



**FINAL PROJECT
SEMESTER 1st**

BANK MANAGEMENT SYSTEM

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Final Project

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CCP203 – FINAL PROJECT

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ABSTRACT

The Bank Management System is a software solution designed to address the challenges faced by banks in efficiently managing their operations while ensuring data security. The system offers features such as customer account management and transaction tracking. By replacing manual paperwork with digital records, the software streamlines the entire banking process, reducing the chances of errors and improving overall efficiency. Moreover, it provides an additional layer of security through login verification, ensuring authorized access to sensitive banking information. The Bank Management System employs file-based data storage, eliminating the need for complex database management systems. This design choice simplifies the installation and maintenance process while maintaining data integrity and reliability. By embracing technology and automating core banking processes, the Bank Management System offers a reliable and efficient solution to modernize the banking industry. This project contributes to the digital transformation of banking operations, leading to enhanced productivity, streamlined workflows, and improved data security.

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1. INTRODUCTION

The Bank Management System project aims to revolutionize the traditional manual methods used in banks by implementing an efficient and secure software solution developed in the C programming language. This project leverages the capabilities of C to create a comprehensive system that addresses the needs of both bank administrators and customers.

Similar to the Other Management System, which streamlines book management in libraries, the Bank Management System provides a digital platform for storing and managing crucial banking information. By digitizing data storage and eliminating the reliance on handwritten documents, this system significantly improves the efficiency and accuracy of banking operations. The Bank Management System consists of two primary modules: the Admin/Staff module and the User module. The Admin/Staff module serves as the backbone of the system, enabling administrators to oversee and manage the overall banking processes. On the other hand, the User module empowers customers to access and utilize various banking services offered by the system.

To ensure the security and integrity of the data, the system incorporates a login functionality, preventing unauthorized access and manipulation of sensitive information. This feature safeguards the confidentiality and reliability of the stored banking data. With the implementation of this Bank Management System, the administration can easily and efficiently manage book details, including customer accounts and transactions. Customers can also benefit from the system by accessing their accounts and viewing available banking services.

Overall, the Bank Management System represents a significant step towards digital transformation in the banking sector. It aims to optimize operations, enhance customer satisfaction, and improve data security. Through the utilization of C programming, this project provides a reliable and efficient solution for modernizing bank management processes.

2. MOTIVATION

The primary motivation behind selecting the Bank Management System project stems from the existing situation in the banking industry. Recognizing the challenges faced by banks in Nepal, it became evident that there is a lack of efficient bank management systems, particularly for smaller banks. Manual paperwork remains the predominant method for carrying out various tasks, leading to an increased risk of errors and raising significant concerns.

With numerous small banks across the country encountering similar issues, the absence of a systematic and organized management system has emerged as a critical problem that needs immediate attention. To address this pressing issue, the decision was made to develop a Bank Management System software solution.

The proposed software aims to revolutionize the way banks operate by introducing a comprehensive database for storing and managing crucial banking information. By automating data storage and entry processes, the system ensures enhanced accuracy and efficiency in managing bank operations. The user-friendly interface, equipped with clear labels for all essential features, ensures ease of use for bank administrators and customers alike.

The motivation behind this project also stems from the realization that local bank owners in Nepal still heavily rely on outdated methods, such as handwritten documents, to track their banking activities. This approach is not only inconvenient and time-consuming but also poses security risks. Therefore, there is a pressing need to overcome these challenges and improve the effectiveness and security of bank record-keeping.

By developing this Bank Management System software, the project aims to streamline banking operations, making them easier, faster, more efficient, and more secure. The software provides a digital solution that replaces the inefficient and insecure process of storing banking records at the local level.

Overall, the motivation behind this project lies in addressing the current limitations and challenges faced by banks in Nepal. By leveraging C programming, the Bank Management System aims to bring about a transformative change in the way banking operations are carried out, leading to increased efficiency, accuracy, and security.

