**FINAL REQUIREMENTS**

**IC 217 – Data Structures**

Final Requirement: Project Development

After learning varied data structures, a team of three or four members is tasked to create a programming solution that is relevant and timely to global issues or concerns. It may be in the field of business, health, economics, and others. The programming solution must contain at least three data elements or fields, and will use hash table or hash map.

Documentation/Manuscript is required to discuss what global issue or concern that is considered in the project and why. Provide good references.

Program Requirements:

* Use GUI.
* Maintain persistent data/files as back-up. (may use csv, text files, or databases)
* Use hash map or table as main data structure.

Deliverables will include the following:

* + Documentation/Manuscript
  + Complete Program/Source Code
  + 10-minute video presentation of the project where each member is given time to discuss section/part of the presentation
  + ​

Deadline is on or before December 29, 2023. Below is a guide how the project is being assessed.

1. **LEARNING EVIDENCE:**

As evidence of attaining the above learning outcomes, the student has to do and submit the following:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Learning Evidence** | **Description and other Details** | **Course Outcomes it represents** |
| LE1 | Project 1 | A programming project demonstrating the ability to analyze, design, apply and use the appropriate data structures to solve a computing problem. | CO1 |

1. **Measurement System**

**Learning Evidence 1: Project 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Area to Assess** | **Exceptional** | **Acceptable** | **Amateur** | **Unsatisfactory** |
| Problem Identification, Analysis and Evaluation | * Identifies and   demonstrates a sophisticated understanding of the main issue in the case study.   * Presents an   insightful and thorough analysis of the main issue. | * Identifies and demonstrates an accomplished understanding of the main issue in the case study. * Presents a thorough analysis of the main issue. | * Identifies and   demonstrates an acceptable understanding of the main issue in the case study   * Presents a superficial analysis of the main issue. | * Identifies and demonstrates a weak understanding   of the main issue in the case study.   * Presents an incomplete analysis of the main issue. |
| Design and Implementation   * Reusability * Readability * Efficiency | * The code could be reused as a whole, or each routine could be reused. * The code is exceptionally well organized and very easy to follow * The code is extremely efficient without sacrificing readability and understandability. | * Most of the code could be reused in other programs. * The code is fairly easy to read. There are Minor issues such as inconsistent indentation, variable naming, general organization. * The code is fairly efficient without sacrificing readability and understandability. | * Some parts of the code could be reused in other programs. * The code is readable only by someone who knows what it is supposed to be doing. At least one major issue that makes it difficult to read. * The code is brute force and unnecessarily long. | * The code is not organized for reusability. * The code is poorly organized and very difficult to read. Several   major issues that make it difficult to read.   * The code is very long and appears to be patched   together. |
| Program Correctness | The program works and meets all of the specifications. | The program works and produces the correct results and displays the correctly. It  also meets most of the other specifications. | The program produces correct results but does not display them correctly. | The program is producing incorrect results. |
| Documentation | The documentation is well written and clearly explains what the code is accomplishing and how. | The documentation consists of embedded comments and some simple header documentation that is somewhat useful in understanding the code. | The documentation is simply comments embedded in the code with some simple header comments separating routines. | The documentation is simply comments embedded in the code and does not help the reader understand the  code. |
| Timeliness | The program was submitted on time. | The program was submitted a day after the due date. | The code was submitted two days after the due date. | The code was submitted three or more days after the due date. |

Prepared by:

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IC 217 Instructor

All Day Fade:  
Integrated Booking Management System  
(Desktop Application)

In partial fulfillment of the Final Requirement for the Course IC 217 -   
Data Structures: Learning Evidence presented to **VERA KIM S. TEQUIN**

