**Variable Assignment**

**Rules for variable names**

* names can not start with a number
* names can not contain spaces, use \_ intead
* names can not contain any of these symbols:

:'",<>/?|\!@#%^&\*~-+

* it's considered best practice ([PEP8](https://www.python.org/dev/peps/pep-0008/#function-and-variable-names)) that names are lowercase with underscores
* avoid using Python built-in keywords like list and str
* avoid using the single characters l (lowercase letter el), O (uppercase letter oh) and I (uppercase letter eye) as they can be confused with 1 and 0

**Dynamic Typing**

Python uses *dynamic typing*, meaning you can reassign variables to different data types. This makes Python very flexible in assigning data types; it differs from other languages that are *statically typed*.

In [1]:

my\_dogs = 2

In [2]:

my\_dogs

Out[2]:

2

In [3]:

my\_dogs = ['Sammy', 'Frankie']

In [4]:

my\_dogs

Out[4]:

['Sammy', 'Frankie']

**Pros and Cons of Dynamic Typing**

**Pros of Dynamic Typing**

* very easy to work with
* faster development time

**Cons of Dynamic Typing**

* may result in unexpected bugs!
* you need to be aware of type()

**Assigning Variables**

Variable assignment follows name = object, where a single equals sign = is an *assignment operator*

In [5]:

a = 5

In [6]:

a

Out[6]:

5

Here we assigned the integer object 5 to the variable name a.  
Let's assign a to something else:

In [7]:

a = 10

In [8]:

a

Out[8]:

10

You can now use a in place of the number 10:

In [9]:

a + a

Out[9]:

20

**Reassigning Variables**

Python lets you reassign variables with a reference to the same object.

In [10]:

a = a + 10

In [11]:

a

Out[11]:

20

There's actually a shortcut for this. Python lets you add, subtract, multiply and divide numbers with reassignment using +=, -=, \*=, and /=.

In [12]:

a += 10

In [13]:

a

Out[13]:

30

In [14]:

a \*= 2

In [15]:

a

Out[15]:

60

**Determining variable type with type()**

You can check what type of object is assigned to a variable using Python's built-in type() function. Common data types include:

* **int** (for integer)
* **float**
* **str** (for string)
* **list**
* **tuple**
* **dict** (for dictionary)
* **set**
* **bool** (for Boolean True/False)

In [16]:

type(a)

Out[16]:

int

In [17]:

a = (1,2)

In [18]:

type(a)

Out[18]:

tuple

**Simple Exercise**

This shows how variables make calculations more readable and easier to follow.

In [19]:

my\_income = 100

tax\_rate = 0.1

my\_taxes = my\_income \* tax\_rate

In [20]:

my\_taxes

Out[20]:

10.0

Great! You should now understand the basics of variable assignment and reassignment in Python.  
Up next, we'll learn about strings!