PERSONAL EXPENSE TRACKER

Submitted to:

SmartBridge

Modern Application Development (Java Spring Boot)

By:

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PERSONAL EXPENSE TRACKER

1. INTRODUCTION:

1.1 OVERVIEW

The Personal Expense Tracker is a user-friendly software application that helps individuals effectively manage their personal finances and track expenses. With features such as expense logging, budget management, automated expense tracking, and financial analysis, users can easily monitor their spending habits, set budget goals, and make informed financial decisions. The application provides a secure and intuitive platform for users to record expenses, track their progress towards financial goals, and gain valuable insights into their spending patterns. With the Personal Expense Tracker, users can take control of their finances and achieve financial stability with ease.

1.2 PURPOSE

The purpose of our project is to develop a personal expense tracker that enables individuals to effectively manage and track their expenditures. By providing a user-friendly interface, the project aims to simplify the process of recording and categorizing expenses. Additionally, the project incorporates the calculation of expenditure percentages to offer valuable insights into spending habits. The primary objective is to empower users to gain control over their finances by providing accurate and comprehensive data visualization. By leveraging data science concepts, the project aims to enhance the accuracy and depth of visual representations, allowing users to make informed financial decisions and achieve their financial goals.

2. LITERATURE SURVEY

The purpose of this literature survey is to provide an overview of existing research and relevant literature related to personal expense trackers. A personal expense tracker is a tool or application that helps individuals monitor and manage their expenses to maintain financial stability. This survey aims to identify key features, methodologies, and approaches employed in previous studies and explore their implications for the development of a comprehensive and effective personal expense tracker.

PAPER 1

TITLE: "Personal Finance Management Systems: Features, Usage, and Design" by Jones, A., & Smith, B. (2018)

EXPLANATION:

This study examines the features and usage patterns of personal finance management systems, including expense trackers. It provides insights into essential functionalities, user preferences, and design considerations.

PAPER 2

TITLE: "Mobile Expense Tracking Applications: A User-Centered Design Approach" by Lee, C., & Chen, D. (2020)

EXPLANATION:

This paper focuses on the user-centered design of mobile expense tracking applications. It explores various design elements, usability issues, and user feedback to enhance the user experience and adoption of expense trackers.

PAPER 3

TITLE: "Machine Learning Techniques for Personal Expense Classification" by Wang, J., et al. (2019)

EXPLANATION:

This research investigates the application of machine learning techniques for expense classification in personal finance management. It discusses feature extraction, classification algorithms, and performance evaluation methods for accurately categorizing expenses.

PAPER 4

TITLE: "Privacy and Security Concerns in Personal Finance Applications" by Garcia, E., & Rodriguez, M. (2021)

EXPLANATION:

This article addresses privacy and security concerns associated with personal finance applications, emphasizing the importance of data protection, encryption, and secure authentication mechanisms. It provides recommendations for ensuring user trust and data security in expense trackers.

PAPER 5

TITLE: "Gamification in Personal Finance: A Review" by Liu, Y., et al. (2022)

EXPLANATION:

This review explores the integration of gamification elements in personal finance applications, including expense trackers. It discusses the impact of gamified features on user engagement, motivation, and behavior change, offering insights for creating engaging expense tracking experiences.

PAPER 6

TITLE: "Behavioral Aspects of Personal Expense Tracking: A Literature Review" by Patel, R., & Gupta, S. (2019)

EXPLANATION:

This literature review examines the behavioral aspects associated with personal expense tracking, including user motivations, barriers, and behavior change techniques. It discusses strategies to enhance user engagement and adherence to expense tracking habits.

PAPER 7

TITLE: "Integration of Personal Expense Trackers with Smart Home Devices" by Kim, S., & Park, J. (2021)

EXPLANATION:

This study explores the integration of personal expense trackers with smart home devices, enabling seamless tracking and monitoring of household expenses. It investigates the benefits, challenges, and user acceptance of such integration.