3. OBJECTIVE

The objective of this C programming project on Bank Management System is to design and develop software that enhances the efficiency of user and administrative processes, reduces dependency on paper-based methods, and ultimately improves customer conversion rates while addressing security concerns. The project aims to achieve the following key objectives:

- **Enhance Organizational Management**

Develop a comprehensive software solution that facilitates seamless management of various banking operations, including customer accounts, transactions, to enhance overall organizational efficiency and effectiveness.

- **Reduce Paper Usage**

Implement digital record-keeping mechanisms to minimize reliance on traditional paper-based processes, thereby reducing costs, improving data accuracy, and promoting eco-friendly practices within the banking environment.

- **Optimize Time and Manpower Utilization**

Automate manual tasks, such as data entry and report generation, to streamline operations and reduce the time and effort required by bank staff, thereby optimizing resource allocation and improving productivity.

By achieving these objectives, this project aims to revolutionize bank management processes, resulting in enhanced operational efficiency, improved customer satisfaction, reduced costs, and heightened data security.

4. FEATURE OF PROJECT

This project offers the following features:

- It uses C programming language for its completion.
- It has Admin and User section.
- It can create and stores record of customer details in a file.
- It is banking system so; user can transfer an amount of balance to another person using account number and vice-versa.
- It has Admin and User login option for security measures.
- It also provides ATM system for User in which user can deposit and withdraw money.
- It overcomes the traditional method for keeping the record and It is fast, easy and effective

5. LITERATURE REVIEW

Banking institutions are the backbone of economic systems, and effective management is critical to their success. With advancements in technology and evolving customer expectations, the implementation of robust bank management systems has become imperative. This literature review explores key themes related to bank management systems, including efficiency, security, customer experience, and regulatory compliance.

Efficiency is a key consideration in bank management systems. Researchers have highlighted the importance of automating routine tasks, streamlined processes, and optimized resource allocation. Studies have shown that implementing efficient bank management systems leads to improved operational effectiveness, reduced costs, and enhanced customer satisfaction. This efficiency can be achieved through features such as automated transaction tracking, streamlined loan management, and accurate report generation.

Security is another crucial aspect of bank management systems. With the increasing risk of cyber threats and fraudulent activities, ensuring robust security measures is paramount. Research emphasizes the importance of implementing secure login verification, encryption techniques, and data backup systems to safeguard sensitive customer information and maintain the integrity of the system.

Customer experience is a key driver of success in the banking industry. Studies highlight the significance of user-friendly interfaces, clear navigation, and personalized services in enhancing customer satisfaction and loyalty. Bank management systems should prioritize providing a seamless and intuitive experience for customers, enabling them to easily access their accounts, make transactions, and retrieve relevant information.

Regulatory compliance is a critical concern in the banking sector. Researchers emphasize the need for bank management systems to adhere to various regulations, such as anti-money laundering (AML) and know-your-customer (KYC) requirements. Effective bank management systems should incorporate functionalities that facilitate compliance monitoring, reporting, and auditing processes to ensure adherence to regulatory standards.

In conclusion, the literature highlights the importance of efficient, secure, customer-centric, and compliant bank management systems.

6. PROBLEM STATEMENT

The existing bank management system relies heavily on manual paperwork, resulting in laborious efforts and a higher probability of errors. The need for extensive physical file storage complicates the maintenance of data related to various banking operations. The limitations of the traditional system have been identified, including the excessive use of manual labor, repetitive procedures, inadequate security measures, difficulties in handling data, lack of efficient data backup mechanisms, and challenges in managing and organizing information.

The traditional system also exhibits low levels of security, leaving sensitive customer information vulnerable to unauthorized access and potential breaches. In addition, the difficulties in handling and organizing data in a paper-based environment hinder quick and efficient retrieval of information, impacting customer service and decision-making processes

Furthermore, the lack of effective data backup mechanisms increases the risk of data loss in case of unforeseen events such as natural disasters or system failures. The current information management practices within the bank management system are challenging and chaotic, impeding the seamless flow of information and hindering effective decision-making.