A.Y 2023 – 2024

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December 2023

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**Problem Domain**

1. **Introduction to the Problem**

In the age of instant gratification and online convenience, barber shops must navigate the ever-evolving digital landscape to stay afloat. A clunky, outdated website can be a major turn-off for tech-savvy clients, while the absence of an online booking system can leave frustrated customers seeking appointments elsewhere. A 2020 study by the National Barber Association found that 78% of customers now book their appointments online, making a user-friendly booking system a non-negotiable element for any modern barbershop. (National Barber Association, 2022). Although not widely publicized, the wait at the local barbershop can be stressful as well. The traditional system of keeping a mental wait has its flaws

Without a booking management system, businesses with appointments - like barbershops - face numerous global challenges: inefficient scheduling leading to lost revenue and customer frustration (Zendesk, 2023), communication gaps causing missed appointments and negative reviews (GetApp, 2022), and manual processes hindering scalability and growth (Acuity Scheduling, 2023). These issues, magnified across countless industries, contribute to economic inefficiencies and hinder customer satisfaction worldwide.

With a growing customer base and increasing demand for their services, it became crucial for the barbershop to streamline their booking process and ensure that appointments were managed effectively. The barbershop industry has seen a rise in competition with the emergence of new salons and grooming services. Barber Shops need to differentiate themselves by offering unique services or targeting specific niche markets. They can also focus on building strong relationships with their existing customers through personalized experiences and exceptional customer service.

Lacking a booking management system can cripple appointment-reliant businesses like barbershops. Inefficiency reigns, with messy scheduling leading to double bookings, missed appointments, and frustrated customers. This mess translates to poor experiences with long wait times, limited booking options, and rescheduling hassles. Operationally, it's data blind, inefficiently staffing, and burdens employees, ultimately hindering growth and impacting the bottom line. Thankfully, adopting a booking system tackles these challenges head-on, paving the way for improved efficiency, happier customers, and a thriving business. (ZipSchedule, 2023)

All Day Fade Barbershop is a popular barbershop that has gained a significant reputation since its establishment in 2021. With a focus on providing high-quality haircuts and exceptional customer service, All Day Fade has quickly become a go-to destination for individuals looking for a top-notch grooming experience. One of the key challenges that All Day Fade Barbershop faced was managing their bookings efficiently.

In all cases, the focus of achieving customer satisfaction, specifically for barbershops, lies on the capabilities of the service personnel. Queuing is one part of the whole experience, which could add good impressions and create the foundation for a good start into an individual’s service encounter.

The absence of a convenient and fair queue management could cause anger and dissatisfaction for store visitors. However, customer satisfaction after the store visit depends on the degree of

expectation fulfilment, the competence and friendliness of employees, and on whether customers are persuaded that they made a good deal or their problem has been solved. Furthermore, the decision to develop the "All Day Fade Desktop Application" is driven by the aspiration to overcome existing challenges and enhance the desktop application. This involves improving overall performance, introducing robust offline booking capabilities, and ensuring a seamless user experience through the advantages of a desktop application and achieving customer satisfaction.

1. **System Overview**

We humbly introduce **All Day Fade Booking Desktop Application,** a powerful and user-friendly solution designed to revolutionize your digital experience. With its sleek interface and cutting-edge features, the app is here to enhance productivity, simplify tasks, and elevate your workflow to new heights.



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*Figure 1: All Day Fade Logo Figure 2: IntelleX Logo*

All Day Fade Desktop Application designed to enhance productivity and streamline tasks. With its user-friendly interface, users of all levels can easily navigate and utilize its features. The application offers a range of functionalities, including task management, file organization, customization options, collaboration tools, and data security. The application is compatible with multiple operating systems and integrates with popular productivity tools, ensuring a seamless workflow. Regular updates and support are provided to ensure the application remains up-to-date and meets users' evolving needs. Experience a new level of productivity and efficiency with the feature-rich desktop application.

