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PROJECT REPORT

Student Name: Gaurav Monga

Branch: BE-AIT-CSE

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Subject Name: Full Stack

UID: 23BAI70156

Section/Group: 23AIT_KRG-1 A

Subject Code: 23CSP-339

Project Name: Expense Tracker

1. **Introduction:**

This Full Stack Project is based off expense trackers that allow us to manage our daily expenses and understand where all our finances in detail side by side as different transactions happen. This allows us to get an comprehensive understanding of our funds along with profits and losses for a given time period.

This project is one of the projects which is the most helpful in recent times and many people use different UPI apps in the day and it is simply not possible to track all the transactions in the myriad of UPI apps downloaded in our mobile phones. This project helps us to easily jot down where our expenses have been used throughout the day so that we do not forget where we have paid and where not.

2. **Technologies Used and Methodology:**

The repository is organized into two main components: a backend server and a frontend client.

- `/backend`: A Java-based RESTful API built with the Spring Boot framework.

- `/frontend`: A single-page application (SPA) built with the React.js library.

Backend Details (`/backend`)

The backend is responsible for business logic, data persistence, and security.

- **Language:** Java 21
- **Core Framework:** Spring Boot 3.2.1
- **Build Tool:** Apache Maven
- **Primary Responsibilities:**
   - User authentication and authorization using JWT.
   - CRUD operations for expenses, categories, and budgets.
   - Data validation and exception handling.
   - Serving data to the frontend client.
- **Key Libraries & Dependencies:**
   - **Spring Web:** For creating REST controllers.
   - **Spring Data JPA:** For object-relational mapping (ORM) with the database.
   - **Spring Security:** To secure the API endpoints.
   - **MySQL Connector:** To connect to a MySQL database.
   - **Java JWT (jjwt):** For creating and verifying JSON Web Tokens.
   - **Spring Boot Mail:** For email-related functionalities like password recovery.
   - **Lombok:** To reduce boilerplate code for model classes.

Frontend Details (`/frontend`)

The frontend provides the user interface for interacting with the expense tracker.

- **Core Library:** React.js 18.2
- **Build Tool:** Vite
- **Package Manager:** npm
- **Primary Responsibilities:**
   - Displaying user dashboards, transaction lists, and reports.
   - Providing forms for creating and editing expenses.
   - User registration and login.
   - Visualizing data using charts.
- **Key Libraries & Dependencies:**

- **Axios:** For communicating with the backend REST API.
- **React Router DOM:** For navigating between different pages/views within the application.
- **Recharts:** For rendering charts and graphs (e.g., income vs. expense).
- **React Hook Form:** For managing form state and validation efficiently.
- **React Hot Toast:** For displaying user-friendly notifications.

3. **Future Scope:**

The project has a great future scope as it keeps getting harder and harder to manage and track all out expenses due to various different payment options such as upi, cash, upi wallets credit cards etc. All of this makes it harder to understand the expenditure in a month but this project helps us to counter that and make sure that everyone is updated with their payments and understands where, when and for what they are paying a specific amount of money.