Therefore, the need arises for a comprehensive Bank Management System software solution that addresses these challenges and provides a more efficient, secure, and streamlined approach to managing banking operations. By developing a software system that automates processes, improves security measures, ensures reliable data backup, and facilitates efficient information management, these identified issues can be effectively resolved, resulting in enhanced operational efficiency, improved customer satisfaction, and better overall management of banking processes.

7. ALGORITHM

The algorithm of the entire system is given below:

Steps	Work
✓ Step 1	Start
✓ Step 2	Input username and password
✓ Step 3	Check if username and password is belonging to admin or customers.
✓ Step 4	If it is belonging to customers then, move to main menu. Else, back to login page.
✓ Step 5	If it is belonging to admin then, move to main menu. Else, back to login page.
✓ Step 5	Press the options as you required.
✓ Step 6	Display the desire output as the user presses the option accordingly.
✓ Step 7	Exit

Figure 1: Algorithm of program

8. Flowchart

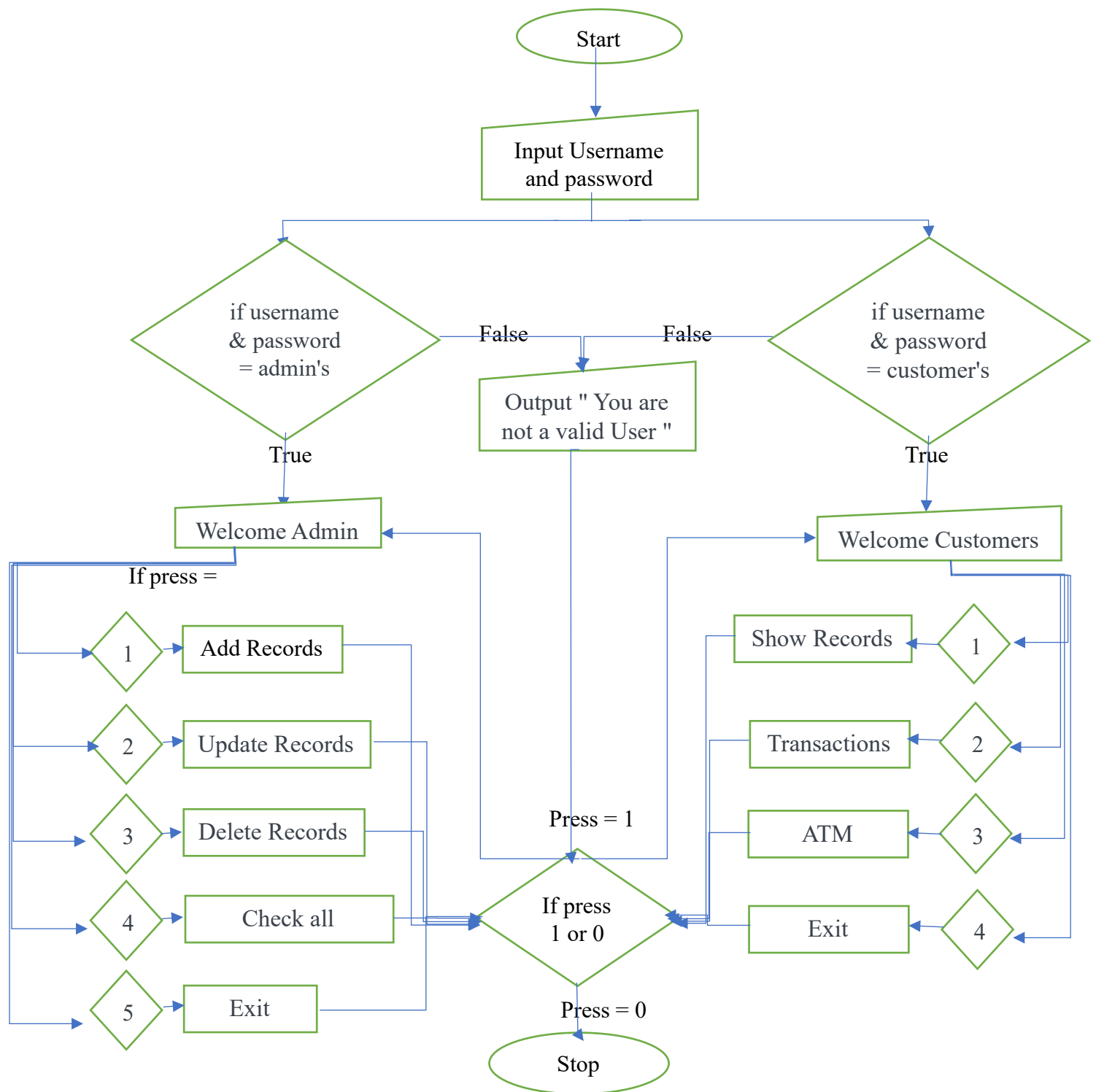


Figure 2: Flowchart of Library Management System

9. IMPLEMENTATION

We execute our program with the help of string and i/o libraries. To implement the goals, following methodology are used:

1. In start of this system with login authentication is done with string and file handling functions.
2. Use of structure while writing code.
3. It uses the concept of file handling for storing, reading and writing data in file.

10. FUTURE ENHANCEMENTS

As the field of banking and financial services continues to evolve, the integration of emerging technologies becomes crucial to stay competitive and provide innovative solutions. One potential future enhancement for the Bank Management System project is the integration of blockchain technology.

- **Enhanced Security:**

Blockchain provides a high level of security by utilizing cryptographic algorithms and distributed consensus mechanisms. Transactions recorded on the blockchain are resistant to tampering, making it extremely difficult for malicious actors to alter or manipulate data. This ensures the integrity and trustworthiness of the banking system.

- **Improved Transparency:**

The transparent nature of blockchain allows all participants in the banking system, including customers, administrators, and regulators, to have real-time visibility into transactions. This promotes transparency and accountability, reducing the risk of fraudulent activities.

- **Streamlined Transactions:**

Blockchain enables faster and more efficient transaction processing. With the use of smart contracts, which are self-executing agreements written in code, various banking operations such as fund transfers, loan approvals, and account management can be automated and executed seamlessly, eliminating the need for manual intervention.

By incorporating blockchain technology into the Bank Management System, these enhancements can bring about a more secure, transparent, and efficient banking experience for customers while streamlining administrative processes. However, it is important to consider the technical complexities and potential challenges associated with implementing blockchain, including scalability, interoperability, and regulatory considerations. Thorough research, analysis, and collaboration with experts in blockchain technology would be required to ensure a successful integration in the future.

11. OUTPUT SCREEN

The output screen of some features are provided below:

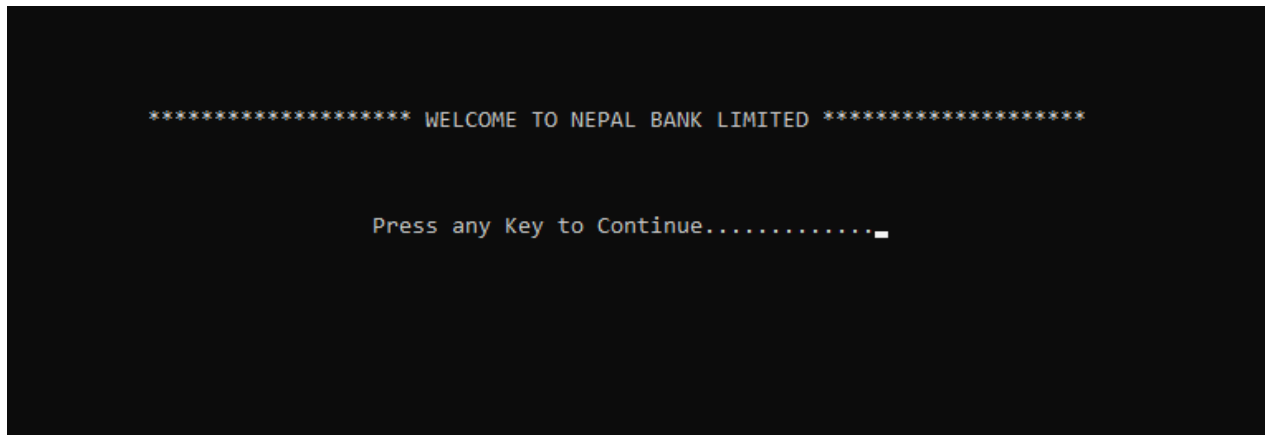


Figure 3: Welcome Screen

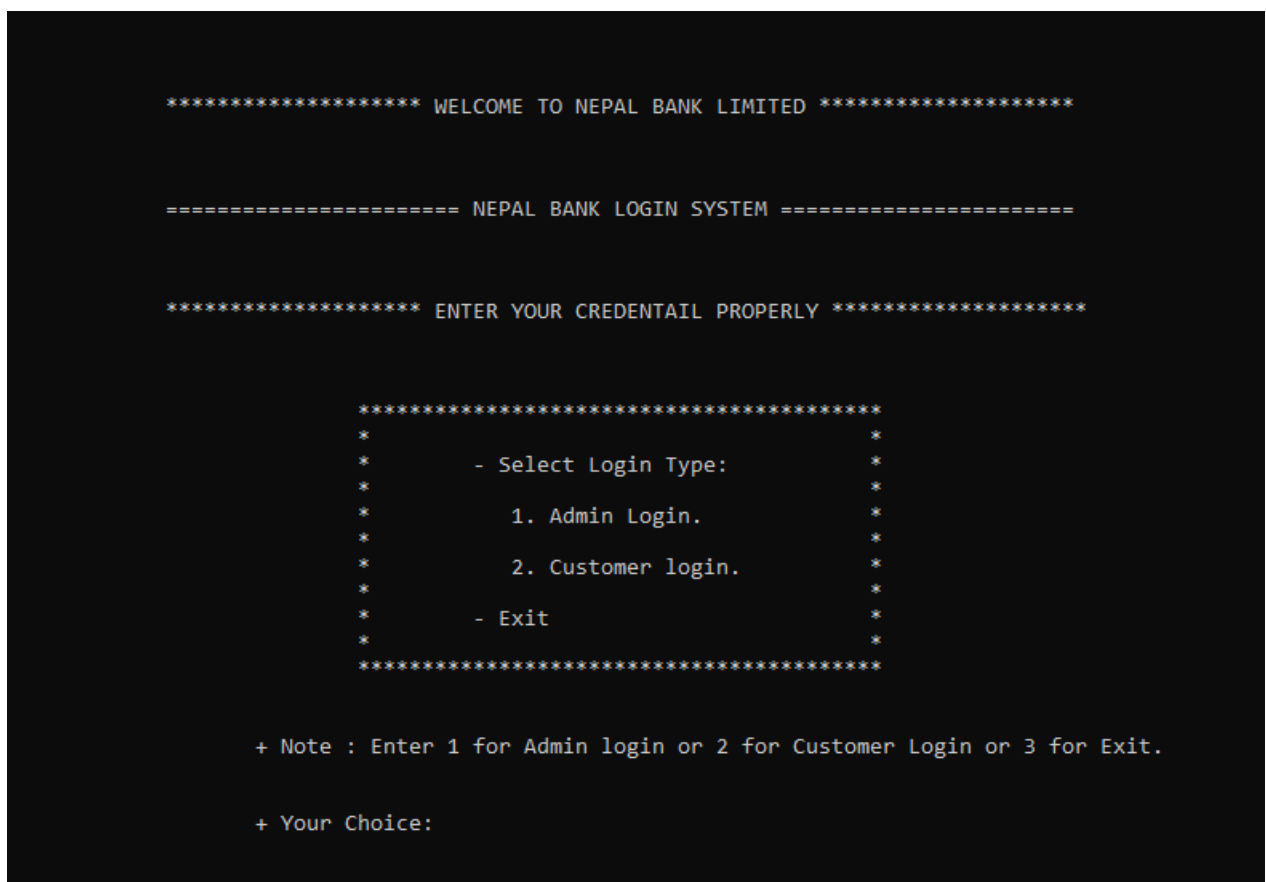


Figure 4: Login option

```
***** WELCOME TO NEPAL BANK LIMITED *****

***** Welcome Admin! *****

*****
*
*      ██ ** Main Menu **      *
*
*      1. Open Account.        *
*      2. Transaction on Account.*
*      3. Update Account.      *
*      4. Delete Account.      *
*      5. Check all Account.   *
*      6. Exit.                *
*
*****

+ Note : Enter 1, 2 , 3 , 4, 5 or 6 ( According to option )
+ Your Choice: 5_
```

Figure 5: Admin menu

```
*****
===== Display All Account's Information =====
x-----x-----x-----x-----x-----x-----x-----x-----x-----x
Account Name : Rohan Balami
Account Holder's father Name : Dal Bahadur Balami
Account Number : 1234
Date of Birth : 20/10/2022
Address : Pharping Ktm
Contact Number : 9874562010
Username : rohan
Current Account's Balance : 1100.00
x-----x-----x-----x-----x-----x-----x-----x-----x-----x
*****
```

Figure 6: Viewing all account information of customer.

```
*****
===== Create Account =====
Enter Account's Name : User2
Enter Account Holder's Father Name : Fthername
Enter Account's Number : 786245224
Enter Account Holder's Date of birth ( DD/MM/YY ) : 20/10/2002
Enter Account Holder's Address ( Street , Town, District, Country ) : Nepal
Enter Account Holder's Contact Number ( +977-XXXXXXXXXX ) : 9875651232
Enter Account Holder's Username: user2
Enter Account Holder's Password: user2
Enter Current Account Balance : $ 4000
Enter the Pin for ATM : 8529

