LuSXuC

CS5200 Fall23

Beauty Tracker Project Final Report

I. Technical Specification

Software Requirements

Development Environment

- Java Development Kit (JDK):
- Version: JDK 11 or later
- Purpose: Required for developing and running Java applications
- Download: Oracle JDK

Database

- MySQL Server:
- Version: 5.7 or later
- Purpose: To store and manage application data
- Download: MySQL Community Server

JDBC Driver

- MySQL Connector/J:

- Purpose: JDBC driver for MySQL, enabling Java applications to interact with the MySQL database
- Included with MySQL Server or available at MySQL Connector/J, in Java, put within the same folder with the class

Integrated Development Environment (IDE)

- Any modern IDE that supports Java development, such as:
- In our case, IntelliJ IDEA

Hardware Requirements

- Processor: Intel Core i3 or better (or equivalent)
- Memory: Minimum 4 GB RAM (8 GB recommended)
- Storage: At least 1 GB of free disk space
- Network: Active internet connection for downloading dependencies and updates

Operating System

- Compatible with Windows, macOS, and Linux
- Ensure that the chosen JDK and MySQL Server versions are compatible with the operating system

Database Schema

- Structured with multiple tables including product, brand, type, concern, function_table, ingredient, and package
- Relations and constraints are defined as per the project's database design. Please see other sections for details

Source Control

- Git: For version control
- Repository hosting on GitHub

Security Measures

- Secure storage and handling of database connection details including username and password. In our case, we applied encryption on our password for pushing onto GitHub public repository.
- Input validation to prevent SQL injection and other common security vulnerabilities

Performance and Scalability

- Designed for efficient handling of moderate-sized data sets

II. Lessons Learned

Throughout the duration of the BeautyTracker project, our team gained extensive experience and skills in Java programming, particularly in the area of JDBC for database interactions. This project served as a practical platform to enhance our understanding of how to effectively organize Java code using classes and packages, which is crucial in object-oriented programming. The hands-on experience significantly deepened our knowledge and proficiency in this programming paradigm.

A significant portion of our learning journey involved working with MySQL. Here, we honed our skills in database design, learning the intricacies of creating tables and crafting efficient SQL queries. We navigated the complexities of handling foreign key constraints, which, although challenging, provided us with invaluable insights into maintaining data integrity and the interrelationship between various data entities. This aspect of the project was particularly

enlightening, as it underscored the importance of relational database principles in real-world applications.

Time management emerged as a crucial lesson from this project. We learned the importance of breaking down the project into smaller, manageable tasks, and the necessity of setting achievable deadlines. This approach was instrumental in balancing various aspects of the project development, including coding, testing, and debugging. By avoiding feeling overwhelmed, we were able to maintain a steady pace and ensure consistent progress throughout the project's lifecycle.

Delving into the beauty product application domain allowed us to deepen our understanding of this specific field. We discovered the critical role that user-friendly data presentation plays and how well-structured and organized data can significantly enhance an application's usability. This aspect of the project brought to light the real-world implications of our work and the importance of aligning technical development with user needs and experiences.

Collaboration and teamwork were central to the success of this project. We learned to efficiently allocate tasks based on each team member's strengths and skills. This facilitated effective project management and progress. Regular team meetings and maintaining open lines of communication were fundamental in overcoming the challenges we faced. These interactions not only helped in problem-solving but also fostered an environment where constructive feedback was shared, leading to continuous improvement and refinement of our final product.

As we navigated through the project, we considered various possibilities for enhancing our application. A key idea was the development of a web-based interface, which we believed could make the application more accessible and user-friendly. We contemplated using Spring Boot for the backend and HTML/CSS for the frontend to achieve this. However, due to time constraints, this goal remained unfulfilled. The integration of external APIs for functionalities such as real-time price updates and the potential use of a cloud-based database for better scalability and accessibility were other exciting ideas we explored. These considerations remain as future goals, which we hope to achieve as we continue to develop and expand the capabilities of BeautyTracker.

Another technical consideration we grappled with was determining the nullability of certain pieces of information in our database. Deciding whether a piece of data can be left empty (null) required careful consideration of its impact on the overall database structure and application functionality.

We also spent considerable time evaluating our application from the user's perspective to ensure a smooth and intuitive user experience. Implementing functionalities for different currencies and units like milliliters (ml) and liters (l) was part of this effort. These features were aimed at enhancing the user experience and adding a layer of professionalism to our application.

