



Group activity -01

Banking Management System

Semester: Fall 2024

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Course Code: SE133

Course Name: Software Development Capstone Project

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Submission Date: 14/11/24

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Abstract

This project proposes a simple yet efficient “Banking Management System” developed in the C programming language. The system is designed to manage basic banking operations such as creating new accounts, depositing and withdrawing money, checking balances, and managing account details. This system aims to provide a user-friendly interface and serve as a foundational project for understanding core concepts of system programming, data management, and file handling in C. The project is ideal for educational purposes, demonstrating how C can be used in managing real-world applications.

Introduction

The financial sector requires efficient systems to manage customer data, transactions, and account information. Most banks rely on complex systems; however, our goal is to create a simple and accessible banking management system as a starting point for learning. The system allows bank personnel to create and manage customer accounts, record deposits and withdrawals, and view transaction histories. Built in C, this project demonstrates key concepts such as structured programming, file handling, and data organization while emphasizing security and simplicity.

Project Features

For Users:

1. **Account Creation:** Account is created by generating random numbers for the user, the user has to input his/her name and password.
2. **Login function:** After creating the account the user uses the given account number and password to enter the main functionality of the banking system.
3. **Deposit Functionality:** Allows users to deposit money into an account and updates the balance accordingly.
4. **Withdraw Money:** Users can withdraw money from an account with balance checks to prevent overdrafts.
5. **Balance Inquiry:** Displays the current balance of a specified account.
6. **Transaction:** Allows user to transact to another account. It enables the user to send money.
7. **Account details and Transaction History:** Stores a history of transactions, allowing users to track deposits and withdrawals for each account.
8. **File-Based Data Management:** Account data will be stored in text files, ensuring data persistence even after the program is closed.
9. **Logout.**

For Admin:

1. **User Information Checking Functionality:** Admin can check the user information by their account number.
2. **Update User Information:** Update the user name from the account.
3. **Delete User account:** Admin can also delete the account of a user.
4. **Transaction Report:** Admin can view the transaction report of various users.
5. **Logout.**

Obstacles

Developing the Money Management Solution using the C language presented several challenges that required careful consideration and innovative solutions. These obstacles spanned various aspects of the project, from initial design to implementation and testing.

1. File Handling Complexity:

- **Challenge:** Managing user data through file handling was complex, particularly ensuring data integrity and preventing data loss or corruption.
- **Solution:** Implementing robust file handling mechanisms to read and write user data securely. Extensive testing was conducted to ensure data consistency and reliability.

2. User Authentication and Security:

- **Challenge:** Ensuring secure authentication and protecting sensitive information such as passwords was critical.
- **Solution:** Developing a secure login system that hashed passwords before storing them, and employing basic encryption techniques to protect user data.

3. Error Handling and Validation:

- **Challenge:** Proper error handling and input validation were necessary to prevent invalid data from being processed, which could lead to system crashes or incorrect operations.
- **Solution:** Implementing comprehensive error handling routines and input validation checks to ensure only valid data was processed by the system.

4. Concurrency and Data Consistency:

- **Challenge:** Ensuring data consistency during concurrent operations, such as simultaneous deposits or withdrawals by multiple users, was challenging.
- **Solution:** Implementing file locking mechanisms to prevent simultaneous write operations and maintain data integrity.

5. User Interface Design:

- **Challenge:** Designing a user-friendly interface using a console-based application was limited in terms of graphical elements and ease of navigation.
- **Solution:** Creating clear and concise menu-driven interfaces with well-defined prompts and instructions to guide users through various banking operations.

Used Technology

Software and Application Platform:

- CodeBlocks

Programming Language:

- C, chosen for its efficiency, low-level data handling capabilities, and suitability for system-level programming.

Operating System : Windows**File Handling in C:**

- Essential for managing account data storage, used docx. files.

Hardware: Unfortunately, there is no hardware used in my project.

Limitations

Despite its utility, the system has certain limitations:

1. **Limited Security Features:** Since the system does not integrate encryption or user authentication, it lacks robust security measures needed in real banking software.
2. **Scalability:** Designed as a standalone program, it does not support networked or multi-user environments.
3. **Data Integrity and Redundancy:** The file-based approach lacks the robustness of a database, which may impact data integrity and redundancy.
4. **Transaction Management:** As a simple system, it does not support advanced banking operations such as inter-account transfers or loan management.

