ASSIGNMENT#05

COMPLEX ENGINEERING PROBLEM

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Section: A

Semester: 4th (improvement student)
previous grade was c+

Batch: 2nd

Submitted To:

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QUESTION PART 1 AND 2:

Apply the knowledge of Programming Fundamentals to analysis the problem statement and list all the facilities an ATM delivers.

ANSWER

INTRODUCTION

Key features of the ATM Machine

- The program will do some tasks mention below to operate the ATM Machine:
- The C Program can Display the ATM Transaction
- It has pin verification system to login to ATM Machine
- User can check balance from this ATM Machine project
- User can Withdraw Cash from ATM Machine
- User can Deposit Cash from ATM Machine

EXPLANATION:

1. OPEN OR WITHDRAW A FIXED DEPOSIT

We can open a fixed depost with your bank using an ATM.
Select open fixed deposit on the ATM menu ,select the duration enter the amount and confirm the other necessary details

2. MOBILE RECHARGE

Select 'Mobile Recharge', enter your mobile number or that of your friend or family member and re-confirm, then enter the recharge amount.

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3. PAY INCOME TAX

We can also pay income tax, including advance tax, self-assessment tax as well as tax due after regular assessment, through the ATMs of a select few banks. Simply register for the facility on the bank's website or branch. Once the amount is deducted from your account, the ATM will generate a unique number (CIN). Check the bank's website after 24 hours and print the challan using the CIN.

4. PAY INSURANCE PREMIUM

With LIC, HDFC Life and SBI Life tying up with banks to facilitate premium payment through ATMs, you just have to go to 'Bill Pay', select the insurer, enter policy number and date of birth or mobile number, enter premium amount and confirm.

5. APPLY FOR PERSONAL LOAN

Some private banks offer pre-approved personal loans using ATMs as the point of disbursal. The amount is decided using advanced analytics, which take into account the customer's transaction details, account balance, salary credits, and credit and debit card repayments.

6. TRANSFER CASH

Funds up to Rs 40,000 (daily, with no limit on the number of transactions) can be transferred from one bank account to that of another using an ATM. Just register the beneficiary account online or at the bank branch.

7. BILL PAYMENT

Register the biller on the bank's website before paying telephone, electricity, gas and other bills through ATMs

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QUESTION PART 3

Draw the flowchart of the task and name each process in such a manner that a non-technical person can easily interpret it

FLOW CHART

The process for cash withdrawal from ATM is described using the following Flowchart nodes:

Start

- Insert a credit/debit card
- Is card valid?
- Insert PIN code
- Hold the card

Choose Action

- Withdraw money
- Account balance
- Exit

✓ Choose the amount of money to withdraw

✓ Show account balance

✓ Sufficient funds on the account?

✓ Release money

✓ End

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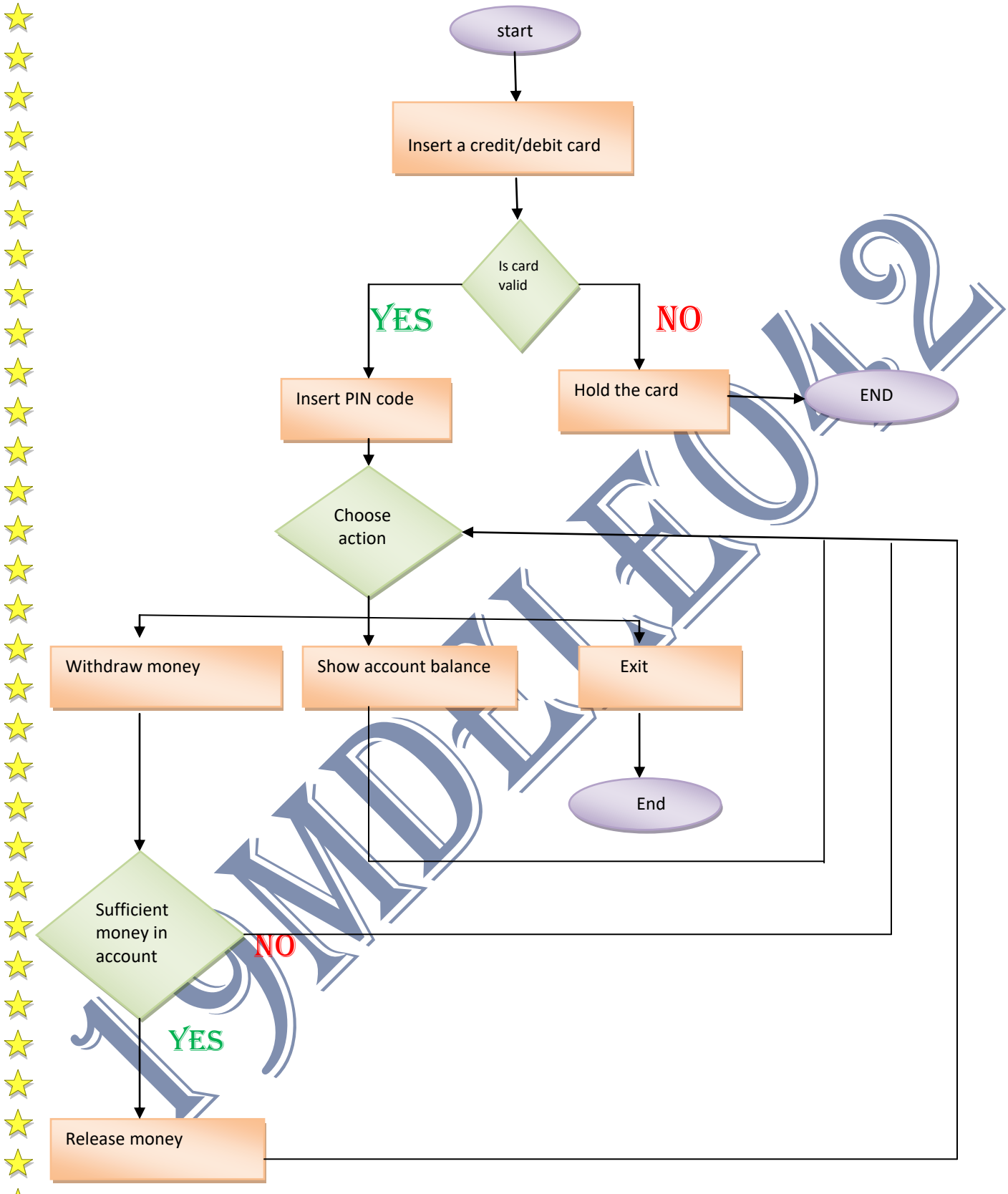
start
Insert a credit/debit card
Is card valid
YES
NO
Insert PIN code
Hold the card
END
Choose action
Withdraw money
Show account balance
Exit
End
Sufficient money in account
NO
YES
Release money