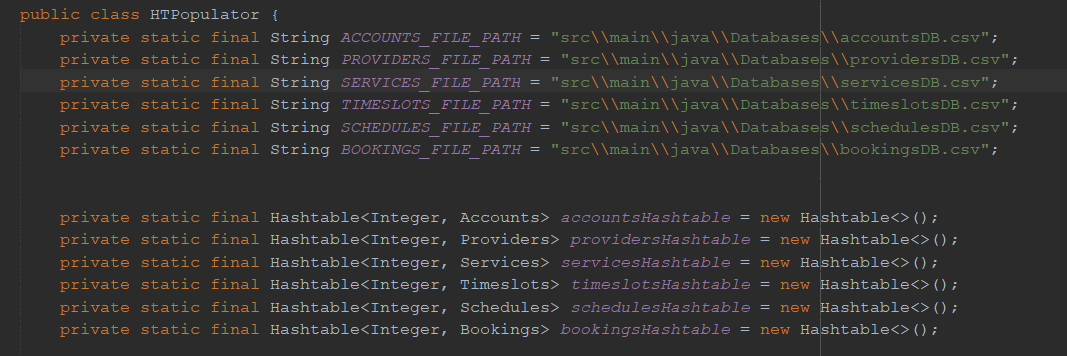
This desktop application is not just a scheduling app for their next haircut – it's a comprehensive solution for managing the entire barbershop experience from the convenience of one's phone. Users can envision a sleek and user-friendly platform that empowers them to explore various styles and services, and secure appointments with just a few taps. The transition to the desktop application effectively addresses identified challenges, presenting improved performance, offline capabilities, and an enhanced user interface. The emphasis on realistic time slots is paramount to preventing scheduling conflicts, ensuring customers arrive at the appropriate time, and ultimately enhancing overall customer satisfaction. This initiative is in alignment with Barbershop's steadfast commitment to providing a top-notch booking experience for both customers and barbers.

The integration of a Booking Management system within the *All Day Fade* desktop application offers significant benefits. It allows for centralized management of bookings, streamlining the scheduling and coordination of appointments. This integration enhances operational efficiency by preventing double bookings and providing real-time updates and notifications to customers. Additionally, it enables businesses to gain insights into booking trends and customer preferences through data analysis and reporting. The integrated Booking Management system ultimately improves customer experience, optimizes resource utilization, and increases revenue opportunities.

*All Day Fade* Booking Application transcends being a mere appointment app; it represents a community of style-savvy individuals and the skilled barbers who help them maintain a sharp look. It encapsulates convenience, discovery, and the assurance of leaving the barbershop feeling like the best version of oneself. However, the app offers more than just booking capabilities. Users can immerse themselves in detailed profiles of each barbershop, perusing portfolios showcasing fades, tapers, and intricate designs. They can gauge the ambiance through photos and reviews, ensuring a perfect match for their style. The app enables users to schedule recurring appointments with their preferred barber or explore new talent based on location, rating, or specific skills.

**Use of Hash Table of the Project**

The use of hash tables is critical in our software, as demonstrated by the functionality of the "HTPopulator" class, which is designed to handle objects, each with unique properties that are unique to their respective classes. The hash table's principal goal is to function as a complex data structure that effectively handles and organizes information related with these many items. The seamless transfer of data from the database to the designated hash tables is a distinguishing feature of our implementation. This strategic use of hash tables improves the program's computational efficiency and allows for faster information retrieval during runtime.



*Figure 3. HTPopulator initizalizion of filepath for each Entities Database*.

The first component of the code is dedicated to defining file paths for various kinds of databases, which include key entities such as accounts, providers, services, timeslots, schedules, and reservations. These file locations serve as the foundation for interfacing with specific datasets linked with each object. Following that, the lines of code that follow create numerous hash tables, complex data structures known for their quick data retrieval capabilities. These hash tables are used to conveniently store and manage the various datasets collected from the specified databases. The code enhances the speed of data access by utilizing hash tables, hence improving the overall efficiency of the program's activities. The purposeful use of hash tables indicates a wise choice in data storage mechanism structure, confirming to a systematic approach.

