CS36 Lab 2

(5 points total 0.5 points for each question)

Decision Statements (If, switch, loops only-Lesson 1 to Lesson 32)

(no functions, arrays or anything else we have not covered in class,

you can declare strings as `char strname[value]`)

3 test runs for each question

Save you lab file as lastname_firstinitial_lab02.txt

1. Follow the Lab instructions and video on how to submit labs.
2. Follow the steps in the Lab instruction sample on Canvas to separate each question with a banner with question number, short description of the question.
3. For each question you must provide output for 3 test runs (use the sample test run data already provided plus makeup the rest yourself). If you do not have 3 test runs total, that question will result in a zero.
4. You must use the data given in the sample test runs that are given in the question. Provide your own data whenever there is no sample run data.
5. If the program does not run a zero will be given
6. If the program runs but does not fulfill all the specifications stated in the question, a zero score will be given.
7. You are not allowed to use functions, arrays, #include<math.h>, #include<iostream>, #include<stdlib.h>, #include<string.h>, and any topics not covered from lesson 1 to lesson 32.
8. Using any other topics not covered in lesson 1 to lesson 32 will result in a zero for that question.

The *break*, *continue* and *goto* C commands are NOT ALLOWED to be used. A zero will be given if your program contains a break, continue or goto command. The break command is allowed only as part of the switch statement.

(User inputs in blue)

1. Write a program to determine whether the character entered is a vowel(a-e-i-o-u-A-E-I-O-U) or not. (use if -else if- else)

   Sample Test Run 1
   Enter any character : h
   h is not a vowel

   Sample Test Run 2
   Enter any character : i
   i is a vowel

2. Write a program to take input from the user and then check whether it is a digit 0 to 9(0-9 as character) or a character A to Z and a to z. If it is a character, determine whether it is in uppercase or lowercase. If it is a digit between 0 to 9 display "A digit was entered".

   Sample Test Run 1
   Enter any character : C
   Uppercase character was entered

   Sample Test Run 2
   Enter any character : b
   Lowercase character was entered

   Sample Test Run 3
   Enter any character : 5
   A digit was entered

3. Write a program to test whether an integer entered is positive, negative or equal to zero.

   Sample Test Run 1
   Enter any number: 0
   The number is equal to zero

   Sample Test Run 2
   Enter any number: 15
   The number is positive

   Sample Test Run 3
   Enter any number: -25
   The number is negative

4. Using switch statements. Write a program to determine an entered character is a vowel or not. Your program should be able to handle both upper and lowercase entered by user.(user will enter only A to Z and a-z only no numbers)

   Sample Test Run 1
   Enter a character : b
   b is not a vowel

   Sample Test Run 2
   Enter a character : B
   B is not a vowel

Sample Test Run 3
Enter a character : e
e is a vowel

5. Write a program that accepts a number from 1 to 10. Print whether the number is even or odd using a switch case construct. If the number entered is not between 1 to 10 display "Number entered is outside range".

   Sample Test Run 1
   Enter a number between 1 to 10 : **5**
   You entered 5. That is an odd number.

   Sample Test run 2
   Enter a number between 1 to 10 : **12**
   Number entered is outside the range.

   Sample Test run 3 (provide your own data)

For Q6 and Q7 Use a while loop

6. Write a program to read the numbers until -1 is encountered. Also, count the negative, positive, and zeroes entered by the user. The -1 will not be counted since it is a flag or sentinel.

   Sample Test run:

```
Test Run 1
Enter any number , -1 to quit : -12
Enter any number , -1 to quit : 108
Enter any number , -1 to quit : -24
Enter any number , -1 to quit : 0
Enter any number , -1 to quit : -23
Enter any number , -1 to quit : -1

Count of positive numbers entered = 1
Count of negative numbers entered = 3
Count of zeroes numbers entered = 1

Test Run 2
(provide your own test input data)

Test Run 3
(provide your own test input data)
```

7. Write a program to calculate the sum of numbers from m to n. For example, if use enters m = 7 and n = 11, your program will calculate 7 + 8 + 9 + 10 + 11 = 45

   Sample Test Run

```
Test Run 1
Enter the value of m : 7
Enter the value of n : 11
Sum = 45

Test Run 2
(provide your own test input data)

Test Run 3
```

8. Write a program using a **do-while loop** to display the square and cube of first n natural numbers.

Sample Test Run

```
Test Run 1
Enter the value of n : 5

-----------------------------------------------
|       1     |       1       |      1        |
|       2     |       4       |      8        |
|       3     |       9       |      27       |
|       4     |       16      |      64       |
|       5     |       25      |      125      |
-----------------------------------------------

Test Run 2
(provide your own test input data)

Test Run 3
(provide your own test input data)
```

<u>Use for loops for questions 9 to 10</u>

Notes: you may use `unsigned int` to declare the loop variable i .

9. Write a program to print the following pattern. Ask the user to input the base size (you may need two for loops)

Sample Test Run

```
Test Run 1
Enter base size of triangle for pattern : 5

1
12
123
1234
12345

Test Run 2
(provide your own test input data)
```

```
Test Run 3
(provide your own test input data)
```

10. Write a program to print the following pattern. Ask user to input the highest uppercase alphabet.

    Sample Test Run

```
Test Run 1
Enter highest alphabet : F
A
AB
ABC
ABCD
ABCDE
ABCDEF

Test Run 2
(provide your own test input data)

Test Run 3
(provide your own test input data)
```