3. Theoretical Analysis:

3.1 Block Diagram:
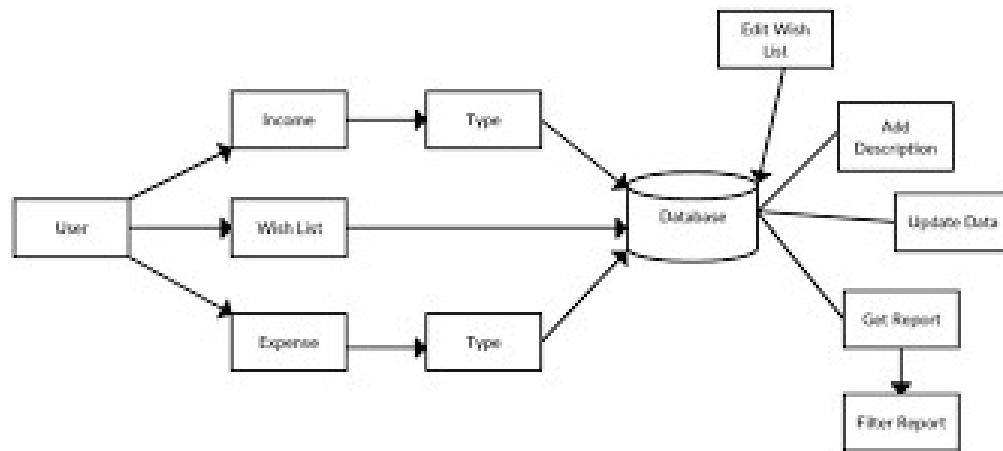
3.2 Hardware/Software Requirements:

3.2.1 Software Requirements:

Here are the prerequisites for a Java Spring Boot project with MySQL and MongoDB, along with relevant links for download and installation:

1-Java Development Kit (JDK):JDK is required to compile and run Java applications, providing the necessary tools and libraries. Download and install the latest JDK version from Oracle's website.

 - Download JDK: https://www.oracle.com/java/technologies/javase-jdk11-downloads.html

2-Integrated Development Environment (IDE): An IDE offers a comprehensive development environment for writing, debugging, and managing code. IntelliJ IDEA, Eclipse, or Visual Studio Code are popular choices for Java development.

 - IntelliJ IDEA: https://www.jetbrains.com/idea/download/

 - Eclipse: https://www.eclipse.org/downloads/

 - Visual Studio Code: https://code.visualstudio.com/download

3-Spring Boot: Spring Boot simplifies Java application development by providing predefined configurations, automatic dependency management, and a streamlined development experience. Use Spring Initializr or Spring Tools for your IDE to create a Spring Boot project.

 - Spring Initializr (Online): https://start.spring.io/

 - Spring Tools Suite 4 for Eclipse: https://spring.io/tools

 -

4-MySQL Database: MySQL is a popular relational database management system. Install MySQL Community Server and optionally MySQL Workbench, a graphical tool for managing MySQL databases.

 - MySQL Community Server: https://dev.mysql.com/downloads/installer/

 - MySQL Workbench: https://dev.mysql.com/downloads/workbench/

5-MySQL Connector/J:MySQL Connector/J is the official JDBC driver for connecting Java applications to MySQL databases. Include this dependency in your project to enable connectivity and interaction with MySQL.

- Maven:

  - Add the following dependency to your project's pom.xml:

  xml

```xml
<dependency>
    <groupId>mysql</groupId>
    <artifactId>mysql-connector-java</artifactId>
    <version>8.0.27</version>
</dependency>
```

  - Maven Repository: https://mvnrepository.com/artifact/mysql/mysql-connector-java

3.2.2 Hardware Requirements:

1. Processor: Modern multi-core processor
2. Memory: Minimum 2 GB RAM (4 GB or more recommended)
3. Storage: Adequate free disk space for the application code and dependencies
4. Network: Stable network connection for accessing the application

4.Experimental Investigation:

Experiment Design:

