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: No

ANALYSIS:

1. Project topic and description: The project topic is developing a personalized movie recommender system using collaborative filtering or content-based filtering techniques. The system will use an extensive movie database to analyze user preferences and recommend movies tailored to their interests.

2. Project purpose and goals: The primary purpose of this project is to design and develop an effective movie recommender system that provides users with personalized movie suggestions. The goals of this project are to explore and evaluate collaborative and content-based filtering techniques, to develop a scalable and efficient system using a large movie database, and to develop a metric to assess the system's performance and accuracy in recommending movies that align with user preferences.

3. Descriptive method: The descriptive method in this project involves exploratory data analysis of a large database such as the MovieLens database to understand the user rating patterns, movie genres, and other relevant features and how they relate to each other. This analysis will provide insights into user preferences and the design of the recommender system.

4. Predictive or prescriptive method: This project will employ predictive methods. Primarily, I will look into collaborative filtering techniques as a primary way to predict user preferences. This is done by taking the behavior of users and finding users who like the same films to create a score of how similar certain movies are to each other.

DESIGN and DEVELOPMENT:

1. Computer science application type (select one): The application type will be stand-alone.

2. Programming/development language(s) you will use: The primary development language will be Python to use the pandas library for working with data and developing the machine learning system.

3. Operating system(s) or platform(s) you will use: Primarily, you will use Windows 11 for development, but the system should be able to be used on any modern platform or operating system.

4. Database Management System you will use: PostgreSQL will be used for the database management system.

5. Estimated number of hours for the following:
   i. Planning and design: 8
   ii. Development: 25
   iii. Documentation: 4
   iv. Total: 37

6. Projected completion date: October 24th

IMPLEMENTATION and EVALUATION:

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

a. Obtain a movie database such as MovieLens and preprocess the data. Handle missing values, normalize data, and transform data into a suitable format for analysis.
b. Exploratory data analysis using data visualization and descriptive statistics to understand user rating patterns and discover relevant data features.
c. Select and develop an appropriate algorithm. This step will involve exploring different algorithms and selecting the one best fit for purpose.
d. Train and fine-tune the selected algorithm(s) using the preprocessed data then optimize the hyperparameters for improved performance.
e. Develop an interface for users to input their preferred movies and receive recommendations.
f. Testing and debugging.

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

STUDENT'S SIGNATURE

Arturo Vega

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.

INSTRUCTOR'S SIGNATURE:

INSTRUCTOR APPROVAL DATE: Friday, October 18, 2024