User Manual

Main Menu Interface:

```

                                Banking Management System

                                1.User
                                2.Admin

                                Enter your choice: 1_
```

8.1 For User :

1. User menu:

```

                                Banking Management System

                                1. Login
                                2. Create Account
                                3. Exit

                                Enter your choice:
```

1.2 Account Registration:

```
Banking Management System

1. Login
2. Create Account
3. Exit

Enter your choice: 2

Add record
Enter name: adad

Generated Account Number: 9500
Enter Password, max 8 characters: 1234

Account Created Successfully
```

1.1 Account login:

```
Banking Management System

1. Login
2. Create Account
3. Exit

Enter your choice: 1

Enter Account number: 9500

Enter Password :1234

Login successful! Welcome, adad.
```


1.1.1 Deposit Money:

```
Banking Management System

1. Deposit Money
2. Withdraw Money
3. Send Money
4. Check Balance
5. Account Details
6. Logout

Enter your choice: 1
Enter money to deposit : 10000

Diposit successfull.
```

1.1.2 Withdraw Money:

```
Banking Management System

1. Deposit Money
2. Withdraw Money
3. Send Money
4. Check Balance
5. Account Details
6. Logout

Enter your choice: 2

Withdraw money :

Enter money to withdraw : 699

Successfully Withdrawed money !
```

1.1.4 Check Balance:

```
Banking Management System

1. Deposit Money
2. Withdraw Money
3. Send Money
4. Check Balance
5. Account Details
6. Logout

Enter your choice: 4

Check Balance

adad,Your current Balance is : 9301.00
```

1.1.3 Send Money:

```
Banking Management System

1. Deposit Money
2. Withdraw Money
3. Send Money
4. Check Balance
5. Account Details
6. Logout

Enter your choice: 3

Send money
Enter Account number : 3
Enter money to send : 2099

Successfully Sent money...
```

1.1.5 Account Details:

```
Banking Management System

1. Deposit Money
2. Withdraw Money
3. Send Money
4. Check Balance
5. Account Details
6. Logout

Enter your choice: 5

Account Details :

Name          : adad
Account Number : 9500
Account Balance: 7202.00

Transaction Details:

DIPOSIT- 10000.00 at - 23:47:53 - 13/11/2024
WITHDRAW 699.00 at - 23:48:46 - 13/11/2024
WITHDRAW 2099.00 at - 23:54:17 - 13/11/2024

Press Enter to exit.
```

```
Banking Management System

1. Deposit Money
2. Withdraw Money
3. Send Money
4. Check Balance
5. Account Details
6. Logout

Enter your choice:
```

1.1.6 Logout (User menu):

```
Banking Management System

1. Deposit Money
2. Withdraw Money
3. Send Money
4. Check Balance
5. Account Details
6. Logout

Enter your choice: 6

Exiting...
```

```
Banking Management System

1. Login
2. Create Account
3. Exit

Enter your choice:
```

1.3 Exit User Menu:

```
Banking Management System

1. Login
2. Create Account
3. Exit

Enter your choice: 3

Exiting ....
```

8.2 For Admin:

2. Admin login:

```
Banking Management System

1.User
2.Admin

Enter your choice: 2

Enter Admin passsword: pass_
```

2.1 User Information Checking Functionality:

```
Banking Management System

Admin Menu

1. See User Information
2. Update User Information
3. Delete User account
4. Transaction Report
5. Logout

Enter your choice: 1

Enter account number : 9500_
```

```
Banking Management System

Account Details :

Name          : adad
Account Number : 9500
Account Balance: 7202.00

Transaction Details:

DIPOSIT- 10000.00 at - 23:47:53 - 13/11/2024
WITHDRAW 699.00 at - 23:48:46 - 13/11/2024
WITHDRAW 2099.00 at - 23:54:17 - 13/11/2024

Press Enter to exit.
```