Moving forward, one area we seek to improve is the sophistication and comprehensiveness of our database. While we aimed to create an application with functionalities akin to popular productivity tools like Notion – easy to use and aesthetically pleasing – we recognize that our current implementation may not cover all potential user scenarios. Expanding the application's capabilities to accommodate a wider range of functionalities while maintaining ease of use and aesthetic appeal is a key goal for future development.

In conclusion, the BeautyTracker project has been a journey of technical growth, problem-solving, and user-centric development. Each challenge we encountered provided us with deeper insights and a clearer direction for future enhancements. Our ambition is to evolve the application into a more advanced and user-friendly tool, catering to a wider range of user needs and preferences.

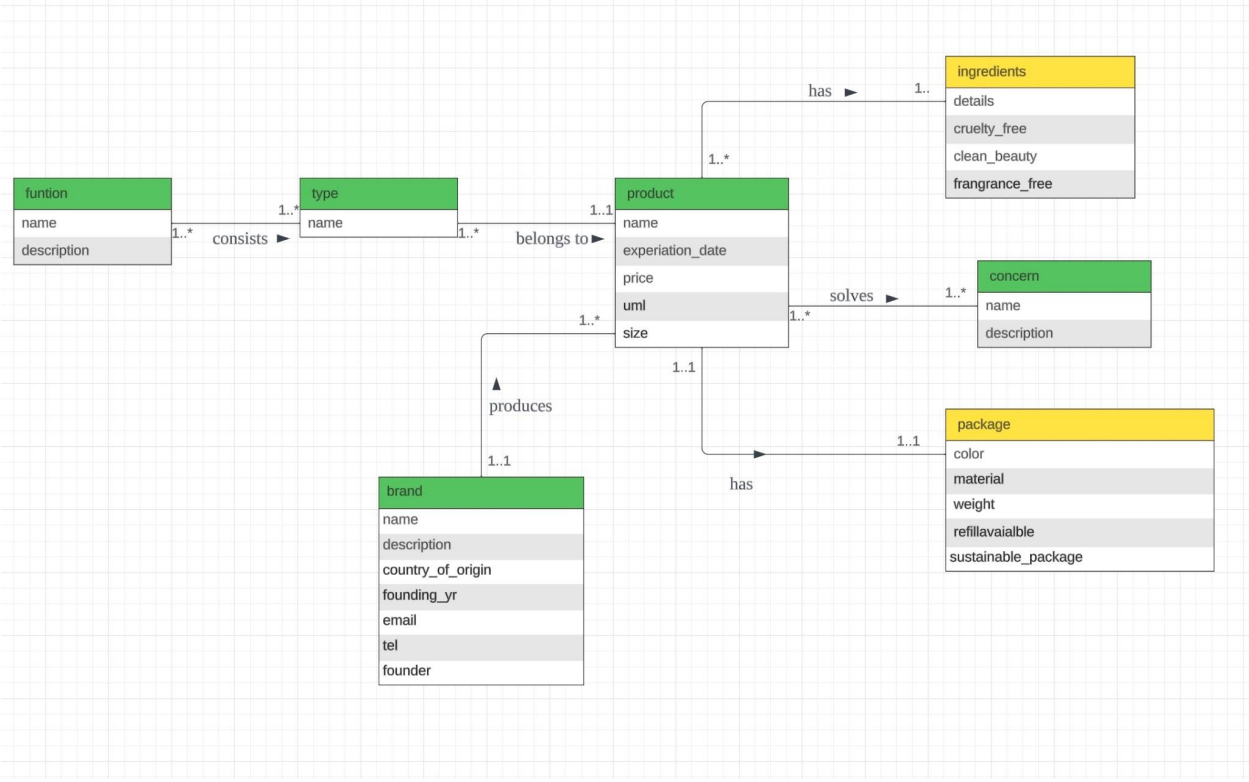
III. Future Work

In our ongoing efforts to enhance BeautyTracker, we envision several key improvements and expansions. Our database will be enriched with more detailed product information, including customer reviews and inventory levels, to better manage stock and understand consumer preferences. We also plan to introduce user account management, enabling us to track user preferences and activities for personalized product recommendations. Furthermore, we aim to leverage our database for analytics to gain insights into sales trends and product popularity.

