Script Programming 2

Introduction to Python

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Week I

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Who's me?

- Master student of Advanced AI & Intelligent Systems at FINKI Sc.Cyril and Methodius
- Graduated from FINKI, Sc.Cyril and Methodius "Software engineering and information systems"

- Machine Learning Engineer - Laigo GmbH
- Data Engineer - Loka
- Digital analyst - Freelance

Tools

Introduction

1. Introduction to Python: Python is a high-level programming language that is widely used for web development, data analysis, artificial intelligence, and many other applications. It is known for its simplicity, readability, and flexibility.
2. Python Basics: Entering Expressions into the Interactive Shell: The Python Interactive Shell is a command-line interface where you can enter Python code and see the results immediately. You can use it to test small snippets of code and experiment with different expressions.

Example

```
>>> 2 + 3
5
>>> 4 * 5
20
>>> 10 / 3
3.3333333333333335
```

Example

Python has several built-in data types, including integers, floating-point numbers, and strings. Integers are whole numbers, while floating-point numbers have decimal points. Strings are sequences of characters.

```
# Integers
x = 5
y = 10
z = -3

# Floating-point numbers
a = 2.5
b = 3.14159

# Strings
name = "Alice"
message = 'Hello, world!'
```

Example

String Concatenation and Replication: You can use the + operator to concatenate two strings and the * operator to replicate a string a certain number of times.

```
# String concatenation
greeting = "Hello"
name = "Alice"
message = greeting + ", " + name + "!"
print(message) # Output: Hello, Alice!

# String replication
symbol = "-"
line = symbol * 10
print(line) # Output: ----------
```

Example

Storing Values in Variables: You can store values in variables so that you can use them later in your code. Variables are like containers that hold a value.

```
# Storing integers in variables
x = 5
y = 10
z = x + y
print(z) # Output: 15

# Storing strings in variables
name = "Alice"
greeting = "Hello, " + name + "!"
print(greeting) # Output: Hello, Alice!
```

Problems to solve

- Introduction to Python:
- Create a variable my_name and assign your name to it.
- Calculate the area of a rectangle with width 4 and height 6 and store the result in a variable named area.
- Write a Python program that asks the user for their name and age, and then prints out a message that says "Hello, [name]! You are [age] years old."
- Python Basics: Entering Expressions into the Interactive Shell:
- Calculate the value of (5 * 2) - 3 and print the result.
- Calculate the value of 2 ** 3 (i.e., 2 raised to the power of 3) and print the result.
- Calculate the value of 10 / 3 and round the result to 2 decimal places.
- The Integer, Floating-Point, and String Data Types:
- Create a variable my_age and assign your age to it as an integer.
- Create a variable pi and assign the value of pi (i.e., 3.14159) to it as a floating-point number.
- Create a variable my_name and assign your name to it as a string. Then, print out a message that says "My name is [name]."
- String Concatenation and Replication:

Problems to solve

- Create two variables first_name and last_name and assign your first and last name to them as strings. Then, use string concatenation to create a message that says "My name is [first name] [last name]."
- Create a variable symbol and assign a symbol of your choice to it as a string. Then, use string replication to create a line of 10 symbols.
- Create a variable text and assign a sentence of your choice to it as a string. Then, use string replication and concatenation to create a message that repeats the sentence 3 times, separated by a symbol of your choice.
- Storing Values in Variables:
- Create a variable width and assign the value 4 to it as an integer. Then, create a variable height and assign the value 6 to it as an integer. Finally, calculate the area of a rectangle with those dimensions and print the result.
- Create a variable name and assign your name to it as a string. Then, use string concatenation to create a message that says "Hello, [name]!"
- Create a variable x and assign the value 3 to it as an integer. Then, create a variable y and assign the value 4 to it as an integer. Finally, calculate the value of x ** 2 + y ** 2 and print the result.

Problem 1

- Write a Python program that asks the user to enter two numbers, and then prints out the sum, difference, product, and quotient of those numbers.
- Write a Python program that asks the user to enter their age, and then prints out a message that says "You are [age] years old. In 10 years, you will be [age + 10] years old."

Problem 2

- Write a Python expression that calculates the sum of the first 1000 positive integers.
- Write a Python expression that calculates the product of the first 10 prime numbers.
- Write a Python expression that calculates the value of (1 + sqrt(5)) / 2, where sqrt is the square root function.

Problem 3

- Write a Python program that asks the user to enter two integers, and then prints out the sum, difference, product, and quotient of those numbers.
- Write a Python program that asks the user to enter the radius of a circle, and then prints out the area and circumference of the circle.
- Write a Python program that asks the user to enter a sentence, and then prints out the number of vowels and consonants in the sentence.

Problem 4

- Write a Python program that generates a random password consisting of 8 characters, where each character is either a lowercase letter or a digit.
- Write a Python program that asks the user to enter a sentence, and then prints out the sentence in reverse order.
- Write a Python program that asks the user to enter a sentence, and then prints out the sentence in alternating case (i.e., uppercase, lowercase, uppercase, etc.).

Problem 5

- Write a Python program that asks the user to enter the lengths of the sides of a triangle, and then calculates and prints out the area of the triangle.
- Write a Python program that simulates the rolling of two six-sided dice and prints out the sum of the two numbers.
- Write a Python program that asks the user to enter a string, and then checks whether the string is a palindrome (i.e., the same forwards and backwards).

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Questions?

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