*****

Account has been opened sucessfully

Press any Key to Continue....._
```

Figure 7: Creating or adding record of new customers.

```
*****
===== Account Transaction =====
Enter Account Number : 1234

Do you want to ?

    1. Deposit
    2. Withdraw

- Exit ( 3 )
+ Enter your choice:
```

Figure 8: Balance withdrawal and Deposit by Admin.

```
*****
===== Update Account Information =====

Enter Account Number : 1234

- Choose your option :

    1. Update Account Name.
    2. Update Account Holder's Father's Name.
    3. Update Date of Birth.
    4. Update Address.
    5. Update Contact No.
    6. Update Username.
    7. Update Pin
    8. Exit

Enter Your Option :
```

Figure 9: Updating the customers information by admin

```
*****
===== Delete Account Information =====

Enter Account Number : 1234

Are you sure to delete ?

    1. Yes
    2. Back

Enter Your Option :
```

Figure 10: Deleting Account Information

```
***** WELCOME TO NEPAL BANK LIMITED *****

===== NEPAL BANK LOGIN SYSTEM =====

***** ENTER YOUR CREDENTIAL PROPERLY *****

*****
*
* Enter your Username: ( Maximum 20 ) *
* => jf
* Enter your Password: ( Maximum 20 ) *
* => **
*****
```

Figure 11: Login panel for both admin and customers

```
***** WELCOME TO NEPAL BANK LIMITED *****

***** Welcome rohan *****

*****
*
*      ** Main Menu **
*
*      1. Check Your Own Details
*      2. Transaction on Account.
*      3. ATM feature
*      4. Exit.
*
*****

+ Note : Enter 1, 2 , 3 or 4 ( According to option )
+ Your Choice: 55_
```