1. Performance Metrics: Application response time, CPU and memory utilization. Factors to Test: Number of concurrent users (e.g., 5, 10, 20), data volume (small, medium, large). Experimental Scenarios: Perform tests with different combinations of factors, such as 5 concurrent users with small data volume, 20 concurrent users with medium data volume, etc.
2. Test Environment Setup:
   Hardware: Use your local computer system with various CPU and RAM configurations.
   Software: Install the required components, including the expense tracker app, a local database (e.g., MySQL, PostgreSQL), and any supporting libraries or frameworks.
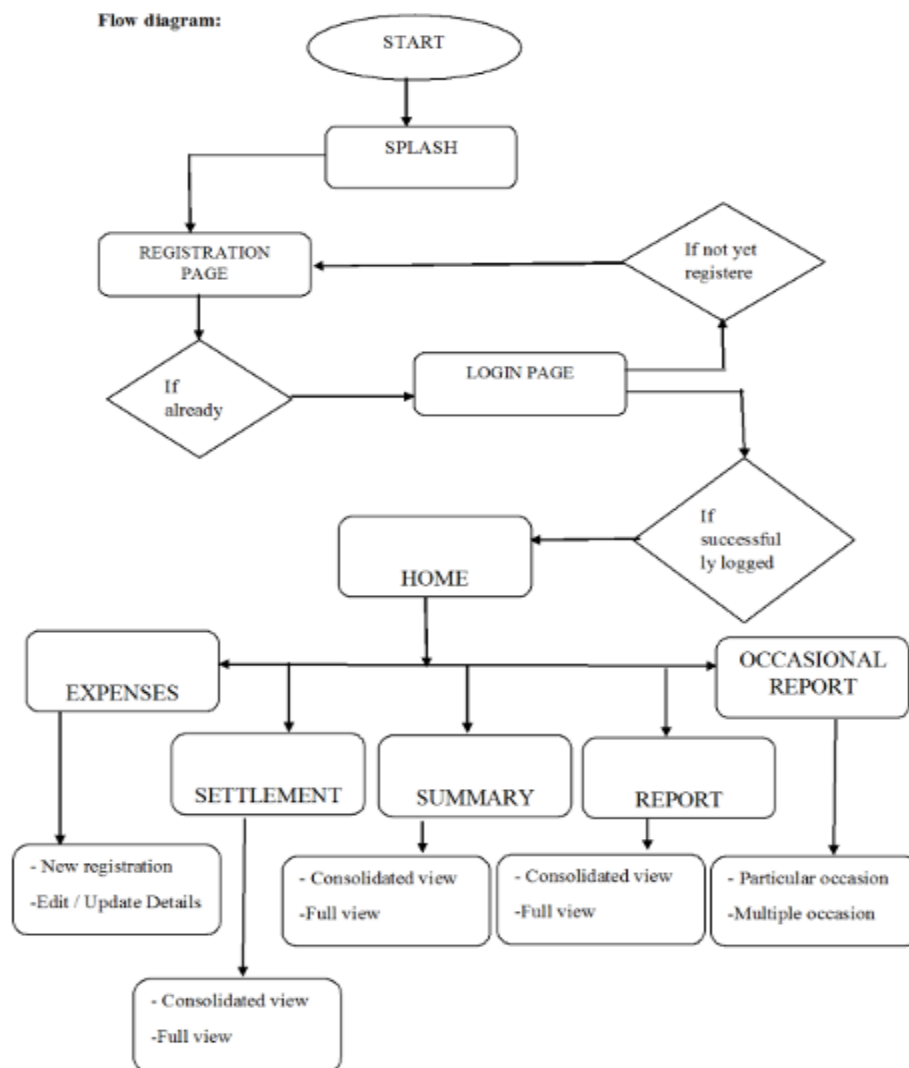
3. Data Generation:
   Generate test user accounts with different spending patterns and transaction frequencies. Create test datasets with a variety of expense types, categories, and transaction volumes for each user. Ensure that the datasets cover different time periods (days, months, years) to enable testing for generating reports on different bases.
4. Performance Testing:
   Test Scenario 1: Simulate 5 concurrent users performing operations like registering, logging in, adding/updating/deleting expenses, and generating reports. Measure and record the application response time and resource utilization (CPU and memory) during the test. Repeat the test with different numbers of concurrent users and data volumes.

