Garrison Gibson & Joseline Ly

Professor Dong

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# The Evergreen Project

According to the United States Department of Agriculture (USDA), 13.5 percent of American households are considered food insecure, meaning they have uncertain or limited access to food sources. Various groups and organizations, including Lopez Urban Farms, are working to address this issue by growing crops and collecting donations for those in need. In the Evergreen Project, we have committed ourselves to supporting Lopez Urban Farms in helping the community. A major challenge the farm faced, as discussed with Bianca, the farm's operations manager, was the inability to record volunteer contact information and activity hours without a Wi-Fi connection. Their focus on making the farm completely accessible also meant they did not use the Internet for many of the farm's operations. This made it difficult to manage resources and communicate effectively with volunteers. To resolve this issue, we developed a program that allows volunteers to enter information such as their name, email, phone number, start time, and end time, all without needing a Wi-Fi connection. The program stores this data in a spreadsheet, ensuring that each volunteer's contributions are recorded effectively and efficiently. By implementing this solution, Lopez Urban Farm can more easily stay in touch with its volunteers, facilitating more personalized communication and greater community involvement.

To prepare for the development of our program, we researched several topics. The first was hash maps. Through resources like W3Schools, GeeksforGeeks, and Oracle Docs, we

learned about hash maps and their potential utility for our project. We determined that hash maps were ideal because of their speed and efficiency in data searching. Another key area of research was adding data to a spreadsheet. We found that the .csv file format was best suited for this task because it simplifies the storage and visualization of data. This format allowed us to store volunteer information in an easily accessible form.

Our project required minimal materials. The primary technical resource we used was the Java Development Kit (JDK), which was essential for building and shaping the program. We also used Visual Studio Code (VSCode) as our Integrated Development Environment (IDE), chosen for its integration with GitHub and support for various add-ons. Several Java libraries, including Swing, Java Time Duration, Java Local Time, HashMap, and the Abstract Window Toolkit (AWT), greatly enhanced the efficiency and functionality of our program. Additionally, we utilized Google Docs and Google Slides to develop the proposal, slideshow, and this paper. Non-technical resources included functional devices capable of running the program. Our goal was to assist with volunteer management by creating an effective communication method between the farm and its volunteers, accomplished through a series of developmental phases: gathering information from the farm, program design planning, writing, and implementation/review.

The program we developed successfully met the needs of Lopez Urban Farm. Upon launching the program, volunteers are presented with a Java graphical user interface (GUI) that prompts them to register, log their hours, and/or save data to a .csv file. The farm can keep the popup running throughout the day and select “save to file” after all volunteers have entered their information or after each individual entry. When selecting "register volunteer," the program prompts the user to input their name, email, and phone number. After entering this information,

the volunteer can verify and ensure the details are accurate. Volunteers can then log their hours by selecting the “Log Hours” button, entering their start and end times in 24-hour format, and saving this data to the display. The information is stored and saved to the .csv file upon selecting "save to file."

While the program functions well, there are several areas for improvement. For instance, we could add more options to the volunteer menu, depending on what would benefit the farm most. Additionally, the graphical user interface (GUI) could be enhanced to be more visually appealing and user-friendly. Another improvement could involve automating tasks, such as creating a mailing list or sending personalized emails to volunteers. Finally, although we do include error handling for cases where a volunteer’s email is not registered, we could add more cases, such as invalid emails, duplicate names, and more.

In terms of data structures, we used several techniques learned in class. Hash maps were employed for their speed and efficiency in searching. We also used a bucket data structure alongside the hash map to improve the program's performance. Although it wasn't directly implemented in the code, we adopted a queue-style data structure to temporarily hold the data before it was written to the .csv file. This FIFO (first in, first out) method ensured that data was entered and saved in the correct order. Our literature review guided us in selecting hash maps, buckets, and queues as the most suitable data structures for the program.

Two significant setbacks occurred during the development of the project. The first was time constraints. The components of the program were completed later than expected due to other academic commitments. We managed this challenge by using time management techniques and allocating dedicated time each day to work on the project. The second setback was the

limited participation in the Evergreen project, as our team consisted of only two people. To overcome this, we focused on planning and maintaining strong communication to efficiently divide tasks and work within our schedules.

In conclusion, Lopez Urban Farms faced challenges in communicating with volunteers. Our solution, a volunteer log to collect contact information and record hours worked, addressed this need and should have a positive impact on the farm. With a system in place to maintain a volunteer base, the farm will be able to contact volunteers, foster relationships, and encourage future involvement. This will lead to increased community support, helping more people and improving the overall success of the farm. This project also presents opportunities for future scalability, such as the development of a mobile app or website with a QR code for easier volunteer access. Ultimately, the Evergreen Project has taught us valuable lessons in coding, teamwork, and the application of computer science to real-world issues. Through collaboration and innovation, computer scientists have the potential to create positive change in the world.

Works Cited

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