



CSE/ECE/ISE Department – Faculty of Engineering - MSA

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COM265 Computer Programming II

Assignment/Lab No

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Account.h

```
#pragma once
#include <string>
#include <vector>
#include "transaction.h"
#include <iostream>
using namespace std;
class Account
{
private:
    string CustomerName;
    int MobileNumber;
    double Balance;
    int AccountNumber;
    static int NumAcc;
    vector<transaction>Alltransactions;

public:
    Account() {}
    int getAccountNumber() {
        return AccountNumber;
    }
    void setCustomerName(string name) {
        this->CustomerName = name;
    }
    string getCustomerName() {
        return CustomerName;
    }
    void setMobileNumber(int M_N) {
        this->MobileNumber = M_N;
    }
}
```

Assignment No.

```

int getMobileNumber() {
    return MobileNumber;
}

void setBalance(double a) {
    this->Balance = a;
}

double getBalance() {
    return Balance;
}

vector<transaction> getTransactions(){
    return Alltransactions;
}

Account(string CustomerName, int MobileNumber, double Balance) {
    this->CustomerName = CustomerName;
    this->MobileNumber = MobileNumber;
    this->Balance = Balance;
    NumAcc++;
    AccountNumber = NumAcc;
}

void DepositAmount(double am) {
    Balance = Balance + am;
    transaction trans;
    trans.setAmount(am);
    trans.setTransactionType('D');
    trans.setAccountNumber(getAccountNumber());
    Alltransactions.push_back(trans);
}

void withdrawAmount(double am) {
    Balance = Balance - am;
    transaction trans;
    trans.setAmount(am);
    trans.setTransactionType('W');
    trans.setAccountNumber(getAccountNumber());
    Alltransactions.push_back(trans);
}

void DisplayAllTransactions() {
    for (auto i : Alltransactions) {
        i.Display();
        cout << "=====\n";
    }
}

void AccountDisplay(){
    cout << "Customer Account Number: " << CustomerName << endl;
    cout << "CustomerName: " << MobileNumber << endl;
    cout << "Customer Mobile Number: " << AccountNumber<< endl;
    cout << "Customer Balance: " << setprecision(15) << Balance<<endl;
}

```

```

        cout << "=====\n";
    }
};
int Account:: NumAcc = 10000;

```

Transaction.h

```

#pragma once
#include "Account.h"
#include <ctime>
#include <cstring>
#include <iostream>
#include <chrono>
using namespace std;

time_t t;

class transaction {
private:
    int TransactionId;
    static int num;
    char TransactionType;
    double amount;
    int AccountNumber;
    char date [90] ;
public:
    transaction() {
        num++;
        TransactionId = num;
        t = time(0);
        const char* format = "%Y-%m-%d %H:%M:%S";
        struct tm* timeinfo = localtime(&t);
        strftime(date, sizeof(date), format, timeinfo);
    }
    void setTransactionId(int t) {
        TransactionId = t;
    }
    int getTransactionId() {
        return TransactionId;
    }
    void setTransactionType(char type) {
        TransactionType = type;
    }

    char getTransactionType() {
        return TransactionType;
    }

    void setAmount(double amount) {
        this->amount = amount;
    }
}

```

```

double getAmount() {
    return amount;
}

void setAccountNumber(int accNum) {
    AccountNumber = accNum;
}

string getDate(){
    return date;
}
void Display() {
    cout << "Transaction ID: " << TransactionId << endl;
    cout << "Transaction Type: " << TransactionType << endl;
    cout << "Account Number: " << AccountNumber<< endl;
    cout << "Amount: " << amount << endl;
    cout << "Date: " << date << endl;
}

};
int transaction::num = 0;

```

Search.h

```

#include "Account.h"
#include <iostream>
#include <string>
#include <vector>

using namespace std;

class Search{
public:
    vector<Account>::iterator searchByAccountNum(int id, vector<Account>&
Accounts){
        vector<Account>::iterator it;
        bool found = false;
        it = Accounts.begin();
        for (auto account : Accounts) {
            if (account.getAccountNumber() == id) {
                found = true;
                break;
            }
            it++;
        }
        if (!found) {
            cout << "Account is not found" << endl;
        }
        else{
            return it;
        }
    }
};

```

```

    }
}
void searchByDate(char x [90], vector<Account>::iterator y){
    bool found = false;
    for (auto transaction : y->getTransactions()){
        if(transaction.getDate().find(x) != -1){
            transaction.Display();
            found = true;
            break;
        }
    }
    if (!found){
        cout<<"There is no transaction that occurred in that date."<<endl;
    }
}
};

```

Loan.h

```

#pragma once
#include<string>
#include <iostream>
class Loan
{
public:
    int loanId;
    int accountNumber;
    double loanAmount;
    string loanType;
    int interestRate;
    int installmentAmount;

    Loan(int Iid, int accNumber, double amount, string type, double rate){
        loanId=Iid;
        accountNumber=accNumber;
        loanAmount=amount;
        loanType=type;
        interestRate=rate;
        installmentAmount=calculateInstallment();
    }
    double calculateInstallment(){
        double totalAmount=loanAmount+(loanAmount*interestRate/100);
        return totalAmount/12;
    }
    void payInstallment(){
        if(loanAmount>0){
            loanAmount-=installmentAmount;
        }
    }
};

