200 PYTHON EXERCISES

An Introduction to Python

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200 Python Exercises: An Introduction to Python

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Contents

Chapter 1: Python

Start with Python, run that code!

This chapter will be about getting started with Python. We will begin by explaining how to run Python code online, then move on to how to get Python running on your system. At the end of this chapter, you should be able to run Python code.

Run Python Online

If you go to the website https://repl.it/languages/Python3 you can run Python 3 in an online interface. So on the leftside you'll see you can have more than one file. By default is shows the main.py file. Every

Python script ends with the .py extension.

Then you have an editor here where you can type your code. This is where you write all your Python code.

Then on the right side you have a terminal, which shows the output of your program.

Python programs don't run by themselves, you have to click the run button. That's the big green button above the code.

Some other sites to run Python code online are:

- https://www.onlinegdb.com/online_python_compiler
- https://rextester.com/l/python3_online_compiler
- https://skulpt.org/

First programs

Python programs are executed top down. It starts at the the top of the file, then steps down. In other words, it's executed line by line. Every line is called an instruction or statement. Every Python file ends with .py, just like pdf files have a .pdf extension.

Unlike other programming languages that require many lines for simple programs, Python code can be quite compact. You can try this (one line) program:

```python
1  print("Hello World")
```

Click run and you'll see the output on the right. That's right, it shows the message "Hello world".

That's it, you made your first program!

Anything you type between the quotes will be shown on the screen. That can be a word, a sentence, a paragraph or a whole book. You can use a double quote " or a single quote '.

Wondering why the function is named print?

It's named print for historic reasons. Back when programming languages were first designed, there were no screens and program output was printed on paper.

You can show multiple messages on the screen. To do so, change the program into this:

```
1  print("Hello World")
2  print("I am learning Python")
3  print("Bye bye")
```

This works for variables too. For example, you can set a variable to 3 and output that variable.

```
1  x = 3
2  print(x)
```

You can display a variable as many times as you want.

```
1  x = 3
2  print(x)
3  print(x)
```

Variables can change value during the program.

```
1  x = 3
2  print(x)
3  x = 4
4  print(x)
```

That's why we see 3 and 4 in the output.

So this is how Python programs are executed, top down. You've seen how to use the print function, which can output text and variables.

Fact: Python programs are always executed top down. It may jump around using function calls or loops, but the order is top down.

If you want to add an extra newline, you can use the special character backslash \n. Like this:

```
1  print("Hello\n")
2  print("World\n")
```

The backslash n character (it shows as two characters, but it's a single newline character) creates a new line.

The are other special character like which displays a tab and ' which displays a quote.

Run Python locally

Notice: Running locally is optional, all code can be executed online.

On many Linux systems, Python is installed by default. On Windows or Mac you need to install it. This is only if you want to run Python locally.

If you want to install Python locally, go to https://www.python.org/
Then download the version for Windows or Mac and install it. Run the installer.

Then in the command line you can type "python" to open the Python interpreter.

To see which version you have installed type

```
1  python --version
```

It's recommended to use Python 3.0 or newer.

To run a Python script type

```
1  python example.py
```

If you run Python locally, you should add this on top of the file:

```
1  #!/usr/bin/python3
```

This lets your computer know where Python is located.

You can write your python programs in any text editor you want (yes even notepad). But I recommend going with an IDE (see below) because it makes softare development much easier.

IDE

You do not have to code from the command line. There are intergrated desktop environments (IDEs). These are tools software developers use when making software.

Some popular IDEs are:

• PyCharm
• Visual Studio Code
• Spyder IDE
• Wing Personal

An IDE lets you start a Python project, has syntax highlighting, numbering, tabs, debugging and many other features that make your life as software developer much easier.

Summary

You should be able to run Python code. Python can be run both online and locally (on your system).

Every Python file ends with the .py extension. Programs are executed top-down and you can output text or variables with the print function.

Exercises

1. Can you run Python online?
2. Can you run Python offline? (on your computer)
3. What is the most recent version of Python?
4. How can you run Python?
5. Which (text) editors can be used to create Python programs?
6. What file extension do Python programs have?
7. Create the "Hello World" program, output "Hello World"
8. Create a program that outputs your name. Make it output your last name on the 2nd line
9. What is the difference between "Hello world" and 'Hello World' ?
10. Create a program that prints a christmas tree.
11. Create a program that prints a rectangle.
12. Create a program that prints a house (in ASCII art style).
13. Create a program that prints your name using the '*' character
14. Define a variable age, and try to output "My age is ... years old"
15. Define a variable name with a value (e.g. Tiffany), and output "Hello Tiffany"
16. Make a program that outputs different currency symbols (dollar, euro etc)
17. Try to output the non-English character epsilon (ε)
18. True or False: Python has only existed from year 2010

19. Can Python programs be run without having Python installed?
20. What file extension is commonly used for Python programs?
21. What is the advantage of Python over C++?
22. What is the advantage of Python over Java?
23. Create a program that calculates 52 + 48
24. Create a program that calculates 30-10
25. Why use an IDE over an text editor like notepad?

Chapter 2: Variables

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Variables

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Define variables

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Variable naming

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Variables in operations

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Conversion

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Concatenate

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User Input

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Chapter 4: Lists, a collection in Python

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Access list items

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Delete items

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Append to list

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List magic

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Dictionaries

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For loop

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Range function

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While Loop

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While else

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While input

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If statements

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Combined if statements

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If else

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If variables

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Chapter 8

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Files

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Write file

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Append to file

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Read file

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Write variables to file

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