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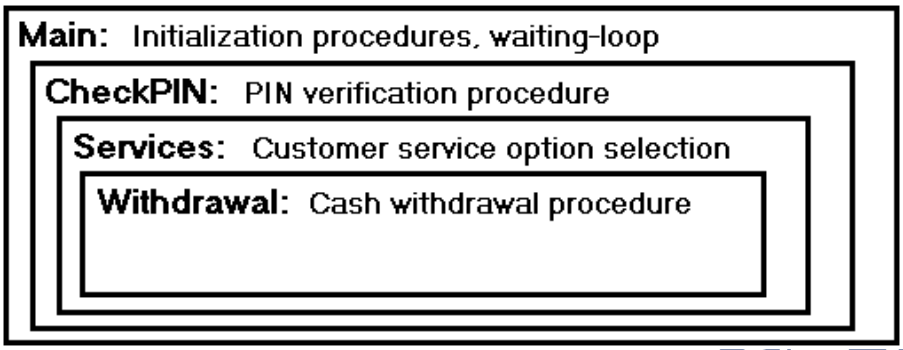
QUESTION PART 4

Write the Pseudocode of the whole process stated in (3).

PSEUDOCODE

The pseudocode below consists of a starting procedure called Main and three sub-procedures called CheckPIN, Services and Withdrawal.



MAIN

The Main procedure is called when the system is started. It consists of a loop which repeats until the system is switched off. The loop first checks the Control System to see if it is enabled. If not an 'out of service' message is displayed and the system then waits for the Control System to be enabled. If the Control System is enabled, the Card Reader is checked to see whether a card has been inserted. If not, an 'insert card' message is displayed. This message could include one of several informative messages or displays shown in rotation. If a card is detected in the Card Reader, the CheckPIN procedure is called.

```
PROCEDURE Main
BEGIN
 LOOP
   IF control system is disabled
     THEN BEGIN
       display 'out of service' message
       LOOP UNTIL control system is enabled
     END
     ELSE IF no card is inserted
       THEN display 'insert card' message
       ELSE CALL PROCEDURE CheckPIN
     ENDIF
   ENDIF
 ENDLOOP
 END Main
```

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CHECK PIN

The CheckPIN procedure handles the verification of the customer's Personal Identification Number (PIN) using data retrieved from the card's magnetic strip. The procedure invites the customer to enter their PIN using the keypad. If this does not match the PIN stored on the card a limited number of retries is permitted, after which the card is confiscated as a security precaution. If the correct PIN is entered, the Services procedure is called.

```
PROCEDURE CheckPIN
  CONSTANTS
        MAXPINS IS 3
 VARIABLES
    PINCounter IS NUMBER
BEGIN
 read data from card
 set PINCounter to zero
 LOOP UNTIL PINCounter is equal to MAXPINS
    input PIN from customer keypad
    IF entered PIN matches card PIN
       THEN EXITLOOP
    ENDIF
    add 1 to PINCounter
 ENDLOOP
 IF PINCounter is equal to MAXPINS
    THEN confiscate customer's card
    ELSE CALL PROCEDURE Services
 ENDIF
END CheckPIN
```

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SERVICES

The Services procedure presents a menu of the options which are currently available to customers. The customer selects an option by pressing a key on the keypad. The key is identified and the relevant option is activated. After processing an option the procedure will do one of two things. If a 'Withdrawal...' or 'Return Card' option was selected, the procedure will terminate. If any one of the other options were selected, the selection process is repeated to allow the customer to use another service. The options which request a cash withdrawal call the Withdrawal procedure.

