DSA MINI PROJECT

UE22CS252A

3rd Semester, Academic Year 2023

BANK MANAGEMENT SYSTEM

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SYNOPSIS

Our program is for a basic banking system that allows users to perform various operations, including creating accounts, depositing money, checking account balances, transferring money between accounts, withdrawing money, and deleting accounts. Data structure used is Doubly Linked List

C Code Function Explanations

```
int acct_number()
```

Generates a random 6-digit account number.

```
acct* check(acct *head, int key)
```

Searches for an account with a given account number in the linked list.

```
void insert(acct** root, acct* temp)
```

Inserts a new account node into a binary search tree based on the account number.

```
acct* create_acct(acct* root)
```

Creates a new bank account by taking user input for account holder name and generates a unique account number. Inserts the account into the DLL

`void deposit(acct* root, int acct_num, float money)`

Deposits a specified amount into the account with the given account number.

`void check_balance(acct* root, int acct_num)`

Checks and prints the balance of the account with the given account number.

`void transfer(acct* root, int acct_num1, int acct_num2, float money)`

Transfers a specified amount from one account to another account.

`void withdraw(acct* root, int acct_num, float money)`

Withdraws a specified amount from the account with the given account number.

`void delete_account(acct* root, int acct_num)`

Deletes the account with the given account number from the DLL

`int main()`

The main function that provides a menu for users to interact with different banking operations, such as creating an account, depositing money, checking balance, transferring money, withdrawing money, deleting an account, and exiting the program.

This program simulates a basic banking system using a DLL to manage customer accounts and provides various banking operations for account management.

Code :

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

typedef struct ACCOUNT
{
    int account_number;
    char acct_holder_name[50];
    float balance;
    struct ACCOUNT* left;
    struct ACCOUNT* right;
} acct;
```

```
int acct_number()
{
    srand(time(NULL)); // Seed the random number generator only once at the
beginning
  int acctnum = rand() % 900000 + 100000;
    return acctnum;
}

acct* check(acct *head, int key)
{

  acct *current = head;
  while (current != NULL)
  {
    if (current->account_number == key)
    {
       return current;
    }
    else
    {
      current = current->right;
    }
  }

  return NULL;
}


void insert(acct** root, acct* temp)
{
    acct* new_acc = (acct*)malloc(sizeof(acct));
    new_acc->account_number = temp->account_number;
    strcpy(new_acc->acct_holder_name, temp->acct_holder_name);  // Copy the
account holder name
    new_acc->balance = temp->balance;
    new_acc->left = NULL;
    new_acc->right = NULL;

    if (*root == NULL)
    {
        *root = new_acc;
    }
    else
    {
        acct* cur = *root;
        while (cur != NULL)
        {
            if (temp->account_number < cur->account_number)
            {
                if (cur->left == NULL)
                {
                    cur->left = new_acc;
                    new_acc->right = cur;
```

```
                    break;
                }
                cur = cur->left;
            }
            else
            {
                if (cur->right == NULL)
                {
                    cur->right = new_acc;
                    new_acc->left = cur;
                    break;
                }
                cur = cur->right;
            }
        }
    }
}

acct* create_acct(acct* root)
{
    acct* temp = (acct*)malloc(sizeof(acct));
    if (temp == NULL)
    {
        printf("Please try to create the account again\n");
        return root;
    }

    temp->balance = 0.0;
    temp->left = NULL;
    temp->right = NULL;

    printf("Please Enter Your Name: ");
    scanf("%s", temp->acct_holder_name);
    for(int i=0;i<strlen(temp->acct_holder_name);i++)
    {
        if(!(isalpha(temp->acct_holder_name[i])))
            {
                printf("Please Enter a valid Name: ");
                scanf("%s",temp->acct_holder_name);
                i=0;
                continue;
            }
    }

    // Generate a unique account number
    temp->account_number = acct_number();

