**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)

**ANALYSIS:**

1. Project topic AND description:

My project topic is going to be using a *Binary* *Classification Machine Learning* algorithmto determine if a mushroom is poisonous or edible based on the observable attributes. I intend to analyze attributes of a mushroom and determine which attributes are more likely to lead to a mushroom being poisonous or edible. The expected outcomes will be *poisonous* and *edible*. This will be done by using a model that can determine the frequency of certain characteristics in both poisonous and edible mushrooms.

Client:

The client for this product will be the *Mushroom Investigation Group (MIG)*. The company is responsible for foraging for mushrooms to feed those in need around the world. Because of the nature of their business, it is crucial that the MIG has a quick and accurate way to identify edible and poisonous mushrooms. This program will allow for the MIG to do that.

1. Project purpose/goals:

The purpose of this project will be to showcase my ability to create a program that can quickly and accurately determine the edibility of a wild mushroom. Machine learning models are used for many different forms of classification and will be very helpful here. The goal of this project is to develop a working program that can receive data about a mushroom, process it, and return to the user whether the mushroom is edible or poisonous.

1. Descriptive method:

This project will use the *K-means clustering* algorithm as a method for learning from the input data. This will allow us to view a scatterplot of the data and classify the different clusters as edible and poisonous.

1. Predictive/Prescriptive method:

For the predictive method I have chosen to use a *Support Vector Machine* algorithm to predict if a mushroom is poisonous or edible. This will create a supervised learning model that will weigh the attributes of mushroom data into the classification of edible or poisonous. This is determined by the frequency of each word attribute that has wide variance of occurrence between edible and poisonous mushrooms.

**DESIGN and DEVELOPMENT:**

1. Computer science application type (select one):

* Mobile (indicate Apple or Android)
* Web
* Stand-Alone

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

Development will be done with Python using data analytics tools and libraries (matplotlib, pandas, sklearn, etc.)  
The core algorithm will be written in Jupyter Notebook.

1. Operating System(s)/Platform(s) you will use:  
   Windows10
2. Database Management System you will use:  
   N/A
3. Estimated number of hours for the following:
   * 1. Planning and Design: 10
     2. Development: 20
     3. Documentation: 5
     4. Total: 35
4. Projected completion date:

December 15, 2022

**IMPLEMENTATION and EVALUATION:**

1. Describe how you will approach the execution of your project:
2. Acquire dataset from Kaggle.com
3. Familiarize myself with and sanitize the data.
4. Create a model with the data
5. Train the model
6. Evaluate
7. Determine the efficacy of the program. If I am unhappy with the results, I will go back to step 3 and start again.
8. Create documentation and graphics for data.

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



**STUDENT SIGNATURE**

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**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:**

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**COURSE INSTRUCTOR APPROVAL DATE:**