Computer Science Capstone Topic Approval Form

The purpose of this document is to help you clearly explain your capstone topic, project scope, and timeline. Identify each of these areas so that you will have a complete and realistic overview of your project. Your course instructor cannot sign off on your project topic without this information.

Note: You must fill out and submit this form. Space beneath each number will expand as needed.

Any cost associated with developing the application will be the responsibility of the student.

INFORM INSTRUCTOR:

Potential use of proprietary company information: (Y/N) **N**

ANALYSIS:

1. Project topic AND description:

   Western General Medical Group wishes to obtain a tool that assists in preliminary Diabetes detection based on independent variables BMI, family history of diabetes, and age and the dependent variable of Diabetes presence from an existing dataset. The relationship of the health information BMI, Diabetes pedigree function, and age fields will not provide a base to identify an individual.

2. Project purpose/goals:

   The goal and purpose is to assist healthcare providers at Western General Medical Group in performing routine check-ups for preliminary Diabetes detection. The machine learning tool will analyze data fields about historical patient data without identifying individuals.

3. Descriptive method:

   Visualization will consist of, but not limited to, three-dimensional and linear regression graphs among two or more independent variables. The visualizations may also consist of one-and-one graphing, such as bar graphs relating one independent variable (BMI, Diabetes pedigree function, and age) to the dependent variable (Diabetes presence) to assist in surface-level analysis. Further, a heatmap demonstrating the Diabetes presence of the dataset tied to all three independent variables is of consideration.

4. Predictive/Prescriptive method:

   The tool will use a machine learning model to assist in future routine check-ups for preliminary Diabetes detection based on a dataset of Diabetes presence concerning BMI, family history of diabetes, and age. The model will return a Boolean prediction if the data BMI, Diabetes pedigree function, and age are in a risk range determined by a classification algorithm, e.g., logistic regression, k-means clustering, etcetera.

DESIGN and DEVELOPMENT:

1. Computer science application type (select one):
    - Mobile (indicate Apple or Android)
    - Web
    - Stand-Alone

Application type:
Stand-Alone.

2. Programming/development language(s) you will use:

Programming/development language(s):
Python.

3. Operating System(s)/Platform(s) you will use:

Operating System(s)/Platform(s):
Designed for/on Windows 10 64-bit.

4. Database Management System you will use:

Database Management System:
Not Applicable, data read with Python libraries.

5. Estimated number of hours for the following:
    i. Planning and Design: 48.
    ii. Development: 96.
    iii. Documentation: 24.
    iv. Total: 168.

6. Projected completion date:

    Projection: 10/01/2023 - 11/01/2023.

IMPLEMENTATION and EVALUATION:

1. Describe how you will approach the execution of your project:

    - Begin execution by meeting with Western General Medical Group stakeholders to discuss product as a whole, including requirements and objectives to be met in the projected completion date.
    - Develop the initial model to properly initiate training.
    - Develop a user interface to input values pertaining to the independent variables required for the tool (BMI, Diabetes pedigree function, and age fields respectively.)
    - Develop documentation for all areas of the tool while debugging and testing for required tool functionality.

- ✓ **This project does not involve human subjects research and is exempt from WGU IRB review.**

STUDENT SIGNATURE

By signing and submitting this form, you acknowledge any cost associated with development and execution of the application will be your (the student) responsibility.

COURSE INSTRUCTOR'S NAME: 

COURSE INSTRUCTOR APPROVAL DATE: 09/03/2023