PROCEDURE Services

```
VARIABLES
 ExitServicesFlag IS BOOLEAN
BEGIN
 RESET ExitServicesFlag
 LOOP UNTIL ExitServicesFlag is SET
    display customer services
    input selection from keypad
    CASE OF selection:
       WHEN withdrawal with receipt
       BEGIN
          CALL PROCEDURE Withdrawal (with_receipt)
          SET ExitServicesFlag
       END
       WHEN withdrawal without receipt
       BEGIN
          CALL PROCEDURE Withdrawal (no_receipt)
          SET ExitServicesFlag
       END
       WHEN display balance
          get and display balance
       WHEN print balance
          get and print balance
       WHEN order statement
          send statement order to control system
       WHEN order chequebook
          send chequebook order to control system
       DEFAULT
          return customer's card
          SET ExitServicesFlag
    ENDCASE
 ENDLOOP
END Services
```

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WITHDRAWAL

The Withdrawal procedure handles the process of withdrawing cash from the customer's account. It receives one parameter which indicates the type of withdrawal (ie. with or without a printed receipt). The customer is first presented with a list of cash values to select from and an option to enter their own value explicitly. Once a value has been specified, the customer's account details are checked in the Accounts Database. If there are no funds available, the customer is informed, the card is returned and the procedure terminates. If the customer has insufficient funds to cover the requested amount, the actual amount available is offered. If this reduced offer is declined, the customer's card is returned and the procedure terminates. If an available amount is specified, the card is first returned to ensure it is not forgotten. The cash is then dispensed and, if required, a receipt is printed. The customer's account details are then updated in the Accounts Database and the procedure terminates.

```
PROCEDURE Withdrawal
VARIABLES
  Amount IS NUMBER
BEGIN
  input Amount from customer keypad
  read customer's details from accounts database
  IF customer has insufficient funds
    THEN IF customer has zero funds
      THEN BEGIN
        display 'insufficient funds' message
        set Amount to zero
      END
      ELSE BEGIN
        display offer of available funds
        input customer's response (Y/N)
        IF response is 'Y'
          THEN set reduced Amount
          ELSE set Amount to zero
        ENDIF
      END
    ENDIF
  ENDIF
  return customer's card
  IF Amount is not zero
    THEN BEGIN

dispense cash Amount
      IF WithdrawalType is with_receipt
        THEN print receipt for Amount
      ENDIF
      update accounts database
    END
  ENDIF
END Withdraw
```

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QUESTION PART 5,6

Write the C Program with basic component to achieve the list of facilities as in (2) and in then loop the program for continuous usage,

Show the output in assignment for various processes and write the github link in the submission for revisiting your code.

C PROGRAM

C:\Users\M TAYYAB M\Desktop\ATM tayyab.c - Dev-C++ 5.4.2

File Edit Search View Project Execute Tools CVS Window Help

(globals)

Project Classes Debug | ATM tayyab.c

```c
#include <stdio.h>
#include <stdlib.h>
#include <stdbool.h>
#include <math.h>

                                    //Functions
void login();
void mainMenu();
void checkBalance(float balance);
float moneyDeposit(float balance);
float moneyWithdraw(float balance);
void menuExit();
void errorMessage();
                                //Main Code
int main() {

                            //Local Declarations
        int option;
        float balance = 15000.00;
        int choose;
        bool again = true;
                            // insert code here...
         while (again) {
        mainMenu();

        printf("=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-\n");
        printf("Your Selection:\t");
        scanf("%d", &option);

         switch (option) {
                case 1:
                    system("CLS");
                    checkBalance(balance);
                    break;
                case 2:
                    system("CLS");
                    balance = moneyDeposit(balance);
                    break;
                case 3:
                    system("CLS");
                    balance = moneyWithdraw(balance);
                    break;

                case 4:
                    system("CLS");
                    menuExit();
                    return 0;

                default:
                    errorMessage();
                    break;
         }
```

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(globals)

Project Classes Debug | ATM tayyab.c

```c

        printf("=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-\n");
        printf("Would you like to do another transaction:\n");
        printf("< 1 > Yes\n");
        printf("< 2 > No\n");
        scanf("%d", &choose);

        system("CLS");

         if (choose == 2) {
            again = false;
            menuExit();
         }

    }
    return 0;
}//main code
//Functions

void mainMenu() {
    printf("***M.TAYYEB & REG NO:19MDELE042***\n");
    printf("**********Welcome to ATM Banking***********\n\n");
    printf("****Please choose one of the options below****\n\n");
    printf("< 1 >  Check Balance\n");
    printf("< 2 >  Deposit\n");
    printf("< 3 >  Withdraw\n");
    printf("< 4 >  Exit\n\n");
```