    // Use the corrected insert function to maintain order
    insert(&root, temp);

    printf("Thank you for creating an account in the bank.\n");
    printf("Name: %s\nAccount number: %d\nAccount has been created\n", temp-
>acct_holder_name, temp->account_number);
```

```
    return root;
}




void deposit(acct* root, int acct_num, float money)
{
    acct* cur = check(root, acct_num);
    if (cur != NULL)
    {
        cur->balance += money;
        printf("Successfully added %.2f amount in the account number %d\n", money,
acct_num);
    }
    else
    {
        printf("Could not find the bank account. Please try again later.\n");
    }
}

void check_balance(acct* root, int acct_num)
{
    acct* cur = check(root, acct_num);
    if (cur != NULL)
    {
        printf("Account holder name: %s\nAccount number: %d\nBalance: %.2f\n",
cur->acct_holder_name, cur->account_number, cur->balance);
    }
    else
    {
        printf("Could not find the account. Please try again.\n");
    }
}

void transfer(acct* root, int acct_num1, int acct_num2, float money)
{
    if (root == NULL)
    {
        printf("Could not find the account. Please try again later.\n");
        return;
    }

    if (acct_num1 == acct_num2)
    {
        printf("Self transfer\n");
        deposit(root, acct_num1, money);
        return;
    }

    acct* cur1 = check(root, acct_num1);
    acct* cur2 = check(root, acct_num2);

    if (cur1 == NULL || cur2 == NULL)
```

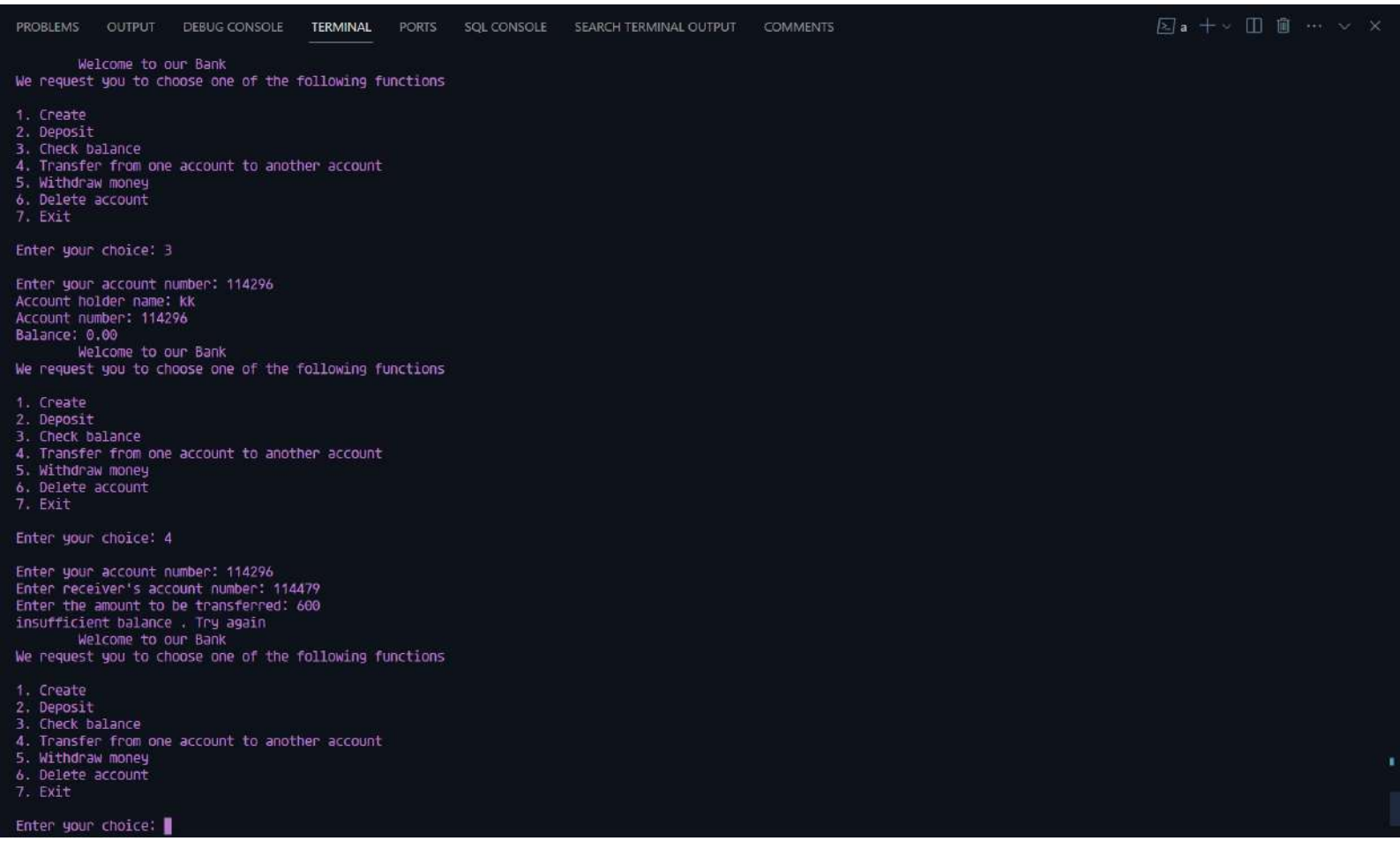
```
    {
        printf("Cannot make the transaction. Please enter the datails correctly
and try again.\n");
        return;
    }
    else
    {
        if(cur1->balance>=money)
        {
        cur1->balance -= money;
        cur2->balance += money;
         printf("Successfully transferred %.2f money from account number %d to
account number %d\n", money, acct_num1, acct_num2);
        }
        else{
            printf("insufficient balance . Try again\n");
        }