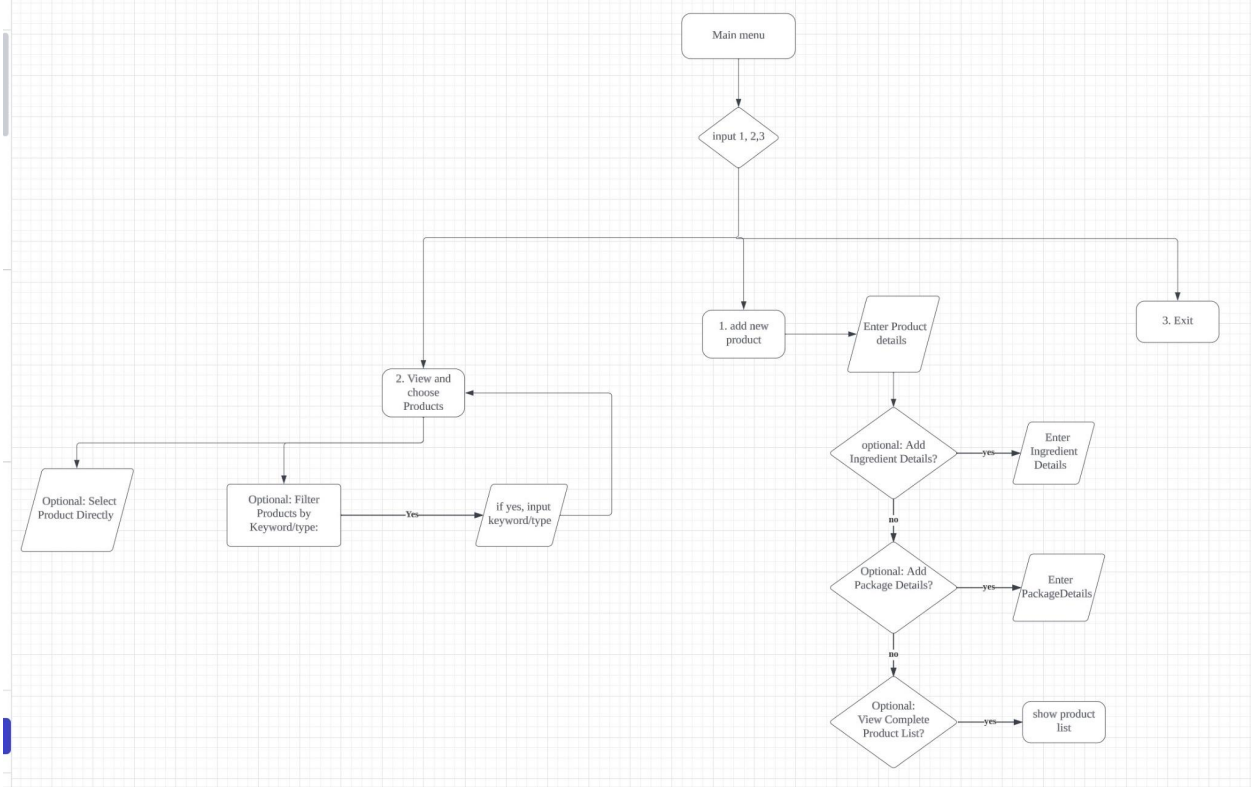
In terms of new features, we are considering integrating online shopping capabilities, allowing users to purchase or restock products directly through the app. Developing a mobile version of BeautyTracker is also on our agenda, which would increase accessibility and user engagement. The potential use of AI for personalized product recommendations is an exciting avenue we're exploring. Additionally, building APIs for integration with other apps and making the app globally available in multiple languages and regions are part of our future roadmap.

These enhancements are driven by the ever-evolving nature of the beauty industry and the technological landscape. We believe that continually updating the app with new features and functionalities will not only keep it relevant and useful for users but also help us expand our reach and adapt to changing user needs.

IV. UML



V. Flowchart


Main menu
input 1, 2,3
1. add new product
Enter Product details
3. Exit
2. View and choose Products
optional: Add Ingredient Details?
yes
Enter Ingredient Details
no
Optional: Select Product Directly
Optional: Filter Products by Keyword/type:
Yes
if yes, input keyword/type
Optional: Add Package Details?
yes
Enter PackageDetails
no
Optional: View Complete Product List?
yes
show product list