```

```

        cout<<"installement is successfully paid/Remaining Loan
amount$"<<fixed<<setprecision(2)<<loanAmount<<endl;
    }
    else{
        cout<<"loan not paid"<<endl;
    }

}

void displayLoanInfo(){
    cout <<"Loan Id:" <<loanId <<endl;
    cout<<"Account Number:"<<accountNumber<<endl;
    cout<<"Loan Amount:"<<fixed <<setprecision(2)<<loanAmount<<endl;
    cout<<"Loan Type:"<<loanType<<endl;
    cout<<"intrest Rate:"<<fixed<<setprecision(2)<<intrestRate<<"%"<<endl;
    cout<<"monthly Installment
Amount:"<<fixed<<setprecision(2)<<installmentAmount<<endl;
}

};

```

Validations.h

```

class Validation{
public:
    bool validateName(string name){
        for(char c:name){
            if(!isalpha(c) && c!=' '){
                return false;
            }
        }
        return true;
    }

    bool validateMobileNumber(string mobileNumber){
        if(mobileNumber.length()!=10){
            return false;
        }
        for(char c:mobileNumber){
            if(!isdigit(c)){
                return false;
            }
        }
        return true;
    }

    bool validateNumericInput(string input){
        for(char c:input){
            if(!isdigit(c)&&c!='.'){
                return false;
            }
        }
        return true;
    }
}

```

```

    bool validateChoice(int choice,int min,int max){
        return choice>=min&&choice<=max;
    }

};

```

Main.cpp

```

#include <iostream>
#include <iomanip>
#include <stdlib.h>
#include "Account.h"
#include <string>
#include <vector>
#include <limits>
#include "transaction.h"
#include "Loan.h"
#include "Search.h"
#include "Transfer.h"
#include "Validation.h"
#include <chrono>

using namespace std;
class Menu {
public:
    void mainmenu() {
        cin.ignore();
        cout << "\t=====+\n";
        cout << "\t|                Menu                |\n";
        cout << "\t=====+\n";
        cout << "\t 1-    Open Account \n\t 2-    Deposit Account \n\t
3-    withdraw Amount \n\t ";
        cout << "4-    Display ALL Account \n\t 5-    Display Transaction \n\t
6-    Delete Account \n\t";
        cout << " 7-    Loan \n\t 8-    Search \n\t 9-    Transfer Amount
\n\t";
        cout << " 10-    Exit \n\t";

    }
    Menu() {

    }
};

int main()
{
    cout << setw(6) << left << "*"
    " ***** " << " ***** " << " *
    " ***** " << " ***** " << " *
    " ***** " << " ***** " << endl;

```

```
cout << setw(6) << left << "*" * " << " * " << " * " <<  
" * " << " * " << " * " << " * " << " * " << endl;  
cout << setw(6) << left << "*" * " << " * " << " * " << " * " <<  
" * " << " * " << " * " << " * " << " * " << endl;  
cout << setw(6) << left << "*" * " << " * " << " * " << " * " <<  
" * " << " * " << " * " << " * " << " * " << endl;  
cout << setw(6) << left << "*" * " << " * " << " * " << " * " <<  
" * " << " * " << " * " << " * " << " * " << endl;  
cout << setw(6) << left << "*" * " << " * " << " * " << " * " <<  
" * " << " * " << " * " << " * " << " * " << endl;  
  
Menu MENU1;  
vector<Account>Accounts;  
vector<Account>::iterator it;  
int mainAccNum;  
int menu;  
bool t = true;  
  
while (t) {  
    MENU1.mainmenu();  
    cin >> menu;  
    system("cls");  
    switch (menu) {  
        case (1): {  
            cout << "Enter Your Account Number or Type (0) to create a new  
Account: ";  
            cin >> mainAccNum;  
            if (mainAccNum == 0){  
                string name;  
                int mob;  
                double balance;  
                cout << "Enter your Name: ";  
                cin.ignore();  
                getline(cin, name);  
                cout << "Enter your mobile number: ";  
                cin >> mob;  
                cout << "Enter your Balance: ";  
                cin >> balance;  
                Account account(name, mob, balance);  
                Accounts.push_back(account);  
                system("cls");  
            }  
            else {  
                Search search;  
                it = search.searchByAccountNum(mainAccNum, Accounts);  
            }  
  
            break;  
        }  
    }
```



```

        case (2): {
            double amount;
            cout << "Enter Amount to Deposite: ";
            cin >> amount;
            it->DepositeAmount(amount);
            break;
        }

        case 3:
            double amount;
            cout << "Enter Amount to Withdraw: ";
            cin >> amount;
            it->withdrawAmount(amount);
            break;

        case (4): {
            for (auto acc : Accounts) {
                acc.AccountDisplay();
            }
            cout << "Type ok to continue: ";
            string dummy;
            cin >> dummy;
            system("cls");
            break;
        }

        case (5): {
            it->DisplayAllTransactions();
            cout << "Type ok to continue: ";
            string dummy;

            cin >> dummy;
            system("cls");
            break;
        }
        case (6):{
            break;
        case (7):{
            int loanId, accountNumber;
            double loanAmount, interestRate;
            string loanType;

            cout << "Enter Loan ID: ";
            cin >> loanId;

            cout << "Enter Account Number: ";
            cin >> accountNumber;

