Mobile Banking System Project Report

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1 Introduction

The **Mobile Banking System** is a fundamental application designed to enable users to perform basic banking tasks using a computer. The primary goal of this project is to create an easy-to-use system that allows users to manage their accounts, conduct transactions, and understand basic banking functionalities. Additionally, this project aims to enhance the developer's programming skills in the C language, with a particular focus on data structures such as linked lists.

2 Objectives

- Develop a system for performing fundamental banking tasks.
- Utilize linked lists for managing users and their transaction histories.
- Ensure account security through usernames and passwords.
- Apply best practices for writing clear and maintainable code.

3 Features of the System

- **User Registration:** Enables users to create new accounts with unique usernames and passwords.
- **Login/Logout:** Allows secure access to user accounts.
- **Deposit Money:** Functionality for adding funds to account balances.
- **Send Money:** Facilitates fund transfers to other registered users.
- **Cash Out:** Allows users to withdraw funds from their accounts.
- **Mobile Recharge:** Enables recharging mobile numbers using account balances.
- **Transaction History:** Maintains records of all transactions for user reference.

- **Account Details:** Displays user account information including username and balance.

4 Technical Approach

- **Programming Language:** The system is implemented in C, chosen for its efficiency and control over memory management.
- **Security:** User accounts are secured using username-password authentication.
- **Memory Management:** Dynamic memory allocation is utilized to efficiently handle user and transaction data.

5 Expected Outcomes

- A functional Mobile Banking System with the outlined features.
- Enhanced proficiency in C programming, particularly in linked lists and dynamic memory allocation.
- A practical demonstration of fundamental banking operations.

6 Implementation Plan

1. **Design:** Define system architecture and features.
2. **Development:** Implement functionalities such as registration, login, deposits, and transactions.
3. **Testing:** Perform error handling and ensure proper operation of all features.
4. **Documentation:** Include code comments and prepare a user guide for the system.

7 Code Overview

The system is implemented in C using a modular approach. Below is an outline of its major components:

Key Functions

- **User Registration:** Registers new users and stores their credentials and initial data.
- **Login:** Authenticates users with their username and password.
- **Deposit Money:** Adds a specified amount to the logged-in user's balance.
- **Send Money:** Transfers funds between users, ensuring sufficient balance and recipient validation.
- **Transaction History:** Records all user transactions (e.g., deposits, transfers) using linked lists.
- **Logout :** Logs out the current user and returns to the main menu.

Data Structures

Transaction:

- Type: Specifies the type of transaction (e.g., deposit, send).
- Amount: Specifies the amount involved in the transaction.
- Next: Points to the next transaction in the list.

User:

- Username: Stores the username of the user.
- Password: Stores the user's password.
- Balance: Stores the current balance of the user.

- Transactions: Points to the user's transaction history.

- Next: Points to the next user in the linked list.

8 Challenges and Solutions

1. Error Handling:

Issue: Handling invalid inputs and operations such as incorrect login credentials.

Solution: Implemented validation checks and error messages to guide users.

2. Dynamic Memory Management:

Issue: Ensuring efficient allocation and deallocation of memory.

Solution: Used ‘malloc‘ and ‘free‘ appropriately to manage memory effectively.

3. Data Security:

Issue: Ensuring user data confidentiality.

Solution: Secured account access with password authentication.

9 Conclusion

The Mobile Banking System provides a practical demonstration of basic banking operations while leveraging the C programming language for efficient data handling. This project has not only met its initial objectives but also offered valuable insights into programming, system design, and security practices. It serves as a foundational step toward developing more complex software systems.

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