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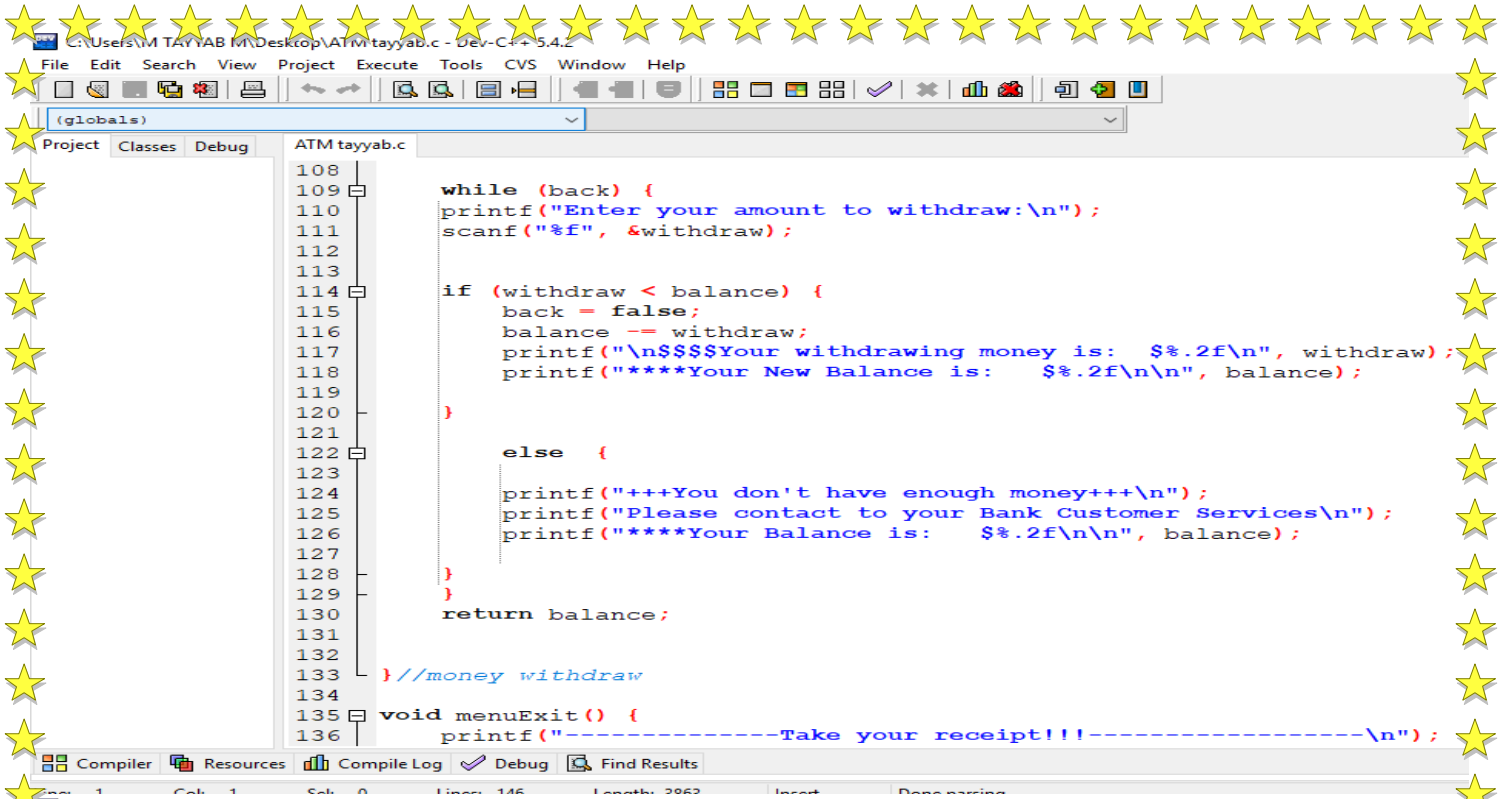
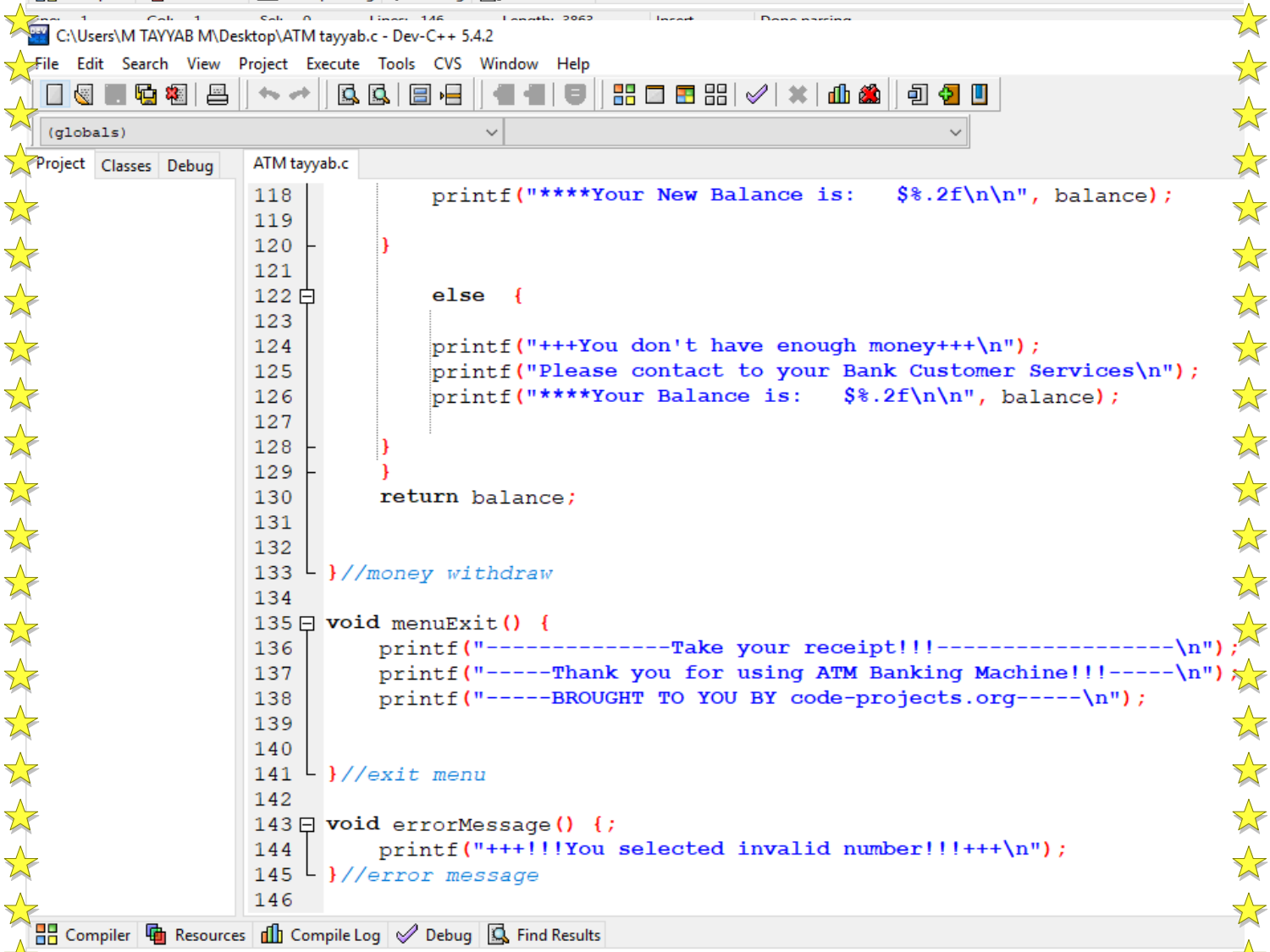
(globals)

