

# 582332: Programming in Python, Fall 2009

Exercise sheet 2  
14-18.9.2009

Note: 8 questions in total.

1. Suppose we have three strings: "Hello", "again", and "world". Create their concatenation string with the + operator.

Then write the following expression in Python: length of the concatenation equals the sum of lengths of original strings. The result type of the expression should be `bool` and the value should be `True`.

Use the builtin function `len` to get the length of a string.

2. Give a Python statement that prints the string  
"Don't go!", she said.
  - (a) using backslashes
  - (b) by not using backslashes at all.

3. In mathematics, the quadratic equation

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

can be solved with the formula

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

Write a Python expression that gives one of the two solutions to the equation

$$1x^2 - 3x + 2 = 0.$$

*Hint. Import `sqrt` function from `math` module.*

4. Write a function `solve_quadratic`, that returns both solutions of a generic quadratic as a pair when the coefficients are given as parameters. It should work like this:

```
>>> solve_quadratic(1,-3,2)
(1,2)
>>> solve_quadratic(1,2,1)
(-1,-1)
```

5. Let us consider throwing two dice. (A dice can give a value between 1 and 6.) Use two nested `for` loops to iterate through all possible combinations the pair of dice can give. There are 36 possible combinations. Print all those combinations as pairs that sum to 5. For example, your printout should include the pair (2,3).

6. Write two functions: `triple` and `square`. Function `triple` multiplies its parameter by three. Function `square` raises its parameter to the power of two. For example, we have equalities `triple(5)==15` and `square(5)==25`.

Write a `for` loop that iterates through values 1 to 10, and for each value prints its triple and its square.

Now modify this `for` loop so that it stops iteration when the square of a value is larger than the triple of the value.

7. Write a function `do_shopping` that prints “shopping instructions” for the maid when given a shopping list.

The shopping instructions consists of four parts:

- It starts with the string "Go to the shop.", even for an empty list
- Then for each item in the list it prints Buy *item*.
- Then the string "Pay for the *n* purchases." follows, where *n* is the length of the list.
- Then the instructions ends with string "Return home."

It should work like this:

```
>>> do_shopping(['Potatoes','Carrots', 'Milk'])
Go to the shop.
Buy Potatoes.
Buy Carrots.
Buy Milk.
Pay for the 3 purchases.
Return home.
```

8. Normally, when we need to do repetitive tasks, we can choose between `for` and `while` loops. Is it redundant to have two constructs for this same job? Give an example of a case when using `while` loop is simpler than using a `for` loop.