

Python from Scratch

Python Variables

Lesson 3

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Python Variables

In Python, variables are created when you assign a value to it:

Example

Variables in Python:

```
x = 5
y = "Hello, World!"
```

Python has no command for declaring a variable.

You will learn more about variables in the Python Variables chapter.

Variables

Variables are containers for storing data values.

Creating Variables

Python has no command for declaring a variable.

- A variable is created the moment you first assign a value to it.

Example

```
x = 5
y = "John"
print(x)
print(y)
```

- Variables do not need to be declared with any particular *type*, and can even change type after they have been set.

Example

```
x = 4          # x is of type int
x = "Sally"    # x is now of type str
print(x)
```

Casting

- If you want to specify the data type of a variable, this can be done with casting.

Example

```
x = str(3)    # x will be '3'
y = int(3)    # y will be 3
z = float(3)  # z will be 3.0
```

Get the Type

You can get the data type of a variable with the `type()` function.

Example

```
x = 5
y = "John"
print(type(x))
print(type(y))
```

Single or Double Quotes?

String variables can be declared either by using single or double quotes:

Example

```
x = "John"
# is the same as
x = 'John'
```

Case-Sensitive

Variable names are case-sensitive.

Example

This will create two variables:

```
a = 4
A = "Sally"
#A will not overwrite a
```

Python Variable Names

A variable can have a short name (like x and y) or a more descriptive name (age, carname, total_volume). Rules for Python variables:

- A variable name must start with a letter or the underscore character
- A variable name cannot start with a number
- A variable name can only contain alpha-numeric characters and underscores (A-z, 0-9, and _)
- Variable names are case-sensitive (age, Age and AGE are three different variables)

Example

Legal variable names:

```
myvar = "John"
my_var = "John"
my_var = "John"
myVar = "John"
MYVAR = "John"
myvar2 = "John"
```

Example

Illegal variable names:

```
2myvar = "John"
```

```
my-var = "John"
```

```
my var = "John"
```

Remember that variable names are case-sensitive

Variable names with more than one word can be difficult to read.

There are several techniques you can use to make them more readable:

- Camel Case
- Pascal Case
- Snake Case

Camel Case

Each word, except the first, starts with a capital letter:

```
myVariableName = "John"
```

Pascal Case

Each word starts with a capital letter:

```
MyVariableName = "John"
```

Snake Case

Each word is separated by an underscore character:

```
my_variable_name = "John"
```

Python Variables - Assign Multiple Values

Many Values to Multiple Variables

Python allows you to assign values to multiple variables in one line:

Example

```
x, y, z = "Orange", "Banana", "Cherry"  
print(x)  
print(y)  
print(z)
```

Note: Make sure the number of variables matches the number of values, or else you will get an error.

One Value to Multiple Variables

And you can assign the *same* value to multiple variables in one line:

Example

```
x = y = z = "Orange"  
print(x)  
print(y)  
print(z)
```

Unpack a Collection

If you have a collection of values in a list, tuple etc. Python allows you to extract the values into variables. This is called *unpacking*.

Example

Unpack a list:

```
fruits = ["apple", "banana", "cherry"]  
x, y, z = fruits  
print(x)  
print(y)  
print(z)
```

Python Output Variables

Output Variables

The Python `print()` function is often used to output variables.

Example

```
x = "Python is awesome"  
print(x)
```

- In the `print()` function, you output multiple variables, separated by a comma:

Example

```
x = "Python"  
y = "is"  
z = "awesome"  
print(x, y, z)
```

- You can also use the `+` operator to output multiple variables:

Example

```
x = "Python "  
y = "is "  
z = "awesome"  
print(x + y + z)
```

Notice the space character after "Python " and "is ", without them the result would be "Pythonisawesome".

- For numbers, the + character works as a mathematical operator:

Example

```
x = 5
y = 10
print(x + y)
```

- In the print() function, when you try to combine a string and a number with the + operator, Python will give you an error:

Example

```
x = 5
y = "John"
print(x + y)
```

- The best way to output multiple variables in the print() function is to separate them with commas, which even support different data types:

Example

```
x = 5
y = "John"
print(x, y)
```


Python - Global Variables

Global Variables

Variables that are created outside of a function (as in all of the examples above) are known as global variables.

Global variables can be used by everyone, both inside of functions and outside.

Example

Create a variable outside of a function, and use it inside the function

```
x = "awesome"

def myfunc():
    print("Python is " + x)

myfunc()
```

- If you create a variable with the same name inside a function, this variable will be local, and can only be used inside the function. The global variable with the same name will remain as it was, global and with the original value.

Example

Create a variable inside a function, with the same name as the global variable

```
x = "awesome"

def myfunc():
    x = "fantastic"
    print("Python is " + x)

myfunc()

print("Python is " + x)
```

The global Keyword

Normally, when you create a variable inside a function, that variable is local, and can only be used inside that function.

To create a global variable inside a function, you can use the global keyword.

Example

If you use the global keyword, the variable belongs to the global scope:

```
def myfunc():  
    global x  
    x = "fantastic"  
  
myfunc()  
  
print("Python is " + x)
```

- Also, use the global keyword if you want to change a global variable inside a function.

Example

To change the value of a global variable inside a function, refer to the variable by using the global keyword:

```
x = "awesome"  
  
def myfunc():  
    global x  
    x = "fantastic"  
  
myfunc()  
  
print("Python is " + x)
```

Python Variable Exercises

Test Yourself With Exercises

Now you have learned a lot about variables, and how to use them in Python.

Are you ready for a test?

Try to insert the missing part to make the code work as expected:

Exercise:

Create a variable named carname and assign the value Volvo to it.

```
 = "
```