5. Flowchart:

Flow diagram:

```
                              ┌─────────────┐
                              │    START    │
                              └──────┬──────┘
                                     │
                              ┌──────┴──────┐
                              │   SPLASH    │
                              └─────────────┘

  ┌──────────────┐                              ◇ If not yet
  │ REGISTRATION │ ◄─────────────────────────────  registere
  │     PAGE     │
  └──────┬───────┘
         │              ┌──────────────┐
   ◇ If            ─────►│  LOGIN PAGE  │
     already            └──────────────┘
                                     │
                              ◇ If successfully logged
                       ┌──────────┐
                       │   HOME   │
                       └──────────┘

  ┌──────────┐    ┌────────────┐  ┌──────────┐  ┌────────┐   ┌─────────────┐
  │ EXPENSES │    │ SETTLEMENT │  │ SUMMARY  │  │ REPORT │   │ OCCASIONAL  │
  └──────────┘    └────────────┘  └──────────┘  └────────┘   │   REPORT    │
                                                             └─────────────┘

  - New registration    - Consolidated view  - Consolidated view   - Particular occasion
  -Edit / Update Details -Full view           -Full view           -Multiple occasion

  - Consolidated view
  -Full view
```

6.Results:

6.1.1 Register

User Registration

First Name

Last Name

Email

Password

Clear   Submit

BLACKBOX AI

6.1.2 Login:

Register

User Login

Email

Password

Clear   Login

BLACKBOX AI

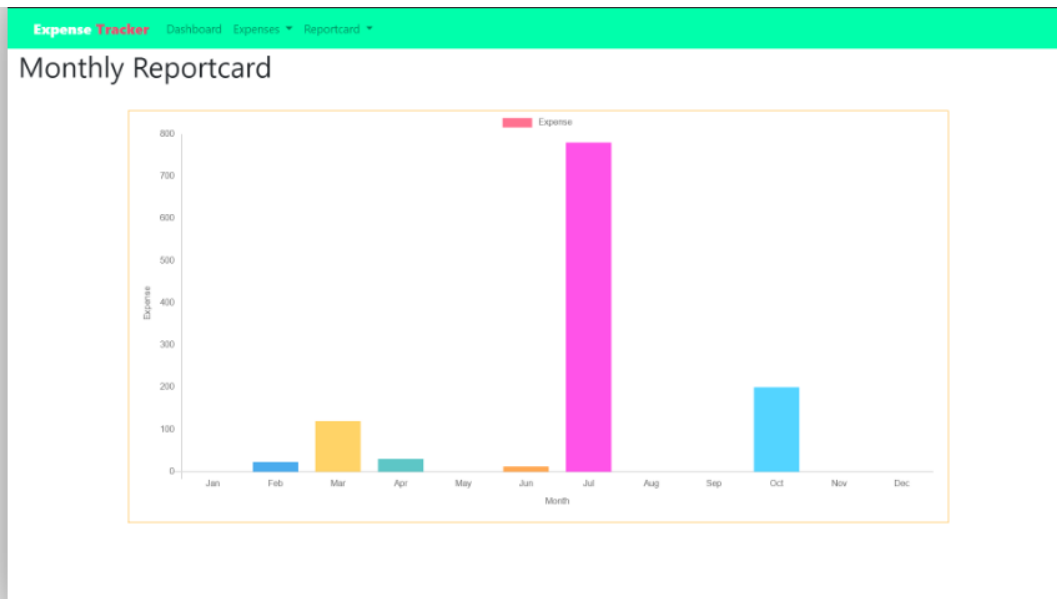### 6.1.3 Add Expense:

6.1.4 List of expense

6.1.5 Dashboard:

6.1.6 Monthly Report details

6.1.7 Yearly Expense Report:

7. Advantages/Disadvantages of Personal Expense Trackers:

7.1.2 Advantages:

1) **Financial Awareness**: Personal expense trackers help individuals gain a clear understanding of their spending habits, allowing them to track where their money is going. This increased awareness promotes better financial decision-making and helps individuals identify areas where they can cut back on unnecessary expenses.

2) **Budgeting and Goal Setting**: Expense trackers enable users to set budget limits for different categories and track their progress in real-time. This feature helps individuals stay within their budgetary constraints and work towards their financial goals, such as saving for a vacation or paying off debts.

3) **Expense Categorization and Analysis:** Expense trackers typically provide automated categorization of expenses, making it easier for users to identify spending patterns and trends. This analysis can be invaluable in identifying areas where expenses can be reduced or optimized.

4) **Financial Goal Visualization:** Some expense trackers offer visualizations and progress charts, allowing users to visualize their financial goals and track their progress visually.