```

```

        cout << "Enter Loan Amount: $";
        cin >> loanAmount;

        cout << "Enter Loan Type: ";
        cin.ignore();
        getline(cin, loanType);

        cout << "Enter Interest Rate (%): ";
        cin >> interestRate;

        Loan userLoan(loanId, accountNumber, loanAmount, loanType, interestRate);

        userLoan.displayLoanInfo();

        userLoan.payInstallment();
    }

    break;
case (8):{
    cout<<"Type 1 to search for an Account"<<endl;
    cout<<"Type 2 to search for a transaction"<<endl;
    int option;
    cin>>option;
    system("cls");
    Search search;
    if (option == 1){
        cout<<"Type 1 to search by Account number"<<endl;
        cout<<"Type 2 to search by Account amount range"<<endl;
        int option2;
        cin>>option2;
        system("cls");
        switch (option2){
            case(1):{
                cout << "Enter Your Account Number: ";
                int AccNum;
                cin>>AccNum;
                vector<Account>::iterator x;
                x = search.searchByAccountNum(AccNum, Accounts);
                x->AccountDisplay();
                break;
            }
            case(2):{

                break;
            }
        }
    }
}
}

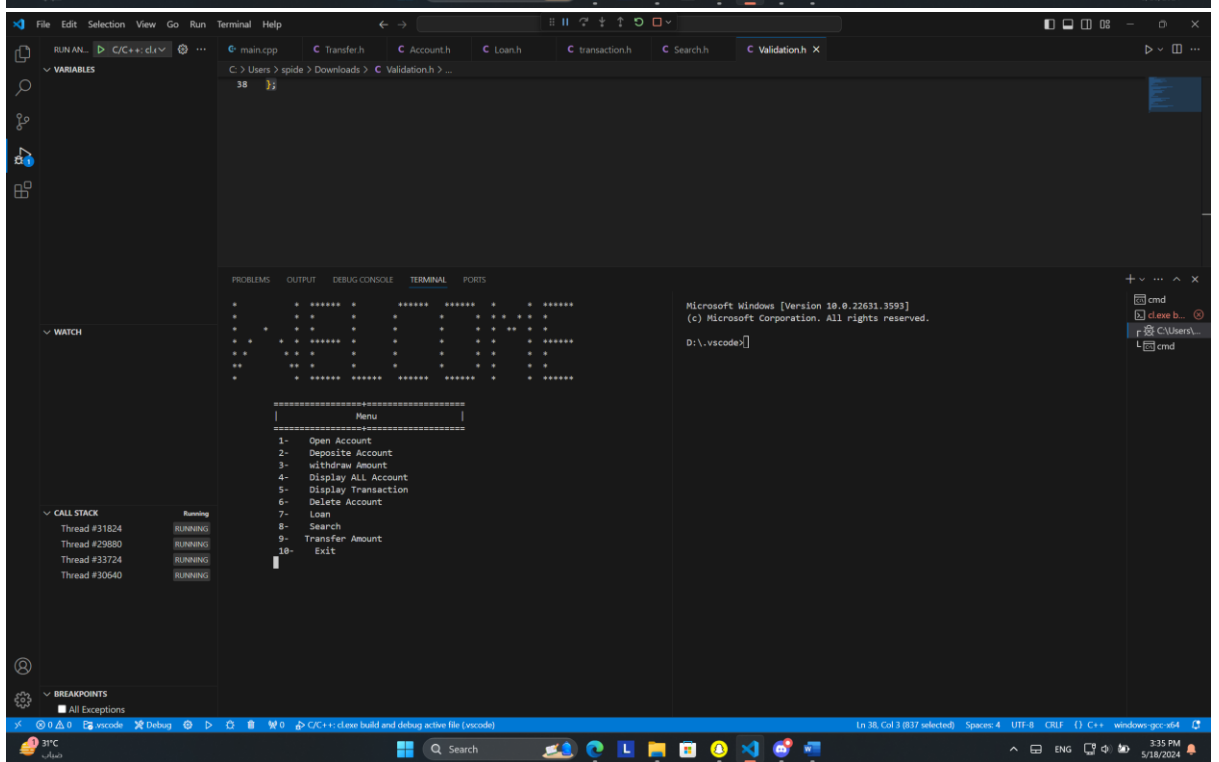
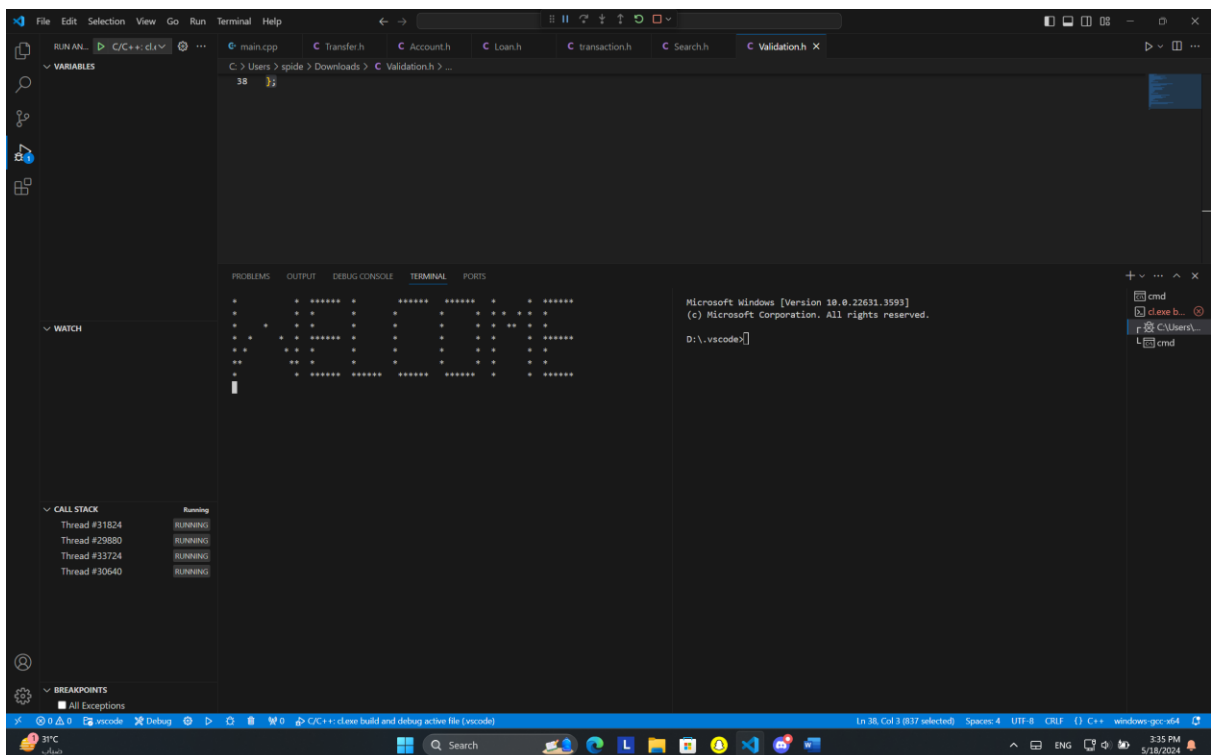
```