Furthermore, the creation of various hash tables demonstrates the program's flexibility in supporting diverse data structures customized to the unique characteristics of each object. This modular architecture enables the code to gather and arrange information about accounts, suppliers, services, timeslots, timetables, and reservations. The use of hash tables strategically not only streamlines the code's operation but also strengthens its scalability and adaptability, placing it as a solid option for managing varied information inside the defined file directories.

**User Interface**

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| --- |
| **Landing Page:**  The Landing Page seamlessly guides users into the app's ecosystem, providing a user-friendly introduction that sets the stage for a positive and intuitive user experience |
| ***Landing Page*** |
| **Sign Up/Log-In Page:**  The Sign Up/Log In page is the gateway to our system, facilitating user access with a seamless authentication process. New users can swiftly register by providing essential details, while existing users can effortlessly log in to access personalized features. This essential entry point ensures a secure and user-friendly experience, laying the foundation for interaction with our system's functionalities. |
| ***Sign Up/Log-In*** |
| **Dashboard**: The Dashboard serves as a centralized hub in our system, providing quick access to key functionalities. Users can navigate seamlessly through the About Us Page, view Business Hours, manage Staff, explore Services, schedule Appointments, and access their User Profile. This streamlined interface ensures efficient interaction and enhances user experience. |
| ***Dashboard*** |
| **Barber Selection:**  Barber Selection streamlines the process of choosing a barber, ensuring users find their preferred stylist based on expertise, ratings, and availability. The system enhances user experience by providing a seamless and efficient way to connect with skilled barbers, facilitating a personalized grooming experience. |
| ***Barber Selection*** |
| **Book Appointment:**  Our system streamlines the barber appointment process, allowing users to effortlessly select their preferred barber, choose a specific service, and schedule the appointment for a designated date and time. This user-friendly interface ensures a seamless booking experience, enhancing convenience and efficiency in managing salon appointments. |
| ***Book Appointment (Select Barber)*** |
| ***Book Appointment (Select Service)***    ***Book Appointment (Select Preferred Date and Time)*** |
| **Services**: Services within a system refer to distinct functionalities or features that cater to specific user needs. These services are individual components designed to perform specialized tasks, enhancing the overall functionality and efficiency of the system. Each service serves a unique purpose, collectively contributing to a comprehensive and seamless user experience. |
| ***Services*** |
| **Profile Page:**  The Profile Page within the system offers a comprehensive view of past and upcoming appointments, providing users with a seamless experience for managing their schedules. Users can conveniently book appointments directly from this page. Additionally, the Profile Page features an Account Settings section for personal information customization, ensuring a personalized and user-centric interface. The option to exit the system is also readily available for user convenience. |
| ***Profile Page (Personal Upcoming and Past Appointments)***    ***Profile Page (Edit Personal Informations)*** |

**References**

Revfine.com, & Revfine.com. (2023, May 19). *Why is an Integrated Online Booking System Important? | Revfine.com*. Revfine.com. <https://www.revfine.com/why-is-an-integrated-online-booking-system-important/>

*Book Your Appointment with AllDayFade*. (2023). Setmore.com. <https://alldayfade.setmore.com/>

*Creating and managing appointments for leads, contacts, and deals*. (2023, April 11). Zendesk Help. <https://support.zendesk.com/hc/en-us/articles/4408843583002-Creating-and-managing-appointments-for-leads-contacts-and-deals>

*Best Online Appointment Booking Software - Appointy*. (2022, August 29). Online Scheduling Software. <https://www.appointy.com/online-booking-software/>

Goldberg, A. (2019, October 22). *What are the pros and cons of Acuity Scheduling? The pros and cons of Acuity Scheduling are its user-friendly,.* Financesonline.com; FinancesOnline.com. <https://financesonline.com/pros-and-cons-of-acuity-scheduling/>

Goodrich, M. T., Tamassia, R., & Goldwasser, M. H. (2014). *Data Structures and Algorithms in Java*. Retrieved from <http://bedford-computing.co.uk/learning/wp-content/uploads/2016/08/Data-Structures-and-Algorithms-in-Java-6th-Edition.pdf>