    }
}

void withdraw(acct* root, int acct_num, float money)
{
    acct* cur = check(root, acct_num);
    if (cur != NULL)
    {
        if (cur->balance >= money)
        {
            cur->balance -= money;
            printf("Successfully withdrew %.2f amount from the account number
%d\n", money, acct_num);
        }
        else
        {
            printf("Insufficient balance for withdrawal.\n");
        }
    }
    else
    {
        printf("Could not find the bank account. Please try again later.\n");
    }
}

void delete_account(acct* root, int acct_num)
{

  acct*node=check(root,acct_num);

  if(node!=NULL)
  {
  if (node->left == NULL) {
    root = node->right;
    if (root != NULL) {
      root->left = NULL;
```

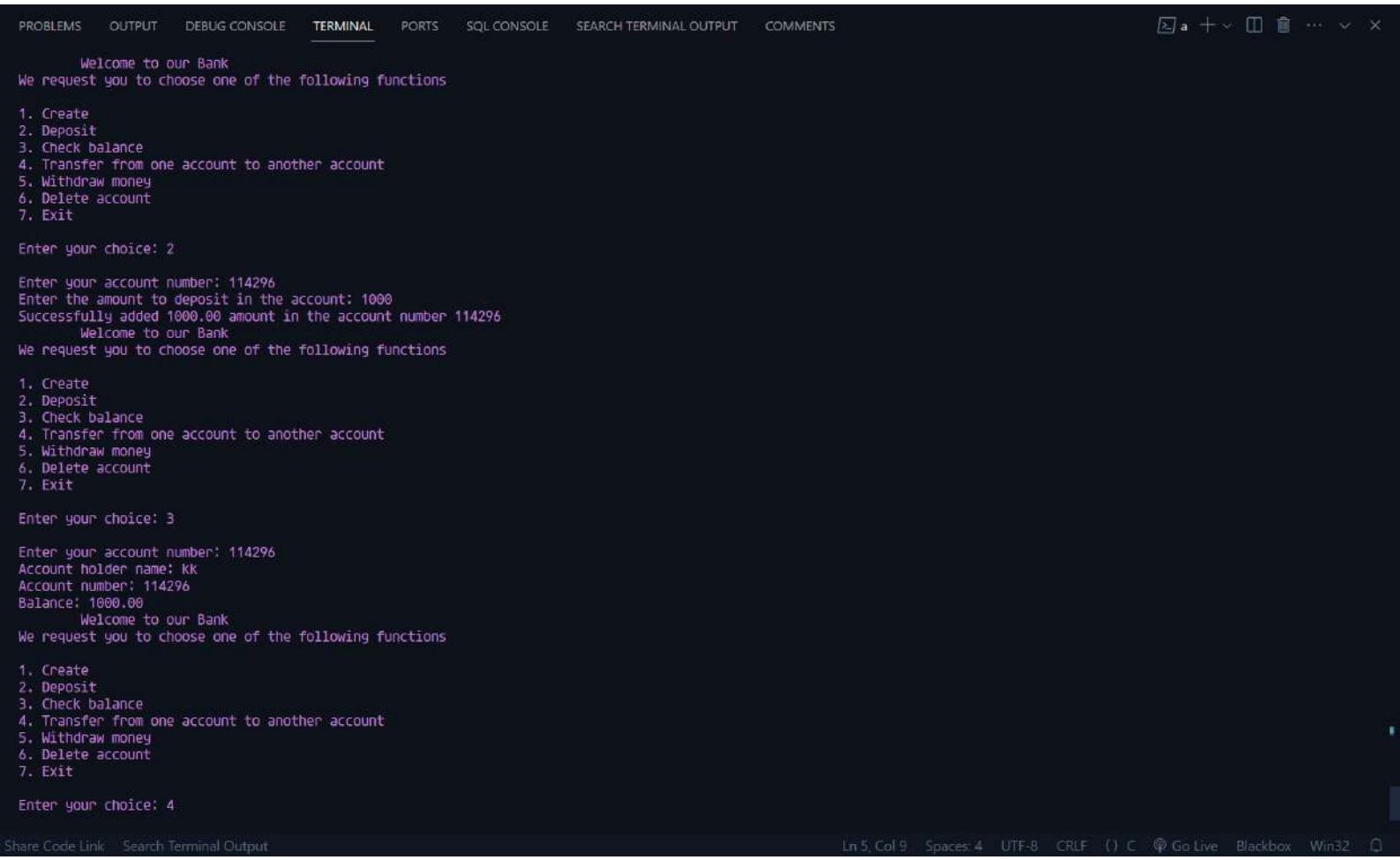
```
    }
  } else {

    node->left->right = node->right;
    if (node->right != NULL) {
      node->right->left = node->left;
    }
  }

  free(node);

        printf("Account number %d has been deleted.\n", acct_num);
    }
    else
    {
        printf("Could not find the account. Please try again.\n");
    }
}

int main()
{

    int user_acct_num = 0;
    int user_acct_num1 = 0, user_acct_num2 = 0;
    float amt = 0;
    acct* root = NULL;

    while (1)
    {
        int ch;
        printf("\tWelcome to our Bank\nWe request you to choose one of the
following functions\n");
        printf("1. Create\n2. Deposit\n3. Check balance\n4. Transfer from one
account to another account\n5. Withdraw money\n6. Delete account\n7. Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &ch);