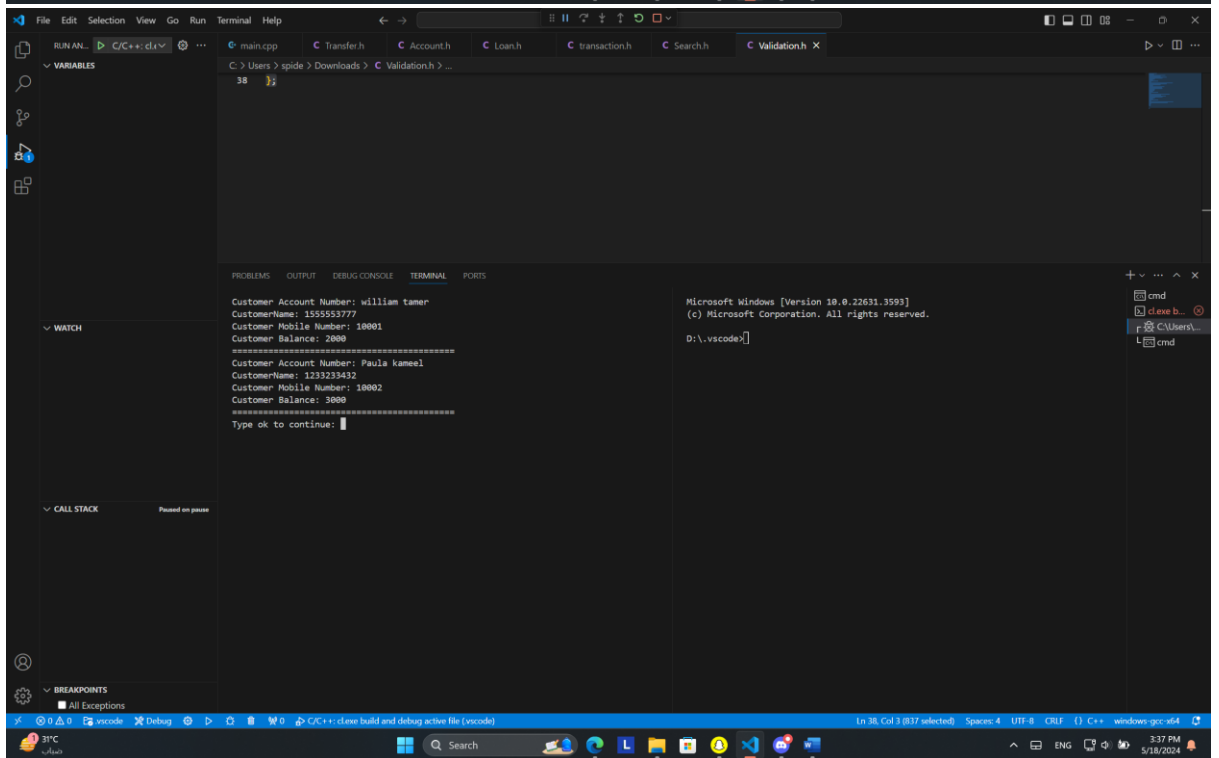
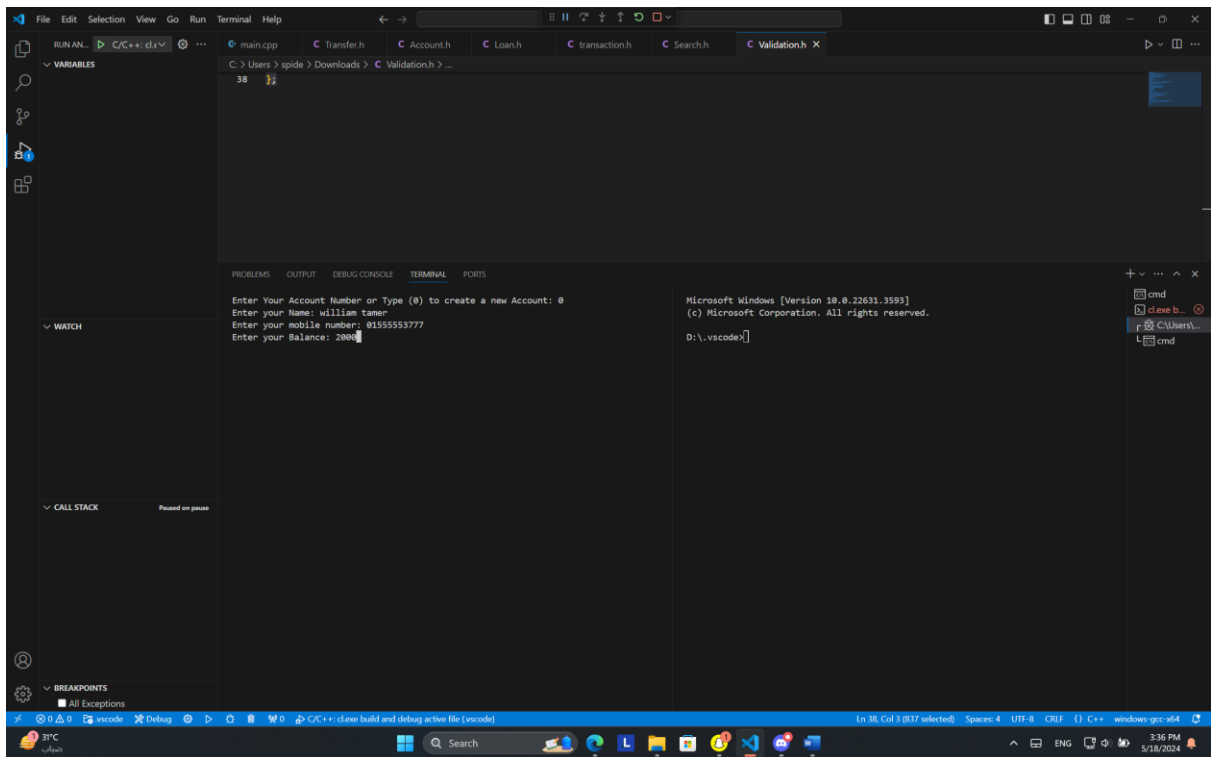
```

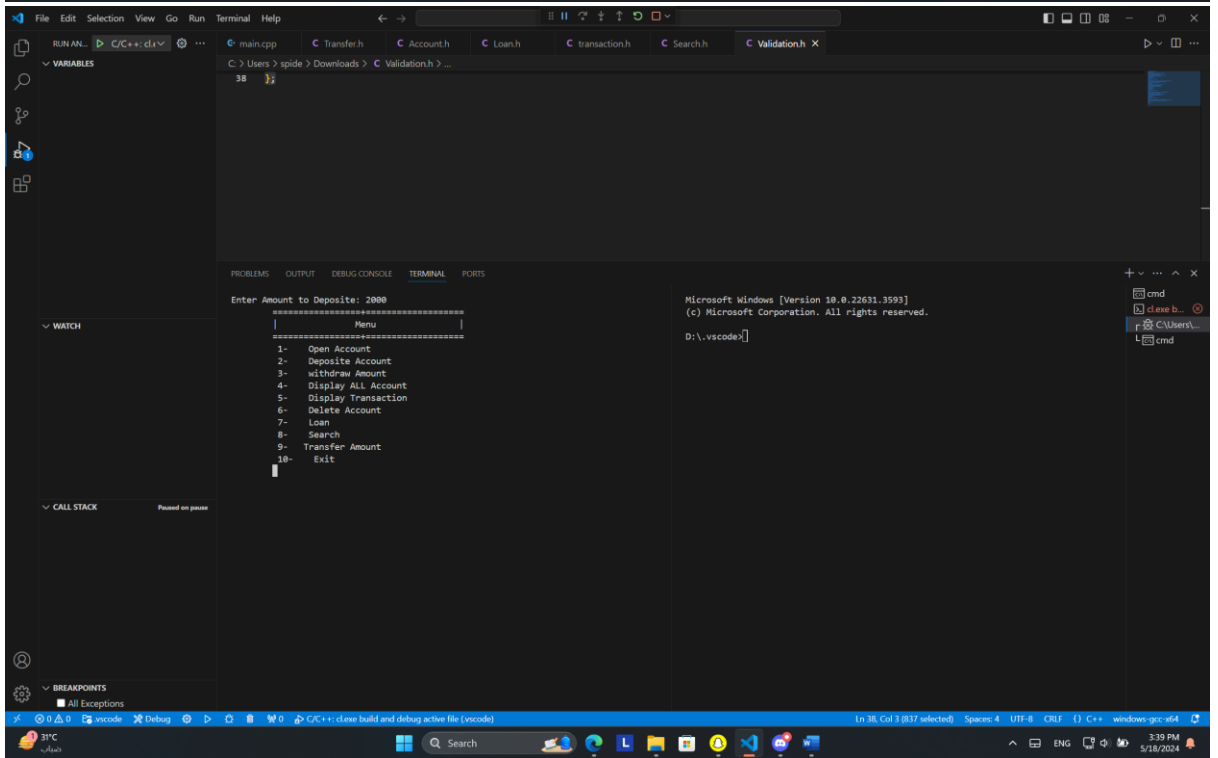
        else if(option == 2){
            cout<<"Type 1 to search by Date"<<endl;
            cout<<"Type 2 to search by TransactionID"<<endl;
            int option2;
            cin>>option2;
