Week 3: Variables and arithmetic operators

Programming

2021 - 2022

Bachelor in Computer Science and Engineering

Exercise 1. Variable declaration

Declare a variable for each of the data types we know and print their values. What is the name of the Python property that allows using a variable without declaring its type?

Exercise 2. Using non-initialized variables

Declare a variable of any type, but do not initialize it (do not give an initial value to it). What is the result? Why?

Exercise 3. Changing the value of a variable

Declare and initialize a variable. Next, in a new sentence, change the value of the variable. Is it possible? Does the type of the variable make any difference? Print both the initial and the new values on the screen.

Exercise 4. Changing the type of a variable

Declare and initialize an integer variable. In the next line change its content so now it stores 'hello'. Is that possible? What is the name of the Python property allowing it?

Exercise 5. Float precision

Declare two `float` variables. Initialize the first variable with the value `12345678901234567.0` and the second one with the value `12345678901234568.0`. Print the subtraction of them on the screen. What is the result? Repeat the same procedure with two `int` variables (remove the decimal). What is the result? Why? Print the result of the following operation: `0.3 - 0.2`, what happens?

Exercise 6. Multiple declarations

Declare and initialize in a single line three variables of different types. Is that possible?

Exercise 7. Copy of variables

Create two variables of any type, assign a value to the first one, and assign the first one to the second one. Print on the screen the second variable. Extend the program with a new instruction that changes the value of the first variable, and add another instruction to print again the second one. Does the second variable change its value? Why?

Exercise 8. Division by zero

Declare three `int` variables. Assign 5 to the first one and 0 to the second one. Assign to the third variable the result of dividing the first variable by the second one. Print the result on the screen. Is there any error? Why? Does the result change if the variables are declared as float?

Exercise 9. String concatenation

Declare three `string` variables. Assign any value to the first two variables and make the third one equal to the first one + second one. Print the third variable. What happens? What happens if you make third = first – second?

Exercise 10. Multiple line strings

Write a Python program to store into a variable the string: `Twinkle, twinkle, little star, how I wonder what you are! Up above the world so high, like a diamond in the sky. Twinkle,`

`twinkle, little star, how I wonder what you are.` It must be stored in a way that when printing it we obtain the following specific format:

```
Twinkle, twinkle, little star,
      how I wonder what you are!
            Up above the world so high,
            like a diamond in the sky.
Twinkle, twinkle, little star,
      how I wonder what you are.
```

Exercise 11. Slicing strings

Using the previously declared variable and the String slicing operators create three variables, the first one will contain `Twinkle, twinkle, little star`, the second one `Up above the world so high` and the third one `how I wonder what you are`. Print them.

Exercise 12. Printing with format

Copy the following program:

```
name = 'Johnny Depp'
age = 55
height = 1.78
weight = 65.4
eyes = 'brown'
hair = 'brown'
print("Let's talk about %s." %name)
print("He's %i years old" %age)
print("He's %.2f meters tall." %height)
print("He's %.0f kilograms heavy." %weight)
print("Actually that's not too heavy.")
print("He has %s eyes and %s hair." % (eyes, hair))
```

Execute it and check that you get the following outcome:

```
Let's talk about Johnny Depp.
He's 178 centimeters tall.
He's 65.400000 kilograms heavy.
Actually that's not too heavy.
He's got Brown eyes and Brown hair.
```

In class, we saw a different use of the print function; that is, `print("Let's talk about", name)`. Copy the same program, but rewrite the print functions using the format that we saw in class. Is there any difference in the outcome between the two ways?

Exercise 13. Out of range operations

Create a float variable with a value out of range by multiplying to big numbers. What is the result? Now generate the out of range number by using power operator (**). What is the result?

Delivery rules

The solutions to the previous exercises must be uploaded to Aula Global before 29th September 2021, 08:00 am. Upload a zip file containing a file for each exercise (name them exercise1.py, exercise2.py, etc). The name of the zip file must be "w3-name-initials.zip" (Lucía Pérez Gómez will name the file w3-lpg.zip).