        switch (ch)
        {
        case 1:
            root = create_acct(root);
            break;
        case 2:
            printf("Enter your account number: ");
            scanf("%d", &user_acct_num);
            printf("Enter the amount to deposit in the account: ");
            scanf("%f", &amt);
            deposit(root, user_acct_num, amt);
            break;
        case 3:
            printf("Enter your account number: ");
            scanf("%d", &user_acct_num);
            check_balance(root, user_acct_num);
            break;
```

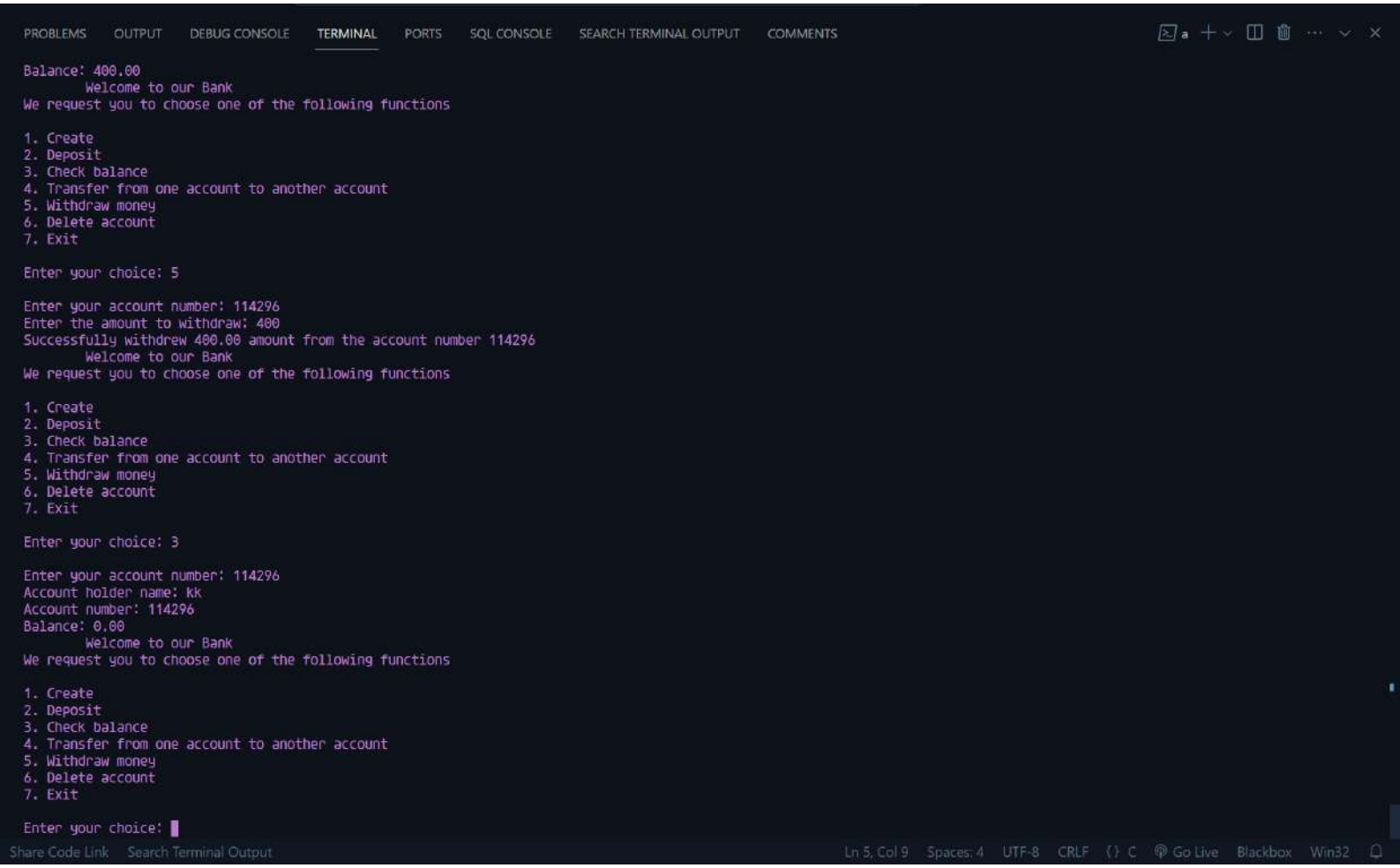
```
            case 4:
                printf("Enter your account number: ");
                scanf("%d", &user_acct_num1);
                printf("Enter receiver's account number: ");
                scanf("%d", &user_acct_num2);
                printf("Enter the amount to be transferred: ");
                scanf("%f", &amt);
                transfer(root, user_acct_num1, user_acct_num2, amt);
                break;
            case 5:
                printf("Enter your account number: ");
                scanf("%d", &user_acct_num);
                printf("Enter the amount to withdraw: ");
                scanf("%f", &amt);
                withdraw(root, user_acct_num, amt);
                break;
            case 6:
                printf("Enter your account number: ");