Figure 12: Customer Menus

```
*****
===== Your Bank Details =====
X----X----X----X----X----X----X----X----X----X----X

Account Name : Rohan Balami
Account Holder's father Name : Dal Bahadur Balami
Account Number : 1234
Date of Birth : 20/10/2022
Address : Pharping Ktm
Contact Number : 9874562010
Username : rohan
Current Account's Balance : 2101.00

X----X----X----X----X----X----X----X----X----X----X

Enter any keys to continue.....
```

Figure 13: Checking Customers Detail by itself

```
+ Note : Enter 1, 2 , 3 or 4 ( According to option )
+ Your Choice: 2
+ Enter the account number: 4567
+ Enter the amount: $ 1000
Transaction Completed
```

Figure 14: Transferring balance from one to another

```
*****
===== Account Transaction =====

Do you want to ?

    1. Deposit
    2. Withdraw
- Exit ( 3 )
+ Enter your choice:
```

Figure 15: ATM Features

```
***** Thank you Admin ! See you Later ! *****

***** Press any Key to Exit..... *****
```

Figure 16: Exiting both as a customer and a staff

12. SOURCE CODE

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
#include<string.h>
#include<time.h>

#define MAX_USERNAME_LEN 20
#define MAX_PASSWORD_LEN 20

#define MAX_LEN 20

void auth();
int adminlogin();
int customerlogin();
void admin_function();
int customer_function(char* accountNum, char* cus_usr, char* atmpin);
void acc_open();
void trac_admin();
void update_acc();
void delete_acc();
void check_acc();
int cus_check_details(char* accountNum);
void cus_trans(char* accountNum);
int atm(char* accountNum, char* atmpin);

typedef struct Account
{
    char accountName[40];
    char acctholfathername[40];
    char accountNumber[20];
    char DateOfBirth[15];
    char address[50];
    char contactNum[15];
    char username[40];
    char upassword[40];
    float accountBalance;
    char atmPin[04];
} Account;

void main () {
    system("CLS");
```



```

printf("\t\t\t\t\t* Enter your Username: ( Maximum 20 ) \t*\n ");
printf("\t\t\t\t\t* => ");
scanf("%s", username);
printf("\t\t\t\t\t* Enter your Password: ( Maximum 20 ) \t*\n ");
printf("\t\t\t\t\t* => ");
int i=0;
char ch;
while ((ch = _getch()) != 13) {
    // ch = _getch(); // read a character from the user input

    if (ch == '\n') {
        password[i] = '\0';
        break;
    } else if (ch == '\b') { // backspace key
        if (i > 0) {
            i--;
            printf("\b \b"); // erase the last character on the screen
        }
    } else if ( ch != '\n' ) {
        password[i] = ch;
        i++;
        printf("*"); // display * on the screen to mask the password
    }
    password[i] = '\0';
}
printf("\t\t\t\t\t*\t\t\t\t\t*\n");
printf("\t\t\t\t\t*****\n\n\n");

// Define the valid usernames and passwords for the system
char valid_admin_username[20];
char valid_admin_password[20];

// file
FILE *admin_file;
char a_user[MAX_LEN], a_password[MAX_LEN];

char admin[] = "Admin/admin.txt";

// Admin Username and Password
admin_file = fopen(admin, "r");
if (admin_file == NULL) {
    printf("Unable to valid the User ! Please try again !");
    return 1;
}
fgets(a_user, MAX_LEN, admin_file);
strtok(a_user, "\n"); // remove newline character

```



```

getchar();
gets(accountInformation.accountName);
printf("\n\t\t\t\t\tEnter Account Holder's Father Name : ");
gets(accountInformation.acctholfathername);
printf("\n\t\t\t\t\tEnter Account's Number : ");
gets(accountInformation.accountNumber);
printf("\n\t\t\t\t\tEnter Account Holder's Date of birth ( DD/MM/YY ) : ");
gets(accountInformation.DateOfBirth);
printf("\n\t\t\t\t\tEnter Account Holder's Address ( Street , Town, District, Country ) : ");
gets(accountInformation.address);
printf("\n\t\t\t\t\tEnter Account Holder's Contact Number ( +977-XXXXXXXXXX ) : ");
gets(accountInformation.contactNum);
printf("\n\t\t\t\t\tEnter Account Holder's Username: ");
gets(accountInformation.username);
printf("\n\t\t\t\t\tEnter Account Holder's Password: ");
gets(accountInformation.upassword);
printf("\n\t\t\t\t\tEnter Current Account Balance : Rs ");
scanf("%f", &accountInformation.accountBalance);
getchar();
printf("\n\t\t\t\t\tEnter the Pin for ATM : ");
gets(accountInformation.atmPin);