2.2 Update User Information:

```
Banking Management System

Admin Menu

1. See User Information
2. Update User Information
3. Delete User account
4. Transaction Report
5. Logout

Enter your choice: 2

Enter the account number of the user whose info you want to change: 9500

Enter account holder's correct name : md.asad

Name changed successfully.
```

```
Banking Management System

Account Details :

Name      : md.asad
Account Number : 9500
Account Balance: 7202.00

Transaction Details:

DIPOSIT- 10000.00 at - 23:47:53 - 13/11/2024
WITHDRAW 699.00 at - 23:48:46 - 13/11/2024
WITHDRAW 2099.00 at - 23:54:17 - 13/11/2024

Press Enter to exit.
```

2.3 Delete User account:

```
Banking Management System

Admin Menu

1. See User Information
2. Update User Information
3. Delete User account
4. Transaction Report
5. Logout

Enter your choice: 3

Enter User Account number : 9500

Successfully Deleted Account!
■
```

```
Banking Management System

Admin Menu

1. See User Information
2. Update User Information
3. Delete User account
4. Transaction Report
5. Logout

Enter your choice: 1

Enter account number : 9500

Account Doesnot Exist....

Press Enter to exit.■
```

2.4 Transaction Report:

Banking Management System

Admin Menu

1. See User Information
2. Update User Information
3. Delete User account
4. Transaction Report
5. Logout

Enter your choice: 4

Banking Management System

Transaction report :

Name	Ac.No	Trans.Type	Money	Time
komol	1	DIPOSIT-	100.00	- 10:19:38 - 27/10/2024
Karim	2	RECEIVE	1234.00	- 10:19:51 - 27/10/2024
Karim	2	RECEIVE	12345.00	- 10:23:13 - 27/10/2024
komol	1	WITHDRAW	100.00	- 10:24:41 - 27/10/2024
Karim	2	RECEIVE	100.00	- 10:24:41 - 27/10/2024
Karim	2	WITHDRAW	555.00	- 10:40:03 - 27/10/2024
karan	3	RECEIVE	555.00	- 10:40:03 - 27/10/2024
Karim	2	RECEIVE	200.00	- 10:44:49 - 27/10/2024
komol	1	DIPOSIT-	800.00	- 12:09:23 - 30/10/2024
komol	1	DIPOSIT-	500.00	- 13:07:31 - 30/10/2024
komol	1	WITHDRAW	500.00	- 13:09:15 - 30/10/2024
karan	3	DIPOSIT-	500.00	- 13:09:15 - 30/10/2024
komol	1	WITHDRAW	100.00	- 13:16:21 - 30/10/2024
karan	3	DIPOSIT-	100.00	- 13:16:21 - 30/10/2024
tomal	1	WITHDRAW	500.00	- 13:18:32 - 02/11/2024
karan	3	DIPOSIT-	500.00	- 13:18:32 - 02/11/2024
tomal	1	DIPOSIT-	10000.00	- 00:35:54 - 04/11/2024
tomal	1	WITHDRAW	5000.00	- 00:36:16 - 04/11/2024
tomal	1	WITHDRAW	2000.00	- 00:37:43 - 04/11/2024
Karim	2	DIPOSIT-	2000.00	- 00:37:43 - 04/11/2024
Rimon	6	DIPOSIT-	500.00	- 13:42:24 - 10/11/2024
Rimon	6	WITHDRAW	299.00	- 13:46:21 - 10/11/2024
rahim	4	DIPOSIT-	299.00	- 13:46:21 - 10/11/2024
www	2	DIPOSIT-	400.00	- 13:48:35 - 10/11/2024
www	2	WITHDRAW	199.01	- 13:48:53 - 10/11/2024
rahim	4	DIPOSIT-	199.01	- 13:48:53 - 10/11/2024
adad	9500	DIPOSIT-	10000.00	- 23:47:53 - 13/11/2024
adad	9500	WITHDRAW	699.00	- 23:48:46 - 13/11/2024
adad	9500	WITHDRAW	2099.00	- 23:54:17 - 13/11/2024
rahim	3	DIPOSIT-	2099.00	- 23:54:17 - 13/11/2024

Enter to exit.

