
Overall Assessment				
Total Score				