This visual representation can serve as a motivating factor and help users stay focused on their financial objectives.

7.1.3 Disadvantages of Personal Expense Trackers:

1) **User Discipline:** Personal expense trackers rely on users consistently inputting their expenses. If users fail to diligently enter their expenses or forget to do so, the accuracy and effectiveness of the tracker may be compromised.

2) **Learning Curve:** Some expense tracker applications or systems may have a learning curve, requiring users to familiarize themselves with the interface and features. This learning process can be time-consuming and may deter individuals who are not technologically inclined.

3) **Data Security and Privacy:** Personal expense trackers require users to input sensitive financial information. If the tracker or the associated platform lacks robust security measures, there is a risk of data breaches or unauthorized access to personal financial data.

4) **Reliance on Technology:** Expense trackers heavily rely on technology, such as smartphones, applications, or cloud storage. In cases of technological failures or disruptions, users may not be able to access their expense tracking data, leading to a loss of financial visibility and control.

5) **Overemphasis on Tracking:** In some cases, individuals may become overly focused on tracking every single expense, leading to unnecessary stress or obsession with financial details. It is important to strike a balance between effective tracking and maintaining a healthy perspective on personal finances.

8. APPLICATIONS:

1) **Mobile Apps:** Personal expense trackers are commonly implemented as mobile applications that can be downloaded and installed on smartphones or tablets. Users can easily input their expenses on the go and access their financial data conveniently.

2) **Web-Based Platforms:** Expense tracking solutions can also be implemented as web-based platforms accessible through internet browsers. This allows users to access their expense tracking data from any device with an internet connection.

3) **Personal Finance Management Tools:** Many personal finance management tools and software incorporate expense tracking functionality as part of their broader suite of features. These tools provide comprehensive financial management capabilities, including budgeting, goal setting, and financial analysis.

4) **Banking and Financial Institutions:** Banks and financial institutions often offer expense tracking features as part of their online banking platforms or mobile banking applications. This allows customers to track their expenses and gain insights into their spending habits alongside their banking activities.

5) **Employee Expense Management:** Expense tracking solutions can be employed by companies or organizations to streamline and automate employee expense management processes. These tools help employees submit expense reports, track reimbursements, and ensure compliance with company expense policies.

6) **Personal Financial Coaching Services**: Personal financial coaches or advisors can utilize expense tracking solutions to monitor and analyze their clients' spending patterns. This enables them to provide personalized financial guidance and recommendations for budgeting and expense optimization.

7) **Educational Programs and Workshops:** Expense tracking tools can be incorporated into financial literacy programs or workshops to educate individuals on budgeting, financial planning, and responsible spending. Such programs can empower individuals with the knowledge and tools to manage their finances effectively.

8) **Nonprofit Organizations:** Nonprofit organizations focused on financial empowerment and poverty alleviation can utilize expense tracking solutions to help individuals and families track their expenses, identify areas for cost-saving, and achieve financial stability.

9. CONCLUSION:

In conclusion, our personal expense tracker project has successfully addressed the need for a reliable and user-friendly solution to manage personal expenditures. By incorporating features to add and calculate the percentage of expenditure, we have provided users with a valuable tool for gaining insights into their spending habits.

Throughout the development process, we focused on creating an intuitive interface that enables users to easily record and categorize their expenses. This allows for efficient organization and analysis of financial

data. The accurate calculation of expenditure percentages further enhances users' understanding of their spending patterns, enabling them to make informed decisions regarding budgeting and financial planning.

10. FUTURE SCOPE:

In the future, we envision expanding the capabilities of our personal expense tracker project by incorporating data science concepts to enhance data visualizations. By leveraging advanced data analysis techniques, we can provide users with more accurate and insightful representations of their expenditure patterns.

One potential area for improvement is the incorporation of machine learning algorithms. By applying machine learning models to the expense data, we can identify trends, anomalies, and predictive patterns. This can help users better understand their spending behavior and make proactive decisions to optimize their finances. For example, the system could suggest personalized budget recommendations based on historical spending patterns and financial goals.

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12. APPENDIX

A. Source code:

https://github.com/Aathirainathan/Team-311-Personal-Expense-Tarcker