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 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.

Note: Any costs 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:
   Topic: Predicting Future Population Trends in US Cities.
   Includes city population, annual change, density, and area for all 300 US cities.

2. Project purpose and goals:
   Predict cities with the highest growth rate in the future to determine possible future locations for future business offices and potential areas for sales.

3. Descriptive method:
   a. Check datatypes and missing values
   b. Use Panda's describe() method to get the mean, median, mode, average etc.
   c. Use histograms to show the distribution for population and annual growth.
   d. Show the top 12 cities with the highest and lowest growth via chart.
   e. Use heatmap to show feature correlations

4. Predictive or prescriptive method:
   I will use predictive analysis to determine which cities will have the highest growth rate in the future with a linear regression model. The least squares regression method will be used to plot a predictive line.

DESIGN and DEVELOPMENT:

1. Computer science application type (select one):
   Stand-alone

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

3. Operating system(s) or platform(s) you will use:
   Windows 10

4. Database Management System you will use:
   n/a (cvs file data)

5. Estimated number of hours for the following:
   i. Planning and design: 10
   ii. Development: 30
   iii. Documentation: 15
   iv. Total: 55

6. Projected completion date:
   7/31/2024

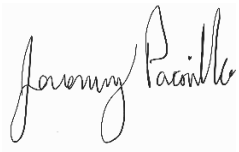
IMPLEMENTATION and EVALUATION:

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

   First install Juptyr notebook and Python. Second, create a new notebook and start data exploration. Use descriptive methods to evaluate data. Find features from data after exploration and remove any unnecessary data. Train and evaluate the model to calculate the mean squared error and r^2 values. Visualize the predictions.

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

Students SIGNATURE:



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

Charles Paddock

INSTRUCTOR'S SIGNATURE:

INSTRUCTOR APPROVAL DATE:7/18/2024