                scanf("%d", &user_acct_num);
                delete_account(root,user_acct_num);
                break;
            case 7:
                printf("Thank you for visiting our bank. Have a nice day.\n");
                exit(0);
            default:
                printf("Please try again.\n");
                continue;
            }
        }
        return 0;
    }
```

Output :


Pro696969@Pro696969
DSA proj
gcc .\main.c
Pro696969@Pro696969
DSA proj
./a
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 1
Please Enter Your Name: kk
Thank you for creating an account in the bank.
Name: kk
Account number: 114296
Account has been created
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 1
Please Enter Your Name: lohit
Thank you for creating an account in the bank.
Name: lohit
Account number: 114479
Account has been created


PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
SQL CONSOLE
SEARCH TERMINAL OUTPUT
COMMENTS
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 3
Enter your account number: 114296
Account holder name: kk
Account number: 114296
Balance: 0.00
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 4
Enter your account number: 114296
Enter receiver's account number: 114479
Enter the amount to be transferred: 600
insufficient balance . Try again
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice:

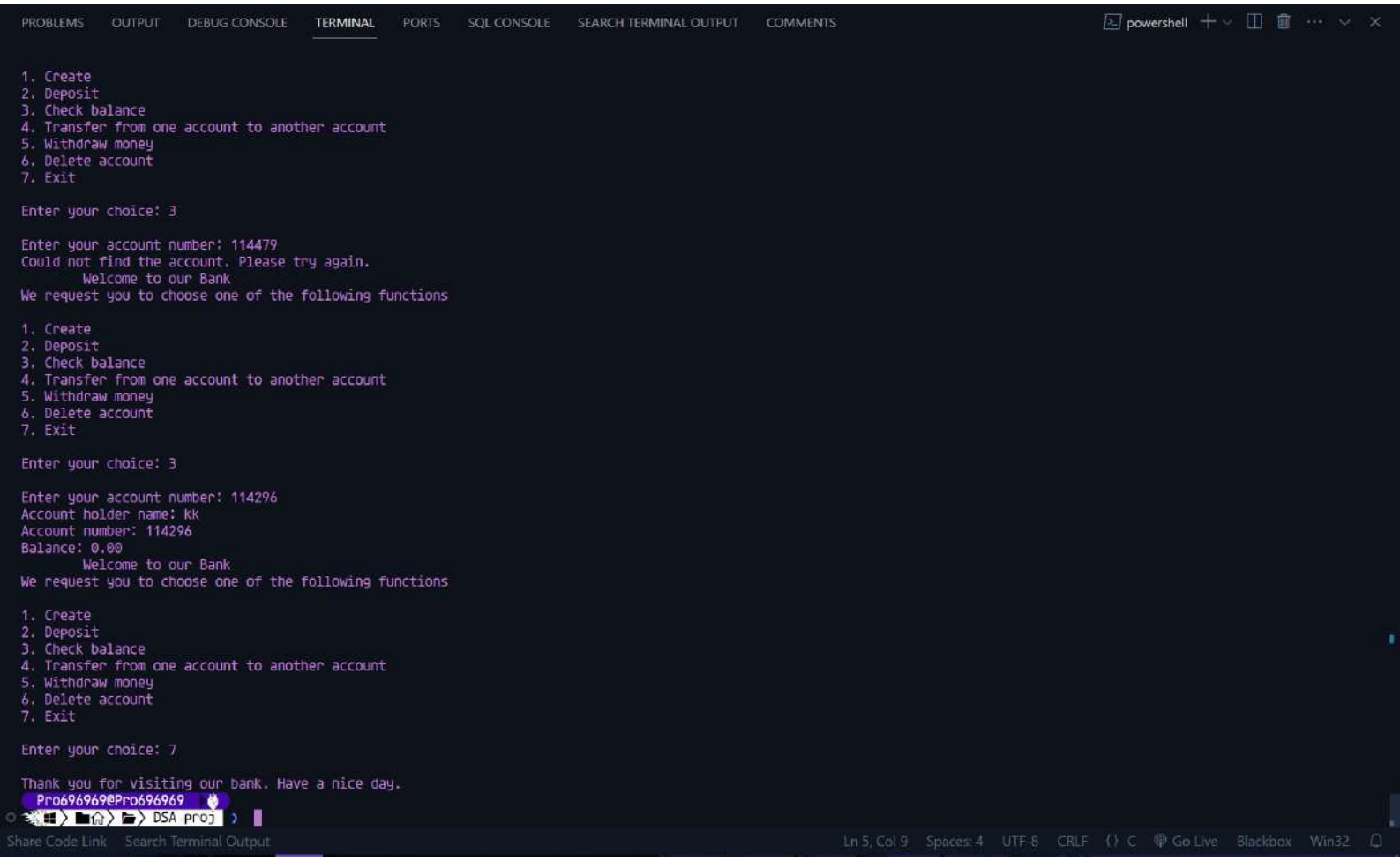

PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
SQL CONSOLE
SEARCH TERMINAL OUTPUT
COMMENTS
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 2
Enter your account number: 114296
Enter the amount to deposit in the account: 1000
Successfully added 1000.00 amount in the account number 114296
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 3
Enter your account number: 114296
Account holder name: kk
Account number: 114296
Balance: 1000.00
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 4
Share Code Link
Search Terminal Output
Ln 5, Col 9
Spaces: 4
UTF-8
CRLF
C
Go Live
Blackbox
Win32


PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SQL CONSOLE SEARCH TERMINAL OUTPUT COMMENTS
Balance: 400.00
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 5
Enter your account number: 114296
Enter the amount to withdraw: 400
Successfully withdrew 400.00 amount from the account number 114296
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 3
Enter your account number: 114296
Account holder name: kk
Account number: 114296
Balance: 0.00
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice:
Share Code Link Search Terminal Output
Ln 5, Col 9 Spaces: 4 UTF-8 CRLF C Go Live Blackbox Win32

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SQL CONSOLE SEARCH TERMINAL OUTPUT COMMENTS

