**Individual Capstone Assessment**

Almaamar Alkiyumi

University of Cincinnati

CS 5001: Capstone Project

Prof. Fred Annexstein

September 13, 2024

**Individual Capstone Assessment**

**Introduction**

My senior design project focuses on upgrading Midea’s web scrapers to enhance their functionality and user experience. From my academic perspective, this project represents a culmination of my studies in computer science and web development. The goal is to create two user interfaces: one for end-users to easily scrape product data and another for developers to manage and update the scrapers. This project will leverage my technical skills and academic knowledge, providing a practical application of the theories and principles I have studied. By developing a user-friendly and adaptable tool, I aim to contribute to Midea’s efficiency and effectiveness in data collection.

**Guidance from College Curriculum**

My college curriculum has played a crucial role in shaping my approach to this project. Courses such as CS 4092: Database Design and Development have provided me with a solid foundation in full stack development, including database management and integration. These skills are essential for managing the scraper’s data storage and retrieval. CS 4033: Artificial Intelligence: Principles and Applications introduced me to AI concepts, which will be directly applicable in developing advanced features for the web scrapers. Additionally, EECE3093C: Software Engineering taught me the principles of formal software engineering documentation and methodologies such as Agile and Scrum, which are crucial for managing the project effectively. Courses like CS 4071: Design and Analysis of Algorithms, CS 2028C: Data Structures, CS 3003: Programming Languages, and CS 2071: Discrete Computational Structures have collectively enhanced my programming skills, enabling me to build a robust and scalable solution for Midea. These experiences have equipped me with the technical knowledge and practical skills necessary to ensure that the web scrapers are efficient, reliable, and well-documented.

**Guidance from Co-op Experiences**

My co-op experiences have been integral in developing both technical and non-technical skills that are crucial for my senior design project. At Midea Group (U.S.) as a Data Science Intern, I gained hands-on experience in web scraping and data analysis. Technical skills were polished through the use of Beautiful Soup and Pandas to streamline data collection processes, saving the company $15,000 annually. I also leveraged AI and natural language processing to enhance the accuracy of insights by 25% and saved 10 hours per week. This experience provided me with practical knowledge in Python programming and data manipulation, which will be directly applicable when upgrading Midea’s web scrapers. On the non-technical side, I developed strong problem-solving skills and the ability to communicate technical information effectively through dynamic dashboards and technical reports. These skills will be valuable in presenting the functionalities and benefits of the upgraded scrapers to various stakeholders. During my tenure at The Cincinnati Insurance Company (U.S.) as a Software Engineering Intern, I acquired valuable technical and non-technical skills. I improved database performance in SQL Server Management Studio (SSMS), which reduced data retrieval time by 30% and enhanced application performance for over 10,000 users. This experience sharpened my skills in database management and performance optimization, essential for managing the scraper’s data storage and retrieval systems. Additionally, leading the migration of applications to GitHub and automating builds with CI/CD tools taught me about efficient deployment practices and version control. Non-technically, working closely with senior developers and cross-functional teams improved my project management and collaboration skills, which will be crucial for coordinating the development of the web scrapers. At Deloitte & Touché (M.E.) as an Information Technology Audit Intern, I developed both technical and non-technical skills relevant to my project. I enhanced IT security measures and automated security controls using Excel VBA, which eliminated 80% of manual data entry and saved 25 hours weekly. This experience strengthened my problem-solving skills and attention to detail, crucial for ensuring the accuracy and reliability of the web scrapers. Additionally, evaluating IT systems and communicating findings improved my ability to assess and address complex issues, which will be important for maintaining the scraper’s effectiveness and addressing any challenges that arise during development. These co-op experiences have equipped me with a diverse set of skills that will be instrumental in the successful execution of my senior design project, ensuring that I can develop an efficient, reliable, and user-friendly web scraper.

**Motivation and Preliminary Project Approach**

I am highly motivated to participate in this project because it represents an opportunity to apply my academic knowledge and co-op experiences to a real-world problem. The challenge of upgrading Midea’s web scrapers excites me, as it involves both technical development and business user interface design, areas I am passionate about. My preliminary approach involves first analyzing the existing scraper’s architecture to identify areas for improvement. I will then design and develop the user interfaces, ensuring they are intuitive and efficient. I plan to use iterative testing and feedback to refine the tool and ensure it meets user needs. My expected results include a fully functional, user-friendly scraper and a well-documented project that demonstrates both technical proficiency and practical problem-solving.

**Self-Evaluation and Success Criteria**

To evaluate my contributions and determine the success of the project, I will set clear milestones and criteria for completion. Regular progress reviews and feedback from team members and stakeholders will help gauge whether the project meets its goals. I will assess the tool’s functionality based on user feedback and performance metrics to ensure it fulfills its intended purpose. Success will be measured by the tool’s usability, its effectiveness in data scraping, and its adaptability to changes in website structures. I will consider the project complete when it meets all functional requirements, receives positive feedback from users, and demonstrates a significant improvement over the existing scraper. This approach will ensure that I deliver a high-quality and impactful solution.