CS 115 - Introduction to Programming in Python

Lab 01

Lab Objectives: Input/output, data, expressions, branching

1. Write a Python program that inputs a, b and c for an equation $ax^2 + bx + c$ and find the two roots using the equation below. Note: discriminant ($b^2 – 4ac$) must be positive to find the roots. If the discriminant is negative the program should display an appropriate message.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sample Run:

```
Enter the coefficient of x2: 1
Enter the coefficient of x: 4
Enter the constant term: -7
Roots are: -5.32 1.32

Enter the coefficient of x2: 1
Enter the coefficient of x: 3
Enter the constant term: 5
No real roots
```

2. Write a program that prompts the user to enter three integers and displays them in ascending (non-decreasing) order.

Sample Run 1:

```
Enter the first integer: 58
Enter the second integer: -27
Enter the third integer: -27
The sorted nums are -27 -27 58
```

3. Write a program that converts digital storage units. First the user will enter the input digital storage unit, then the digital storage value, and lastly the unit that the value will be converted to.

Note: Your program should validate the input.

Unit Conversion Table	
1 byte	8 bits
1 kilobyte	1024 bytes

Sample Run 1:

```
   Enter a positive integer value: 100

   Enter the unit of the value (bit/byte/kilobyte): kilobyte

   What unit do you want (bit/byte/kilobyte): bit
   100 kilobyte is equal to 819200 bit
```

Sample Run 2:

```
Enter a positive integer value: -50
   Units must be positive
```

Sample Run 3:

```
Enter a positive integer value: 400

   Enter the unit of the value (bit/byte/kilobyte): bits
   Invalid Unit
```

Sample Run 4:

```
   Enter a positive integer value: 1000

   Enter the unit of the value (bit/byte/kilobyte): byte

   What unit do you want (bit/byte/kilobyte): kilobytes
   Invalid conversion unit
```

Sample Run 5:

```
   Enter a positive integer value: 1000

   Enter the unit of the value (bit/byte/kilobyte): byte

   What unit do you want (bit/byte/kilobyte): kilobyte
   1000 byte is equal to 0.9765625 kilobyte
```