            switch (option2){
                case(1):{
                    char x [90];
                    cout<<"Enter the date of the transaction: ";
                    cin>>x;
                    search.searchByDate(x, it);
                    break;
                }
                case(2):{
                    break;
                }
            }
        }
        cout << "Type ok to continue: ";
        string dummy;
        cin >> dummy;
        system("cls");
        break;
    }
    case (9):{
        double amount;
        cout << "Enter Amount to transfer: ";
        cin >> amount;
        it->transferAmount(amount);
        break;
        break;
    }
    case (10): {
        t = false;
        break;
    }
    default:
        cout << "choose a valid choice" << endl;

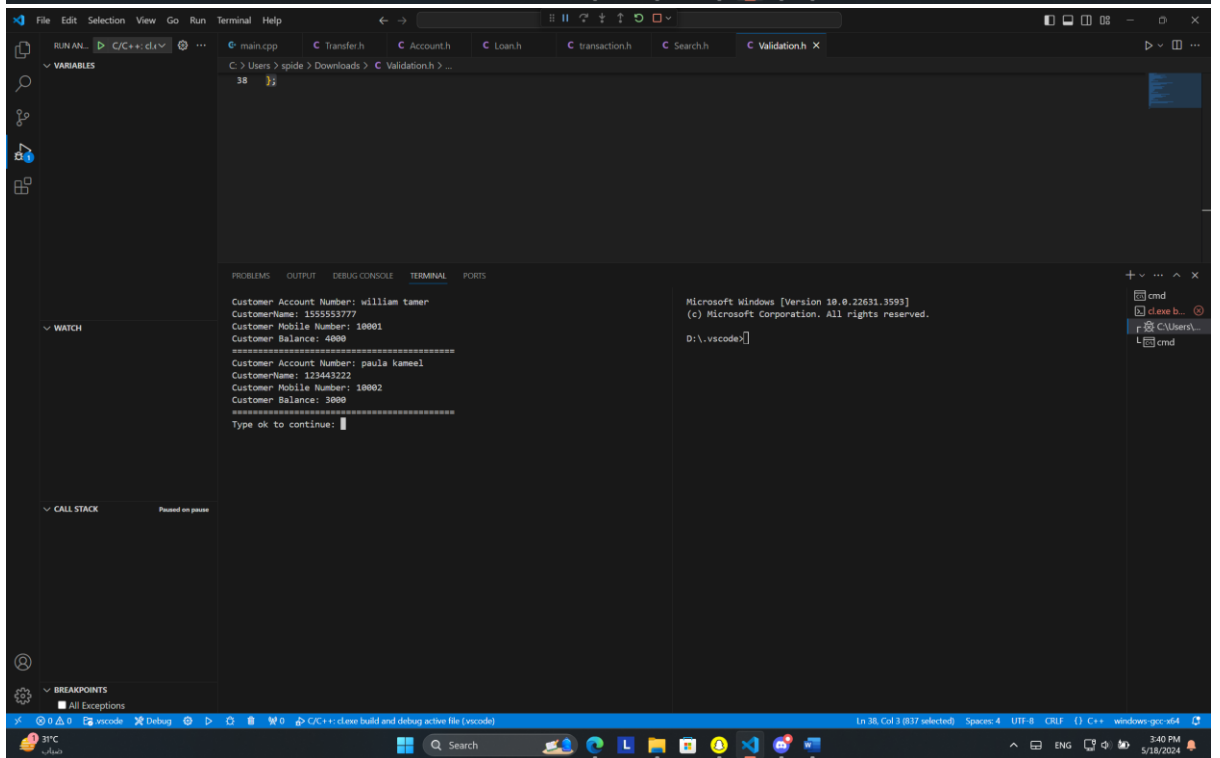
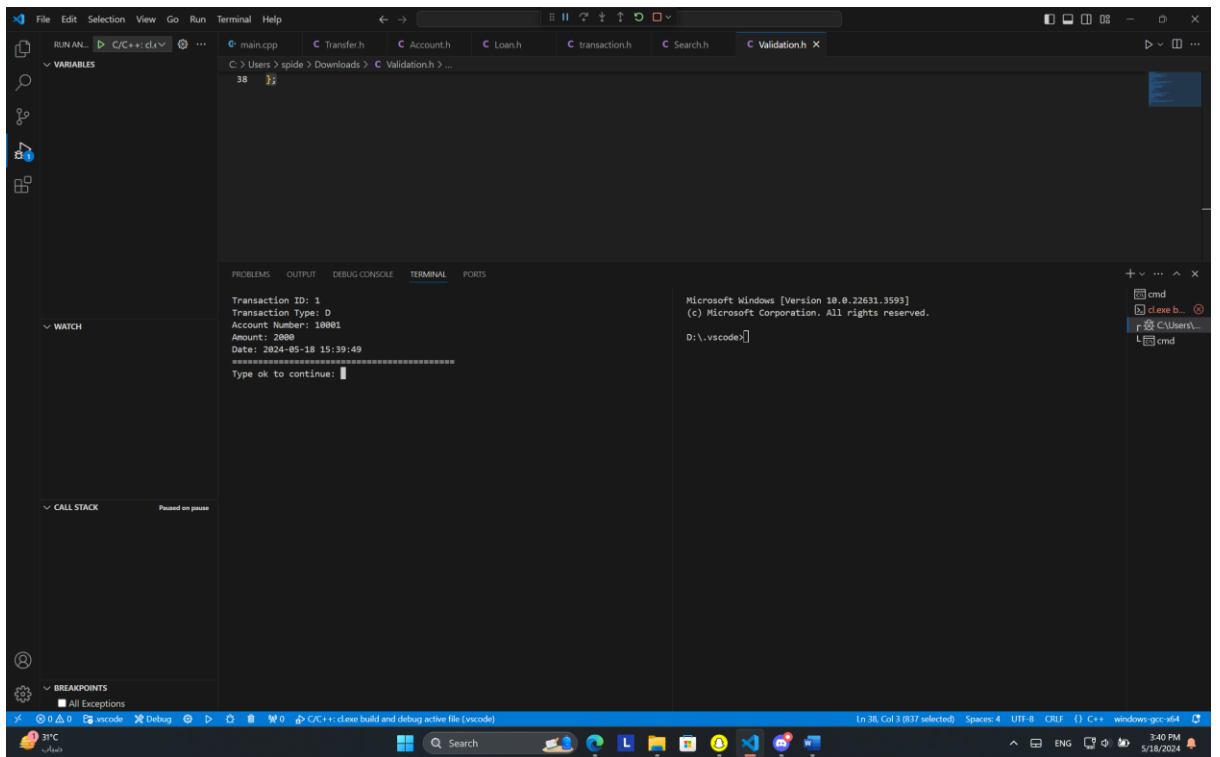
    }
}
}

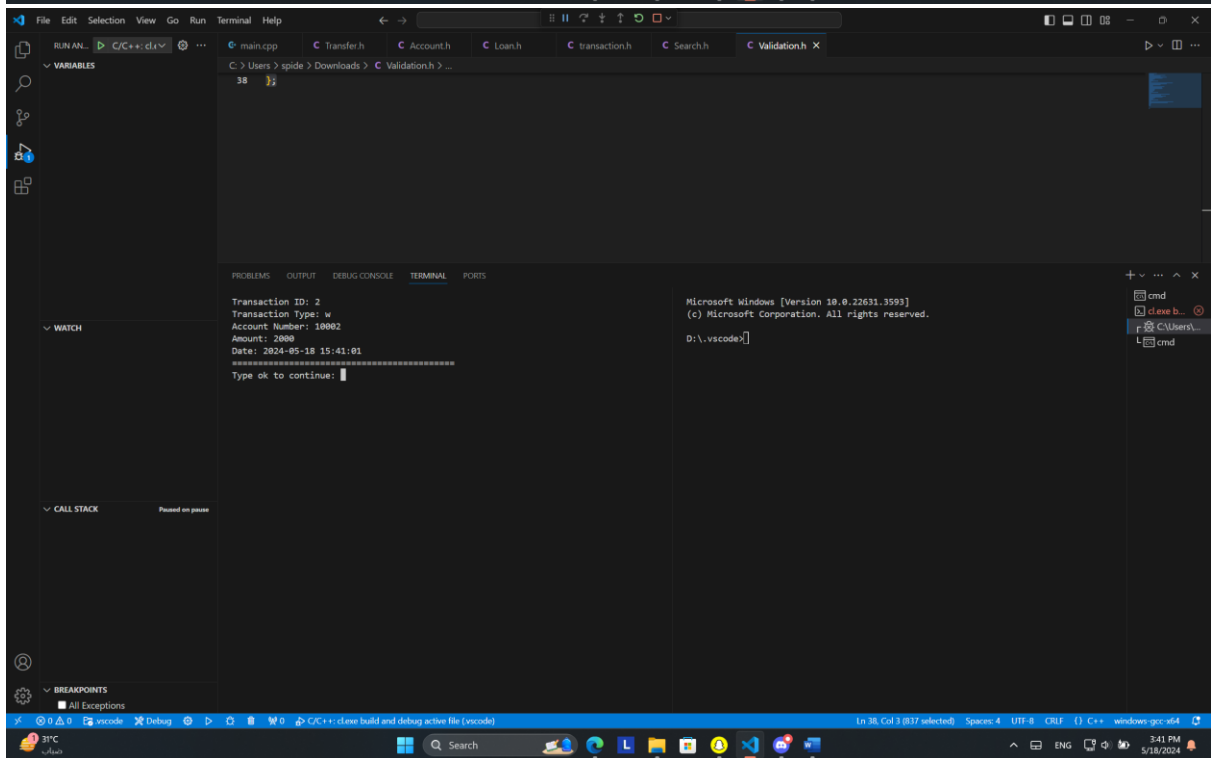
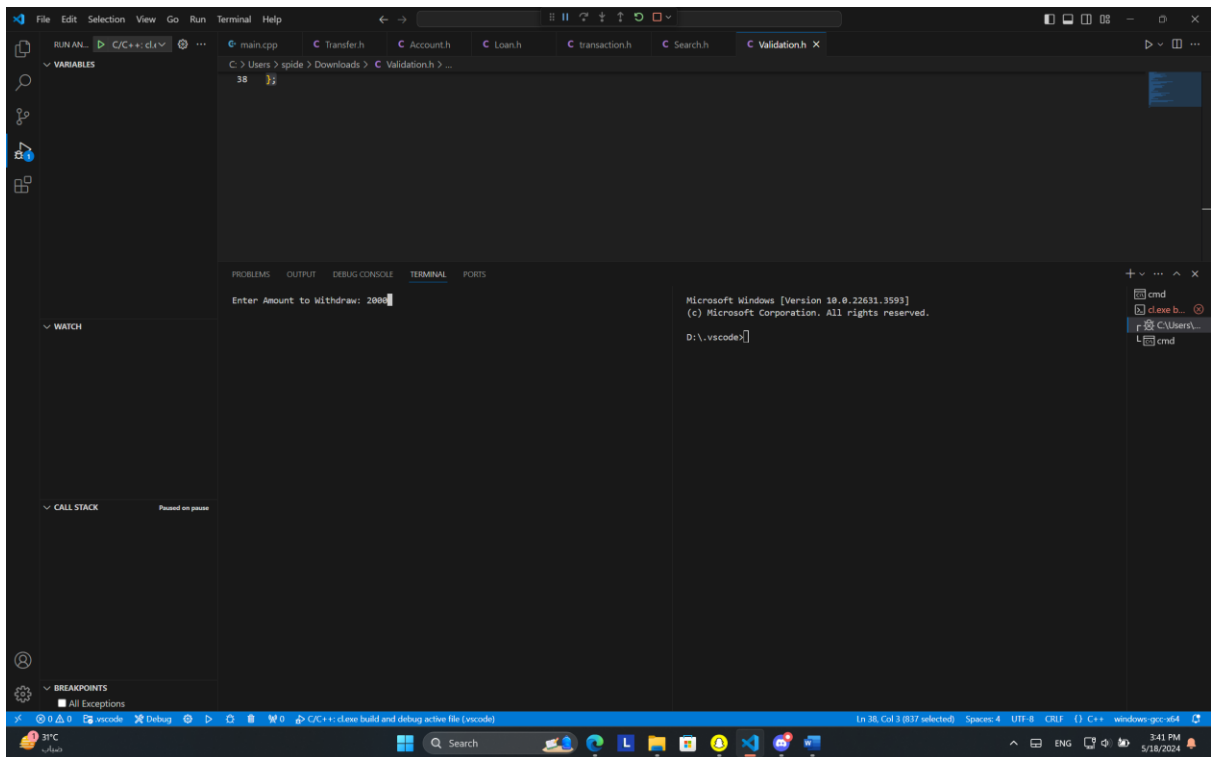
```