Project Classes Debug | ATM tayyab.c

```c

}//Main Menu

void checkBalance(float balance) {
    printf("You Choose to See your Balance\n");
    printf("\n\n****Your Available Balance is:   $%.2f\n\n", balance);

}//Check Balance

float moneyDeposit(float balance) {
    float deposit;
    printf("You choose to Deposit a money\n");
    printf("$$$$Your Balance is: $%.2f\n\n", balance);
    printf("****Enter your amount to Deposit\n");
    scanf("%f", &deposit);

   balance += deposit;
  printf("\n****Your New Balance is:   $%.2f\n\n", balance);
    return balance;

}//money deposit

float moneyWithdraw(float balance) {
    float withdraw;
    bool back = true;

    printf("You choose to Withdraw a money\n");
    printf("$$$$Your Balance is: $%.2f\n\n", balance);
```



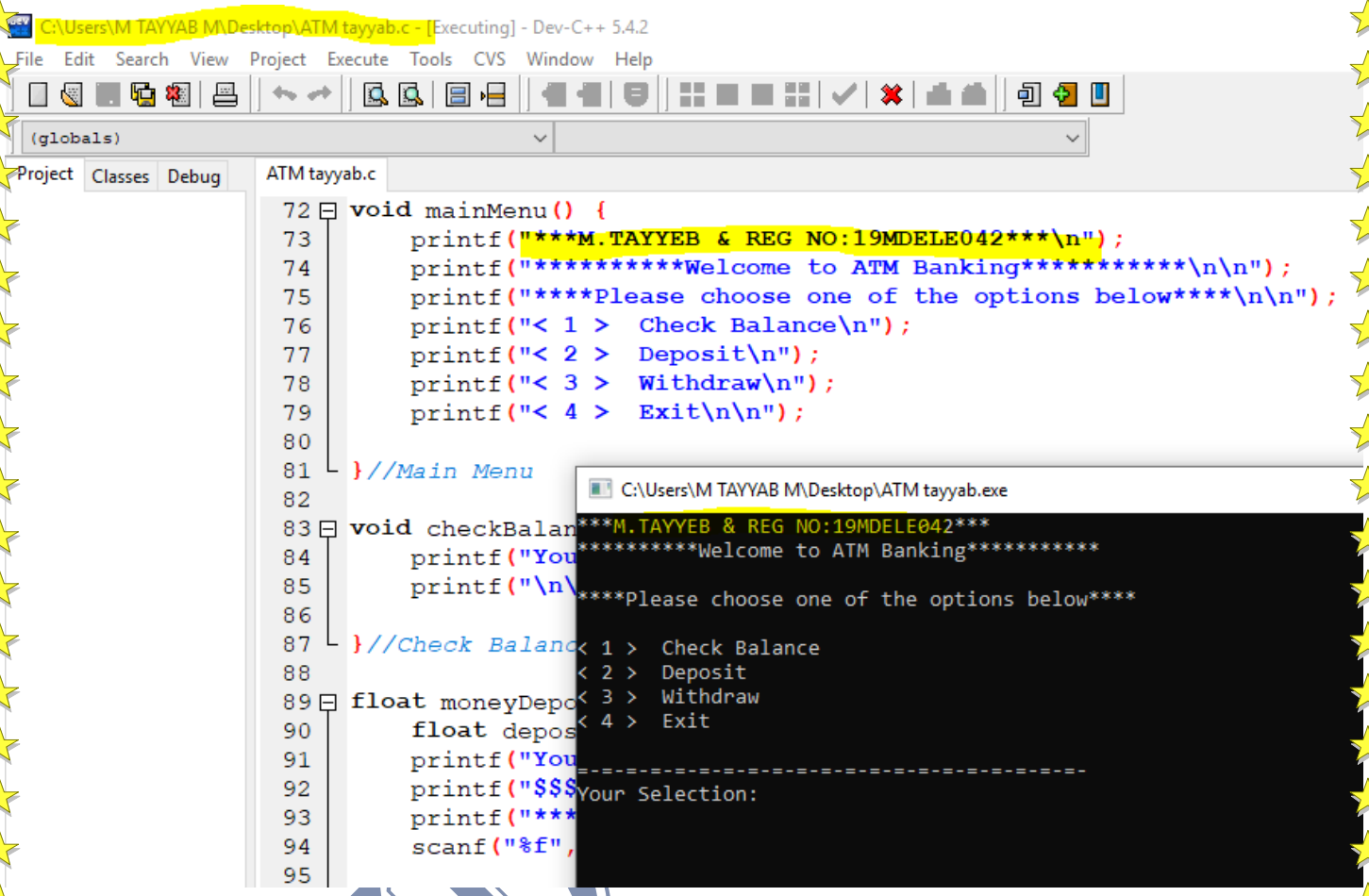
```
108
109         while (back) {
110         printf("Enter your amount to withdraw:\n");
111         scanf("%f", &withdraw);
112
113
114         if (withdraw < balance) {
115             back = false;
116             balance -= withdraw;
117             printf("\n$$$$Your withdrawing money is:  $%.2f\n", withdraw);
118             printf("****Your New Balance is:   $%.2f\n\n", balance);
119
120         }
121
122             else  {
123
124             printf("+++You don't have enough money+++\n");
125             printf("Please contact to your Bank Customer Services\n");
126             printf("****Your Balance is:   $%.2f\n\n", balance);
127
128         }
129         }
130         return balance;
131
132
133 }//money withdraw
134
135 void menuExit() {
136     printf("--------------Take your receipt!!!------------------\n");
```



```
118             printf("****Your New Balance is:   $%.2f\n\n", balance);
119
120         }
121
122             else  {
123
124             printf("+++You don't have enough money+++\n");
125             printf("Please contact to your Bank Customer Services\n");
126             printf("****Your Balance is:   $%.2f\n\n", balance);
127
128         }
129         }
130         return balance;
131
132
133 }//money withdraw
134
135 void menuExit() {
136     printf("--------------Take your receipt!!!------------------\n");
137     printf("-----Thank you for using ATM Banking Machine!!!-----\n");
138     printf("-----BROUGHT TO YOU BY code-projects.org-----\n");
139
140
141 }//exit menu
142
143 void errorMessage() {;
144     printf("+++!!!You selected invalid number!!!+++\n");
145 }//error message
146
```