printf("\n\n\t\t\t\t\t*****\n\n");
fwrite(&accountInformation, sizeof(accountInformation), 1, fileopen);

printf("\n\n\t\t\t\t\tAccount has been opened sucessfully\n");
printf("\n\n\t\t\t\t\tPress any Key to Continue.....");
getch();

fclose(fileopen);
}

// Function to handle admin Transaction
void trac_admin()
{
FILE *fileOne = fopen("Sys/accountInfo.bin", "rb");
FILE *temp = fopen("Sys/temp.bin", "wb");

Account accountInformation, temp_Info;

int op, flag = 0;

```



```

        printf("\t\t\t\t\tAccount Name : %s\n\n\t\t\t\t\tAccount Holder's father Name : %s\n\n\t\t\t\t\tAccount Number : %s\n\n\t\t\t\t\tDate of Birth : %s\n\n\t\t\t\t\tAddress : %s\n\n\t\t\t\t\tContact Number : %s\n\n\t\t\t\t\tUsername : %s\n\n\t\t\t\t\tCurrent Account's Balance : %.2f\n\n", accountInformation.accountName, accountInformation.acctHolfathernam, accountInformation.accountNumber, accountInformation.DateOfBirth, accountInformation.address, accountInformation.contactNum, accountInformation.username, accountInformation.accountBalance);
        printf("\t\t\t\t\ttx----x----x----x----x----x----x----x----x\n\n");
    }

    fclose(fileOne);
    printf("\n\n\t\t\t\t\tPress any key to Continue.....");
    getch();
}

// Function to handle customer login
int customer_function(char* accountNum, char* cus_usr, char* atmpin)
{
    // Customer Main Menu
    int choice_customer;
    lineno752:
    system("CLS");
    printf("\n\n\n\n\t\t\t\t\t ***** WELCOME TO NEPAL BANK LIMITED ***** \t\t\t\t\t\n\n");
    printf("\n\t\t\t\t\t ***** Welcome %s ***** \t\t\t\t\t\n\n", cus_usr);
    printf("\t\t\t\t\t *****\n\n");
    printf("\t\t\t\t\t*\t\t\t\t\t\n");
    printf("\t\t\t\t\t* \xB2\xB2\xB2 ** Main Menu ** \xB2\xB2\xB2 \t\t\t\t\t\n");
    printf("\t\t\t\t\t*\t\t\t\t\t\n");
    printf("\t\t\t\t\t* 1. Check Your Own Details \t\t\t\t\t\n");
    printf("\t\t\t\t\t*\t\t\t\t\t\n");
    printf("\t\t\t\t\t* 2. Transaction on Account.\t\t\t\t\t\n");
    printf("\t\t\t\t\t*\t\t\t\t\t\n");
    printf("\t\t\t\t\t* 3. ATM feature \t\t\t\t\t\n");
    printf("\t\t\t\t\t*\t\t\t\t\t\n");
    printf("\t\t\t\t\t* 4. Exit. \t\t\t\t\t\n");
    printf("\t\t\t\t\t*\t\t\t\t\t\n");
    printf("\t\t\t\t\t *****\n\n\n");
    printf("\t\t\t\t\t+ Note : Enter 1, 2 , 3 or 4 ( According to option ) \n\n");
    printf("\t\t\t\t\t+ Your Choice: ");
    scanf("%d", &choice_customer);

    // Call login function based on user's choice
    switch (choice_customer)
    {

```


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