```
Enter your choice: 6

Enter your account number: 114479
Account number 114479 has been deleted.
        Welcome to our Bank
We request you to choose one of the following functions

1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit

Enter your choice: 3

Enter your account number: 114479
Could not find the account. Please try again.
        Welcome to our Bank
We request you to choose one of the following functions

1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit

Enter your choice: 3

Enter your account number: 114296
Account holder name: kk
Account number: 114296
Balance: 0.00
        Welcome to our Bank
We request you to choose one of the following functions

1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
```

Share Code Link Search Terminal Output Ln 5, Col 9 Spaces: 4 UTF-8 CRLF { } C Go Live Blackbox Win32


PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SQL CONSOLE SEARCH TERMINAL OUTPUT COMMENTS
powershell
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 3
Enter your account number: 114479
Could not find the account. Please try again.
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 3
Enter your account number: 114296
Account holder name: kk
Account number: 114296
Balance: 0.00
Welcome to our Bank
We request you to choose one of the following functions
1. Create
2. Deposit
3. Check balance
4. Transfer from one account to another account
5. Withdraw money
6. Delete account
7. Exit
Enter your choice: 7
Thank you for visiting our bank. Have a nice day.
Pro696969@Pro696969
DSA proj
Share Code Link Search Terminal Output
Ln 5, Col 9 Spaces: 4 UTF-8 CRLF C Go Live Blackbox Win32