Assignment Week 9

CT103
C Programming

Submission:

REMEMBER: All files MUST be submitted

before you leave the lab *(even if you don't get it working!)*

You must be marked present by the lab tutor, and they must see your finished program before you leave

USE CORRECT FILE NAME AS PER INSTRUCTIONS

The tutors are there to help you - don't hesitate to ask for help

Assignment

- *This assignment is to create a program that uses a data structure to hold information on bank accounts: account number, balance, interest and tax. You will need to create an additional .h file to contain the following:*

```
struct account
{
        int num;
        double balance;
        double interest;
        double tax;
};

void printAccounts(struct account accounts[], int num);
double calcInterest (double balance);
double calcTax (double interest);
void printAccount(struct account anAccount);
void setupAccounts (struct account accounts[], int num);
void updateAccounts(struct account accounts[], int num);
#define interestRate 0.025
#define taxRate 0.25
```

- *The .cpp file containing your main should look like this:*

```cpp
#include "stdafx.h"
#include <stdio.h>
#include <stdlib.h>
#include "accounts.h"

void main()
{
        struct account accounts[10];
        setupAccounts (accounts, 10);
        printf ("Balances before calculations: \n");
        printAccounts(accounts, 10);
        updateAccounts (accounts, 10);
        printf ("Balances after calculations: \n");
        printAccounts(accounts, 10);
}
```

- *You will need to create an additional .cpp file containing the implementation of the functions defined in the accounts.h file:*

```cpp
// sets up the array of accounts with random balances and account numbers
void setupAccounts (struct account accounts[], int num);

// uses calcInterest and calcTax to calculate the interest and tax, and
update the account balances
void updateAccounts(struct account accounts[], int num);

// calculates the interest on the balance, using the interest rate defined
in accounts.h
double calcInterest (double balance);

// calculates the tax on the interest, using the tax rate defined in
accounts.h
double calcTax (double interest);

// uses printAccount to print out an array of accounts
void printAccounts(struct account accounts[], int num);

// prints an individual account
void printAccount(struct account anAccount);
```
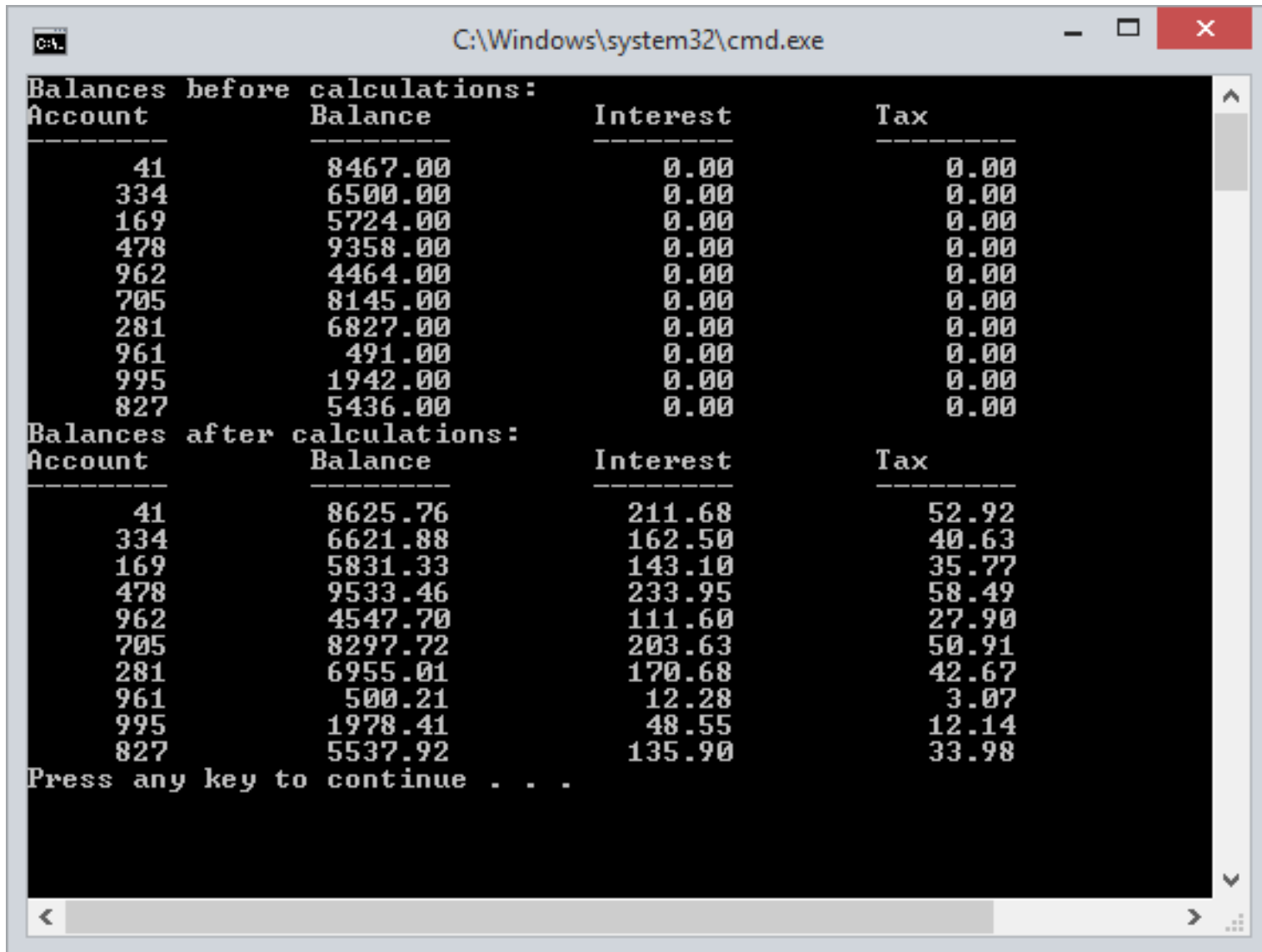
- ***Sample Output:***


```
C:\Windows\system32\cmd.exe                                     _ □ ×

Balances before calculations:
Account          Balance          Interest          Tax
_____          _____          _____          _____
       41          8467.00             0.00             0.00
      334          6500.00             0.00             0.00
      169          5724.00             0.00             0.00
      478          9358.00             0.00             0.00
      962          4464.00             0.00             0.00
      705          8145.00             0.00             0.00
      281          6827.00             0.00             0.00
      961           491.00             0.00             0.00
      995          1942.00             0.00             0.00
      827          5436.00             0.00             0.00
Balances after calculations:
Account          Balance          Interest          Tax
_____          _____          _____          _____
       41          8625.76           211.68            52.92
      334          6621.88           162.50            40.63
      169          5831.33           143.10            35.77
      478          9533.46           233.95            58.49
      962          4547.70           111.60            27.90
      705          8297.72           203.63            50.91
      281          6955.01           170.68            42.67
      961           500.21            12.28             3.07
      995          1978.41            48.55            12.14
      827          5537.92           135.90            33.98
Press any key to continue . . .
```