OUT PUT

Here we have 4 options



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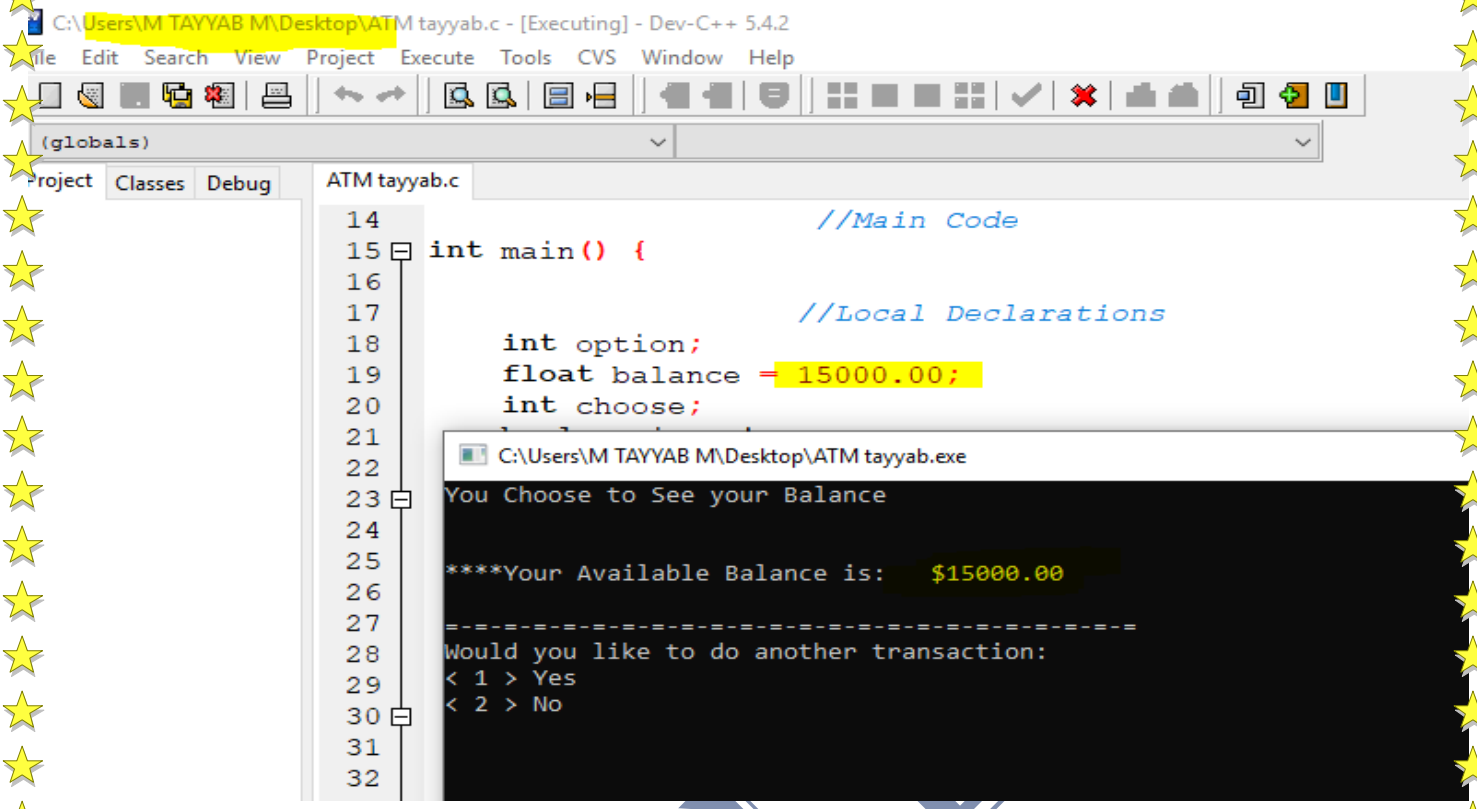
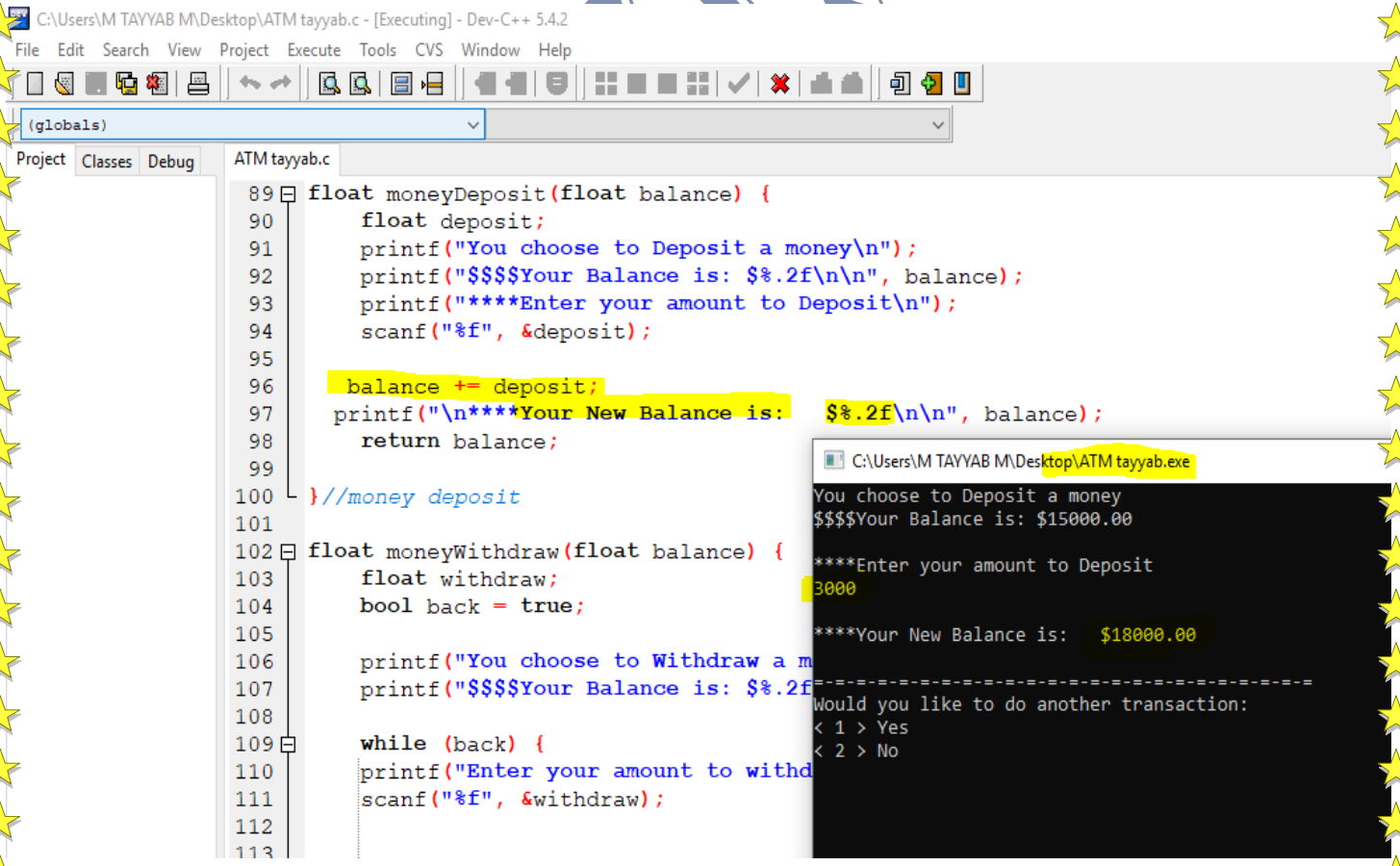
CHECKING BALANCE