2.5 Logout:

```
Banking Management System

Admin Menu

1. See User Information
2. Update User Information
3. Delete User account
4. Transaction Report
5. Logout

Enter your choice: 5

Exiting ...
```

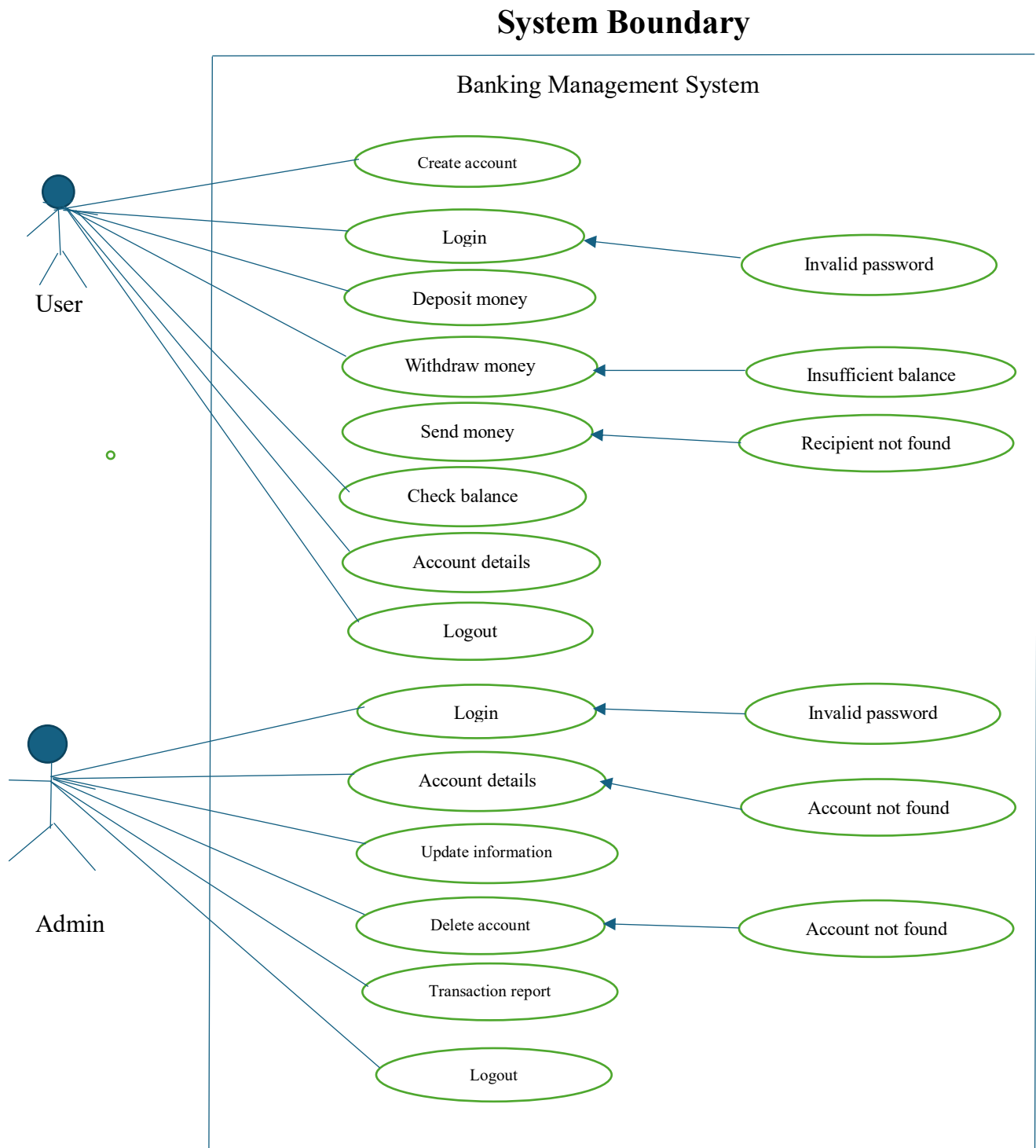
Return to main interface:

```
Banking Management System

1.User
2.Admin

Enter your choice: █
```

Use Case Diagram



Conclusion

The Banking Management System project provides a functional model for managing simple banking operations and serves as an excellent introduction to systems programming in C. Although it lacks the complexity and security of real-world banking software, this system effectively illustrates the power of the C programming language in handling structured data and persistent storage. This project is valuable for students and enthusiasts looking to deepen their understanding of C programming, data structures, and file handling.