Section 1: Project Data

Student Information

- Student name: Vinay Varma Pericherla
- Contact phone number: +1 443-453-2040
- UMBC email address: HR57897@umbc.edu

- Semester and year of capstone experience: 4th and no capstone experience
- Expected graduation date: May 2024

Capstone Course Information

- Capstone faculty: Mohammad Samarah

Sponsor Client Information

- Client contact name: Mohammad Samarah
- Client contact title: Professor
- Client contact email address: msamarah@umbc.edu
- Client organization name: UMBC

Section 2: Project Information

Project Title: Machine learning prediction model for selecting UMBC graduate programs

Problem Statement: Finding an appropriate graduate program at UMBC can be a challenge for many students. A lot of individuals are confused by the present program selection process, which causes them to either not make a decision or to choose a program that isn't a good fit. Building a machine learning model that can analyze a student's academic record, interests, and professional goals in order to determine which program at UMBC graduate school would be the best fit is the primary objective of this project.

Short Description of Project History and Evolution: The idea for this project came from the challenges that students have choosing graduate programs. The focus was on making a tool to help students make decisions and walk them through the choosing process which include making a machine learning model that can make program suggestions that are unique to each student.

Section 3: Project Background

Description of Client and Their Organization: Mohammad Samarah, Program Director of Software Engineer at UMBC. There are many undergraduate and graduate studies at UMBC, which is a public research university. The UMBC Career Center gives students the tools and support they need to look into career possibilities and make smart choices about their academic paths.

Description of Client, Stakeholders, Shareholders, and Their Expectations for this Project:

- I hope that this tool will help with finding students and choosing programs.
- This tool can help program directors find students who would be a good fit for their progr ams.

Description of Required Resources and Where They Will Be Obtained:

- Information about the graduate programs at UMBC, including admission requirements, course content, and job outcomes
- Machine learning software and computing resources

Anticipated Challenges, Risks, and Mitigation Strategies:

- Data availability and quality: Make sure that you can get to the appropriate student and program data and fill in any blanks or missing data.
- Model accuracy and bias: Implement techniques to make sure the model's predictions are correct and impartial.

Section 4: Proposed Solution

Requirements Engineering Methods Used:

- Analyze existing student data and program information to identify relevant factors for model development.
- Requirements can be gathered through stakeholder interviews, surveys, and analysis of existing processes.

Analysis, Prototyping, and Building of Functions, Features, and System Abilities:

- Develop a machine learning model that can look at student data and predict which graduate programs at UMBC will be most appropriate for each one.

- Design a user interface that lets students enter information about their education, hobbies, and career goals.

- In addition to the model's suggested programs, the system will show additional details for each one.

Data Needs and Handling:

- Student data includes grades, test scores, and job interests that have been made anonymous.

- Program data: admission requirements, curriculum details, and career outcomes for each UMBC graduate program.

- Data will only be gathered with the right permissions and will be kept safe according to UMBC's data privacy policies.

- Data mapping tools will be used to look for connections between data about students and program data.

Expected Benefits of Functions, Features, Performance Level of Non-functional Requirements:

- Improved student decision-making: The model will provide personalized recommendations that help students select the most

Req. ID	Requirement stated as a user story	Expected Completion Date	Complexity	Risk
R1	As a student, I want to enter my academic background (GPA, major, etc.) so the system can recommend suitable graduate programs.	03/30	Medium	Low
R2	As a student, I want to specify my career interests (research, healthcare) so the system can refine its program recommendations.	03/30	Medium	Low
R3	As a student, I want to upload my resume to allow the system to analyze my skills and experience for program matching.	04/20	High	Medium
R4	As a student, I want the system to explain the rationale behind its recommended graduate programs.	04/20	High	Medium
R5	As a program director, I want to access a dashboard to view the students recommended for my program and their profiles.	04/20	High	Medium

R6	As a program director, I want to see the criteria used by the model to recommend students for my program.	04/20	Medium	High
R7	As a student, I want to View detailed program information of the program like deadlines, faculty, and career outcomes.	03/30	High	Medium
R8	As a student, I want to compare the recommended programs side-by-side to see key differences (e.g., curriculum, cost, application deadlines).	03/30	Medium	Low
R9	As a student, I want to save my program recommendations for later review and comparison.	04/20	Medium	Low
R10	As a system administrator, I want to monitor the model's performance and accuracy over time.	05/05	High	High
R11	As a system administrator, I want to implement mechanisms to detect and address potential biases in the model's predictions.	05/05	High	High
R12	As a student, I want to provide feedback on the program recommendations so the system can learn and improve over time.	05/05	Medium	Medium