DEPOSIT MONEY



WITHDRAW MONEY

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(globals)

roject Classes Debug

ATM tayyab.c

```
107         printf("$$$$Your Balance is: $%.2f\n\n", balance);
108
109         while (back) {
110         printf("Enter your amount to withdraw:\n");
111         scanf("%f", &withdraw);
112
113
114         if (withdraw < balance) {
115             back = false;
116             balance -= withdraw;
117             printf("\n$$$$Your withdrawing money is:  $%.2f\n", withdraw);
118             printf("****Your New Balance is:   $%.2f\n\n", balance);
119
120         }
121
122             else  {
123
124             printf("+++You don't ha
125             printf("Please contact
126             printf("****Your Balanc
127
128         }
129         }
130         return balance;
131
132
133 }//money withdraw
```

C:\Users\M TAYYAB M\Desktop\ATM tayyab.exe

```
You choose to Withdraw a money
$$$$Your Balance is: $18000.00

Enter your amount to withdraw:
7000

$$$$Your withdrawing money is:  $7000.00
****Your New Balance is:   $11000.00

================================================
Would you like to do another transaction:
< 1 > Yes
< 2 > No
```

WHEN I WANT TO WITHDRAW MORE THAN MY CURRENT BALANCE

C:\Users\M TAYYAB M\Desktop\ATM tayyab.c - [Executing] - Dev-C++ 5.4.2

File Edit Search View Project Execute Tools CVS Window Help

(globals)

Project Classes Debug

ATM tayyab.c

```
107         printf("$$$$Your Balance is: $%.2f\n\n", balance);
108
109         while (back) {
110         printf("Enter your amount to withdraw:\n");
111         scanf("%f", &withdraw);
112
113
114         if (withdraw < balance) {
115             back = false;
116             balance -= withdraw;
117             printf("\n$$$$Your withdrawing money is:  $%.2f\n", withdraw);
118             printf("****Your New Balance is:   $%.2f\n\n", balance);
119
120         }
121
122             else  {
123
124             printf("+++You don't hav
125             printf("Please contact t
126             printf("****Your Balance
127
128         }
129         }
130         return balance;
131
132
133 }//money withdraw
```

C:\Users\M TAYYAB M\Desktop\ATM tayyab.exe

```
You choose to Withdraw a money
$$$$Your Balance is: $11000.00

Enter your amount to withdraw:
13000
+++You don't have enough money+++
Please contact to your Bank Customer Services
****Your Balance is:   $11000.00

Enter your amount to withdraw:
```

2nd Transaction

```
if (withdraw < balance) {
    back = false;
    balance -= withdraw;
    printf("\n$$$$Your withdrawing money is:  $%.2f\n", withdraw);
    printf("****Your New Balance is:   $%.2f\n\n", balance);

}

    else  {

    printf("+++You
    printf("Please
    printf("****Yo

}
}
return balance;

/money withdraw

id menuExit() {
```

Log | Debug | Find Results

```
C:\Users\M TAYYAB M\Desktop\ATM tayyab.exe
You choose to Withdraw a money
$$$$Your Balance is: $11000.00

Enter your amount to withdraw:
13000
+++You don't have enough money+++
Please contact to your Bank Customer Services
****Your Balance is:   $11000.00

Enter your amount to withdraw:
7000

$$$$Your withdrawing money is:  $7000.00
****Your New Balance is:   $4000.00

--------------------------------------------------
Would you like to do another transaction:
< 1 > Yes
< 2 > No
```

EXIT

```
34
35  void menuExit() {
36      printf("--------------Take your receipt!!!------------------\n");
37      printf("-----Thank you for using ATM Banking Machine!!!-----\n");
38      printf("-----BROUGHT TO YOU BY code-projects.org-----\n");
39
40
41  }//exit menu
42
43  void errorMessage()
44      printf("+++!!!Yo
45  }//error message
46
```

Compile Log | Debug | Find Resul

```
C:\Users\M TAYYAB M\Desktop\ATM tayyab.exe
--------------Take your receipt!!!------------------
-----Thank you for using ATM Banking Machine!!!-----
-----BROUGHT TO YOU BY code-projects.org-----

--------------------------------
Process exited with return value 0
Press any key to continue . . .
```

**********THE END**********