Introduction to programming – ASSIGNMENTS 1

General instructions:

- Type in and test your programs using Python Idle.
- Bring in your answers to the next assignment (i.e. demonstration) session in memory stick, or save them to a web folder accessible in class. Alternatively, you can bring written answers with you, though this is not recommended.
- Remember to comment your code – this does NOT mean, that every single line should be commented. Comment the important parts in your program.
- Prepare to present your solution to the class.

1. Consider the following program:

```
a = 3
b = 6
c = 7
```

   Complete the program by adding two new variables: **`sum`** and **`average`**; calculate the sum of `a`, `b` and `c` to **`sum`** and the average of `a`, `b` and `c` to **`average`**. Finally, output the values of the variables **`sum`** and **`average`**.

2. Write a program that queries the user for a name, and outputs a message “Hello there, name”.

   Example execution:

```
What is your name? John Smith

Hello there, John Smith
```

3. Write a program that queries the user for a temperature in Celsius, and then outputs the temperature in Fahrenheit. The formula for converting temperature to Fahrenheit is

$$\frac{9.0}{5} * tempInCelsius + 32$$

Example execution:

```
Give a temperature in Celsius : 25

25 degrees Celsius is 77 degrees Fahrenheit.
```

4. Write a program that queries users name and year of birth, and then outputs the string displaying users name and age in 2010 (within a 1 year limit).

Example execution:

```
Give your name : John Smith

Which year you were born: 1980

Hello, John Smith. You are 30 years in 2010.
```

5. Write a program that queries a string and an integer, and then outputs the string repeated the given number of times.

Example execution:

```
Give a string: abc
Give a number: 3
abcabcabc
```

6. *** Expert assignment* (double points):

Write a program that queries the user for values a, b and c and solves the roots of a quadratic equation

$$ax^2 + bx + c = 0$$

The roots can be solved by the *quadratic formula:*

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

Note, that the two roots have to be calculated separately.

You need to use the Python function **sqrt(x)** which returns the square root of x. To use the function, you must insert the following line as a first line in your program:

```
from math import sqrt
```

Example of a program using the square root functions in Python:

```
from math import sqrt
myNumber = 49
root = sqrt(myNumber) # square root of 49 is 7
print root
```

Example execution:

```
Give a: 1
Give b: 2
Give c: -8

The roots are 2 and -4
```

NOTE!
Your program doesn't need to solve equations with imaginary roots; hence the program that solves the equation with following input values is acceptable:

```
a: 1, b: 2, c: -8
a: 2, b: 5, c: 3
a: 1, b: -3, c: 0
```