



Introduction to Python

55284

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About this course

In this 4-day Python training course, students learn to program in Python. The course is aimed at students new to the language who may or may not have experience with other programming languages.

This Python course is taught using Python 3; however, differences between Python 2 and Python 3 are noted. For private Python classes, our instructor can focus specifically on Python 2 if desired.

Students Profile

This course is intended for students who want to learn Python. Some programming experience is helpful but not required.

At Course completion

- Understand how Python works and what it's good for.
- Understand Python's place in the world of programming languages.
- Work with and manipulate strings in Python.
- Perform math operations with Python.
- Work with Python sequences: lists, arrays, dictionaries, and sets.
- Collect user input and output results.
- Perform flow control processing in Python.
- Write to and read from files using Python.
- Write functions in Python.
- Handle exceptions in Python.
- Work with dates and times in Python

Module 1: Python Basics

Python, which first appeared in 1991, is one of the most popular programming languages in use. Python is a high-level programming language, meaning that it uses a syntax that is relatively human readable, which gets translated by a Python Interpreter into a language your computer can understand. Examples of other popular high-level programming languages are C#, Objective-C, Java, PHP, and JavaScript.

Interestingly, all of these other languages, unlike Python, share a C-like syntax. If you use one or more of those languages, you may find Python's syntax a little strange. But give it a little time. You'll find it's quite programmer friendly.

Lessons

Running Python

- Hello, World!
- Literals
- Python Comments
- Variables
- WRiting a Python Module
- print() Function
- Collecting User Input
- Getting Help

Lab 1: Exercises in this Lesson

- Hello, World
- Exploring Types
- A Simple Python Script

After completing this module, students will be able to:

- Understand how Python works.
- Understand Python's place in the world of programming languages.
- Understand the difference between Python 3.x and Python 2.x.
- Understand variables and Python's data types.
- Create simple modules.
- Get help on Python.

Module 2: Functions and Modules

This module explains how to work with functions and modules.

Lessons

- Defining Functions
- Variable Scope
- Global Variables
- Function Parameters
- Returning Values
- Importing Modules

Lab 1: Exercises in this Lesson

- A Function with Parameters
 - Parameters with Default Values
- After completing this module, students will be able to:
- Define and call functions.
 - Define parameters in and pass arguments to functions.
 - Set default values for parameters.
 - Understand variable scope.
 - Return values from functions.
 - Create and import modules.

Module 3: Math

Python includes some built-in math functions and some additional built-in libraries that provide extended math (and related) functionality. In this lesson, we'll cover the built-in functions and the math and random libraries.

Lessons

- Arithmetic Operators
- Assignment Operators
- Built-in Math Functions
- The math Module
- The random Module

Lab 1: Exercises in this Lesson

- Floor and Modulus
- How Many Pizzas Do We Need

After completing this module, students will be able to:

- Do basic math in Python.
- Use the math module for additional math operations.
- Use the random module to generate random numbers.

Module 4: Python Strings

According to the Python documentation, "Strings are immutable sequences of Unicode code points." Less technically speaking, strings are sequences of characters¹⁵. The term sequence in Python refers to an ordered set. Other common sequence types are lists, tuples, and ranges, all of which will be covered later in this course.

Lessons

- Quotation Marks and Special Characters
- String Indexing
- Slicing Strings
- Concatenation and Repetition
- Common String Methods
- String Formatting
- Formatted String Literals (f-strings)
- Built-in String Functions

Lab 1: Exercises in this Lesson

- Indexing Strings
- Slicing Strings
- Repetition
- Playing with Formatting
- Getting Acquainted with f-strings
- Outputting Tab-delimited Text

After completing this module, students will be able to:

- Work with strings.
- Escape special characters.
- Work with multi-line strings.
- Index and slice strings.

Use common string operators and methods.

- Format strings.
- Use built-in string functions

Module 5: Iterables: Sequences, Dictionaries, and Sets

Iterables are objects that can return their members one at a time. The iterables we will cover in this lesson are lists, tuples, ranges, dictionaries, and sets.

Lessons

- Definitions
- Sequences
- Unpacking Sequences
- Dictionaries
- The len() Function
- Sets
- *args and **kwargs

Lab 1: Exercises in this Lesson

- Remove and Return Random Element
- Simple Rock, Paper, Scissors Game
- Slicing Sequences
- Creating a Dictionary from User Input

After completing this module, students will be able to:

- Understand the different types of iterables available in Python.
- Create, modify, and work with lists.
- Create and work with tuples.
- Create ranges.
- Create, modify, and work with dictionaries.
- Create sets and to use sets to remove duplicates in lists.
- Understand the *args and **kwargs parameters.

Module 7: Virtual Environments

A virtual environment is a container for a Python development platform on your computer. Packages can be installed in the virtual environment that are separate from your standard, or non-virtual environment.

Lessons

- Virtual Environment
- Lab 1: Exercises in this Lesson
- Working with a Virtual Environment

After completing this module, students will be able to:

- Understand what a virtual environment is.
- Create a virtual environment.
- Activate and deactivate a virtual environment.
- Delete a virtual environment.

Module 8: Regular Expressions

Regular expressions are used to do pattern matching in many programming languages, including, Java, PHP, JavaScript, C, C++, and Perl. We will provide a brief introduction to regular expressions and then we'll show you how to work with them in Python.

Lessons

- Regular Expression Syntax
- Python's Handling of Regular Expressions

Lab 1: None

- None
- After completing this module, students will be able to:
- Create regular expressions for pattern matching.
 - Use regular expressions within Python.

Module 9: Unicode and Encoding

This module explains how to work with Unicode and Encoding.

Lessons

- Bits and Bytes
- Hexadecimal Numbers
- Encoding

Lab 1: Exercises in this Lesson

- Converting Numbers between Number Systems
- Finding Confusables

After completing this module, students will be able to:

- Understand binary and hexadecimal numbers.
- Convert numbers between number systems.

Module 10: File Processing

Python allows you to access and modify files and directories on the operating system.

Among other things, you can:

1. Open new or existing files and store them in file object variables.
2. Read file contents, all at once or line by line.
3. Append to file contents.
4. Overwrite file contents.
5. List directory contents.
6. Rename files and directories.

Lessons

- Opening Files
 - The os and os.path Modules
- Lab 1: Exercises in this Lesson
- Finding Text in a File
 - Writing to Files
 - List Creator

After completing this module, students will be able to:

- Read files on the operating system.
- Create and write to files on the operating system.
- Access and work with directories on the operating system.
- Work with the os and os.path modules.

Module 11: Exception Handling

This module explains how to handle exceptions in Python.

Lessons

- Wildcard except Clauses
- Getting Information on Exceptions
- The else Clause
- The finally Clause
- Using Exceptions for Flow Control
- Raising Your Own Exceptions
- Exception Hierarchy

Lab 1: Exercises in this Lesson

- Raising Exceptions
- Running Sum

After completing this module, students will be able to:

- Handle exceptions in Python.

Module 12: Python Dates and Times

This module explains how to work with Python dates and times.

Lessons

- Understanding Time
- The time Module
- The datetime Module

Lab 1: Exercises in this Lesson

- Report on Amtrack Departure Times

After completing this module, students will be able to:

- Work with the time module.
- Work with the datetime module.

Module 13: Running Python Scripts from the Command Line

This module explains how to run Python scripts from the command line.

Lessons

- sys.argv
- sys.path

Lab 1: None

- None

After completing this module, students will be able to:

- Run Python scripts from the command line.

Requisites

Some programming experience is helpful, but not required.