CSc10300 - Assignment 1

Introduction to C++, Variables/Assignments

Spring 2021

Submission:

1

Write a C++ program that:

(a) declares a variable X for storing a floating point number and initializes it with zero.

(b) asks the user to input a floating point number with 6 digits : 3 digits in whole number part and 3 digits in decimal part.

(c) read user-input value and store it in X.

(d) print digits in different positions of the X (hundreds, tens, ones, tenths, hundredths and thousandths) in the format shown in the sample output. Use tabs and newlines to mimic the format.

(e) round user-input value stored in X and store the result it in X.

(f) print out the rounded value.

Sample Output

```
Input a floating-point number with 6 digits
(3 in whole number part and 3 in decimal part i.e. XXX.XXX)
456.789

The decimal part:
    thousandths: 9
    hundredths: 8
    tenths: 7
The whole number part:
    ones : 6
    tens : 5
    hundreds : 4

Rounded value : 457
```

2

Write a C++ program that:

(a) uses your studentID as a seed for rand() function.

(b) generates a random floating-point number with 4 decimal points between -10 and -9 e.g. -9.5427 and store it a variable. The interval does NOT include -9 and -10 i.e. (-10,-9).

(c) print the generated random value.

(d) print the absolute value, ceiling and floor of the generated random value.

(e) print the decimal part of the generated random value.

Sample Output

```
Random number : -9.7823
Absolute value: 9.7823
Its floor : -10
Its ceiling: -9
Its decimal part: 7823
```

3

Write a C++ program that accept 4 positive real numbers and compute the difference between the highest number and the lowest number. All input numbers should be real numbers between 0 and 1,000,000.

Note that you are not allowed to use if-else.

Sample Output

```
Input for real numbers between 0 and 1,000,000.
6739
2.4774
999903.99
56382.00001
Difference between the highest and lowest number: 999901.5126
```

4

Write a C++ program that:

(a) calculates the volume and area of a cylinder using following formulas:

$$Volume = \pi r^2 h$$

$$Area = 2\pi rh + 2\pi r^2$$

where r and h are floating-point numbers represents the radius and height of a cylinder respectively.

(b) create variables area and volume and store the results in them.

(c) output the results with two digit after the decimal point using the format shown the sample output.

(d) use pow function for calculate powers.

Sample Output

```
Input radius and height of the cylinder in inches:
5.2 8.1
Volume: 688.08 cubic inches
Surface area: 434.55 square inches
```