IT 166 Lab 2

Python core data types

Objectives

- Be able to write Python programs that solve simple math problems.
- Be able to write Python statements that involve the usage of Python core data types.
- Be able to write Python statements that display information properly.

Preparation

- Launch the Jupyter notebook.
- Rename the notebook page as “lab2”.

Please provide solutions to the problems below.

Problem 1

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

Given the above formula that computes the roots of a quadratic equation: $ax^2 + bx + c = 0$

Please write a Python program that will find and display the roots of the equation: $3.5x^2 + 20x = 10$.

The expected outcome for display is:

```
<root1> and <root2>
```

In order to display the roots nicely, we will only keep two significant digits for their decimal places. To do this, you will need to use Python’s built-in function, round. For example, round(3.14159, 2) will give you 3.14

To compute the square root, you will need to import Python’s math library. Below is an example to compute and display the square root of 3 using the library:

```
import math

print(math.sqrt(3))
```

Problem 2

Write the Python program that determines the change to be dispensed from a vending machine. An item in the machine can cost between 25 cents and a dollar, in 5-cent increments (25, 30, 35, . . . 90, 95, or 100), and the machine accepts only a single dollar bill to pay for the item. Save the change information to a dictionary called changes. Use "quarter", "dime", and "nickel" as the keys, and the values shall be the change information.

For example, the expected outcome might be:

```
Enter the price of an item: 45 You bought an item for 5 cents and gave me a dollar, so your change is 2-quarter, 0-dime, and 1-nickel. The dictionary is: {'quarter': 2, 'dime': 0, 'nickel': 1}
```

- Hint: You need to use the input function to display the screen prompt and take the input from keyboard. E.x.: price = input("`Enter the price of an item: `")
- However, the price information is saved as a string, so you need to typecast it into a number (integer) before the computations.

Problem 3

Create a Python list named information_list. Save information below into the list by following their sequences:

1) Your first name as a string.
2) Your last name as a string.
3) Your age as an integer.
4) A list of course IDs that you are attending this semester.

Display a summary of yourself based on the information inside the list (This means you need to retrieve the information from the list). An expected outcome is:

```
Name:  Xing Fang
Age:  32
Courses attending this semester:  IT 166, IT 168, and IT 170
```