VGP110 – Procedural Programming in C I

Instructor: Muntaseer Salahuddin

Final Exam: Summer 2011

Total Points: 50

Total Time: 120 minutes

Last Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

First Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student #: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Signature (*Bank Signature*): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**INSTRUCTIONS:**

* Please fill in the information above very clearly.
* Do not open this test booklet until instructed to do so.
* Show all your workings. *Failure to show workings will result in a 0 for that question, regardless if the answer is correct.*
* Please write all your answers in this booklet. You will not be given any extra pages to write your answers.
* There is partial marking where appropriate, so answer as much as you can.
* There are 3 questions in total.
* Good luck!

1. [10 points] Write a function [with the prototype **float Round(float,int)**] that accepts a floating point number NUM and an integer DIGITS as argument and returns NUM rounded with DIGITS amount of decimal places kept after the decimal point.

So, **Round( 3.456, 2 )** will return **3.46**

**Round( 3.456, 0 )** will return **3**

1. [20 points] Write a program that asks the user how many strings they are going to enter (this number, N, will be between 1 and 100; if not then ask for input again till correct number is entered), then reads the N strings, and finally outputs all the strings that begin with "ai" in the reverse order. You MUST use the *strcmp(...)* function in your code.

**SAMPLE INPUT and OUTPUT**:

*(input has been* ***highlighted****)*

How many strings?***-12***

Number must be between 1 and 100 inclusive***0***

Number must be between 1 and 100 inclusive***120***

Number must be between 1 and 100 inclusive***3***

Enter a string:

***aisdg***

Enter a string:

***a idfg***

Enter a string:

***asdfgi***

Enter a string:

***ai***

Strings that begin with "ai" in reverse are:

ai

aisdg

Press any key to continue . . .

1. [20 points] Create an array called ACCOUNTS to hold account balance of customers in a bank. Account balance is stored with two decimal places after the decimal point.

Create an array of 100 ACCOUNTS and write a function called InitializeAccounts that initializes each of the 100 accounts. Each account should be initialized with a random balance (between 1000 and 10,000).

After initializing, display the account information of each account, i.e. Account # and Balance. As well generate a random Interest Rate (a number between 0.00 and 6.99, yes this random number has a random integer component as well a random 2 decimal place floating point component), and then display the Interest (balance \* interest rate) that has been accrued on the account.

As you go through each account present the user with the option of either Depositing / Withdrawing / Choosing to do neither. If the user chooses to do neither your program should simply move to the next account, otherwise the account information should be updated and displayed again and then your program will move to the next account (i.e. user gets to do max one task each round). Remember that for Withdrawal your program should check if the account has sufficient funds. If not then inform the user of the issue and move to the next account, no money leaves the account.

Your program must have well defined functions and their prototypes to achieve full marks. You SHOULD NOT pass the accounts array around in your code, in fact all changes to the accounts array must be done through the use of pointers.

**SAMPLE INPUT and OUTPUT**:

*(input has been* ***highlighted****)*

Account #: 1

Balance: 1041

Interest Rate: 4.56

Interest: 47.47

Select one of the following options:

1 - Deposit

2 - Withdraw

3 - Done

***1***

How much would you like to deposit?***5200***

Account #: 1

Balance: 6241

Interest Rate: 4.56

Interest: 284.59

Account #: 2

Balance: 7334

Interest Rate: 4.73

Interest: 346.90

Select one of the following options:

1 - Deposit

2 - Withdraw

3 - Done

***2***

How much would you like to withdraw?***7800***

Sorry, withdrawal amount exceeds allowed limits!

Account #: 2

Balance: 7334

Interest Rate: 4.73

Interest: 346.90

Account #: 3

Balance: 2167

Interest Rate: 2.18

Interest: 47.24

Select one of the following options:

1 - Deposit

2 - Withdraw

3 - Done

***3***

Account #: 3

Balance: 2167

Interest Rate: 2.18

Interest: 47.24

Press any key to continue . . .