Programming with Python (2ed)

Lecturer: Gianluigi Pertusi

Language

English

Course description and objectives

The course aims at providing students with the basic elements of the programming language Python and its applicative domains: artificial intelligence, multimedia and games, automation, scripting, graphical user interfaces, networking, machine learning, etc.

Students will acquire all the basic concepts about the programming process with Python, how to use data structures, and how to import external libraries.

Specifically, at the end of the course, students will be able to:

- Implement simple algorithms
- Select and use external Python libraries and functions to develop real software projects

Audience

The course is open exclusively to students of the Master of Science Programs at Bocconi University and is part of the Curricular Integrative Activities that are worth 2 credits (subject to 75% attendance and to passing the final test).

Prerequisites

It is useful to know, at least in general, the logic of computer programming.

Duration

24 hours

Calendar

Lecture	Date	Time	Room
1	Wed 05/02/2020	18.00 - 19.30	InfoU01
2	Thu 06/02/2020	18.00 - 19.30	InfoU01
3	Wed 12/02/2020	18.00 - 19.30	InfoU01
4	Wed 19/02/2020	18.00 - 19.30	InfoU01
5	Mon 24/02/2020	18.00 - 19.30	InfoU01
6	Tue 25/02/2020	18.00 - 19.30	InfoU01
7	Wed 26/02/2020	18.00 - 19.30	InfoU01
8	Mon 02/03/2020	18.00 - 19.30	InfoU01
9	Tue 03/03/2020	18.00 - 19.30	InfoU01
10	Wed 04/03/2020	18.00 - 19.30	InfoU01
11	Mon 09/03/2020	18.00 - 19.30	InfoU01
12	Wed 11/03/2020	18.00 - 19.30	InfoU01

Syllabus of the course

Lesson	Topics	Bibliography

1	**Introduction to Python**
	- Short Introduction to the language
	- Why to use version 3 and how to install it
	- IDLE and other development interfaces (Anaconda, PowerShell, ...)
	- Execution modes
	  ○ From the shell
	  ○ From the editor
	- Where to find support: comments, online help, documentation, community
	Exercises
		Chap. 1, 2.1-2.7, 2.9

Lesson	Topics	Bibliography
2	**Variables and elementary data types** - Variables as memory references - Variables creation and update with the assignment instruction - Numeric types and string type - Introduction to modules (libraries) and built-in functions - Calculations and execution priorities - Input and output - Conversion of data types ***Exercises***	**Chap. 2.8, 3, 4**
3	**Programming – part 1: conditional constructs and errors** - Simple and nested *if* (*elif*) - Logical operators (*and*, *or*, *not*) - Conditional operators - Types of errors - Debug and test of a program - Error handling: *try* and *except* ***Exercises***	**Chap. 5, 10.4-10.6**
4	**Programming – part 2: iterative constructs** - *for* and *while* loops - Nested cycles - Forced exit from cycles: *break* and *continue* instructions - How to nest different types of structures ***Exercises***	**Chap. 6**
5	**Programming – part 3: functions** - Defining a function - Input parameters: mandatory and optional arguments - Output: productive and empty functions - Recursive functions ***Exercises***	**Chap. 7**

Lesson	Topics	Bibliography
6	**Complex data structures – part 1: what they are** - Structures taxonomy - Strings, tuples and lists: indexing and slicing - Dictionaries: keys and values - How to create, edit, delete elements in a data structure ***Exercises***	**Chap. 8.1-8.7, 8.11 8.12, 9.1, 9.3, 9.4**
7	**Complex data structures – part 2: how to interact** - Strings: methods and functions - Tuples: methods and functions - Lists: methods and functions - Dictionaries: methods and functions ***Exercises***	**Chap. 8.8-8.10, 9.2, 9.5**
8	**Complex data structures – part 3: custom classes** - The concept of class and instance - Attributes and methods - Inheritance - Overloading and overriding ***Exercises***	**Chap. 12**
9	**Working with the standard library modules** - Use of the standard library - Examples of standard library modules ***Exercises***	**Chap. 11.1, 11.2**
10	**Working with modules of third-party libraries** - Search, installation and use of external modules - Read and write text files - Read and write Excel files ***Exercises***	**Chap. 10.1-10.3, 11.3-11.5**
11	**Summary Exercise**	
12	**Q&A** **Final test (mandatory)**	

Software

Python 3.x with IDLE

Suggested bibliography

Clerici A., De Pra M., Debernardi C., Tosi D., *Learning Python*, Egea, 2019

Reference web links:

- Official site: https://www.python.org/
- Official documentation: https://docs.python.org/3/
- Repository of official external modules: https://pypi.org/

Available seats

This activity is limited to **100** participants and reserved to **students of the Master of Science Programs**. Registrations cannot be carried out once this number has been reached or after closing of the registration period.