File Edit Selection View Go Run Terminal Help

main.cpp Transfer.h Account.h Loan.h transaction.h Search.h Validation.h

38

Customer Account Number: william tamer
CustomerName: 1555553777
Customer Mobile Number: 10001
Customer Balance: 4000
=====

Customer Account Number: paula kameel
CustomerName: 123443222
Customer Mobile Number: 10002
Customer Balance: 1000
=====

Type ok to continue:

Microsoft Windows [Version 10.0.22631.3593]
(c) Microsoft Corporation. All rights reserved.
D:\vscode

cmd
clear
cmd

31°C

vscode Debug C/C++: cl.exe build and debug active file (vscode) Ln 38, Col 3 (837 selected) Spans: 4 UTF-8 CRLF C++ windows gcc x64 3:41 PM 5/18/2024

File Edit Selection View Go Run Terminal Help

main.cpp Transfer.h Account.h Loan.h transaction.h Search.h Validation.h

38

Type 1 to search for an Account
Type 2 to search for a transaction

Microsoft Windows [Version 10.0.22631.3593]
(c) Microsoft Corporation. All rights reserved.
D:\vscode

cmd
clear
cmd

31°C

vscode Debug C/C++: cl.exe build and debug active file (vscode) Ln 38, Col 3 (837 selected) Spans: 4 UTF-8 CRLF C++ windows gcc x64 3:42 PM 5/18/2024

