The First Python Program

In [1]:
```
print("Hello World")
```

```
Hello World
```

print() must be lower case.

Printed text can be lower/upper case.

In [2]:
```
print("Hi", "there")
print("one", "two", "three")
```

```
Hi there
one two three
```

print() is a function. It can take several arguments, separated by commas

Code can be hard to read. To make programs clear, we add comments.

"#" adds a comment

Good comments help to explain code.

Expressions

In [3]:
```
print(2+4)
print(10-3*5)
print((10-3)*5 )
```

```
6
-5
35
```

We can use more complex expressions to get python to do calculations for us.

We are not printing text (No quotes "")

Other Math Operations

In [4]:
```
print(min(10,2,3))
print(max(10,2,3))
print(abs(-13))
```

```
2
10
13
```

Python has built-in functions that can perform other operations

Creating Our Own Functions

In [5]:
```
def func_name():
    #statements
    return

func_name()
```

Function name: lower case separated by underscore.

Indentation: 4 spaces or tab.

Parentheses are a must.

After definition takes effect, we can use the function anyware in the code.

In [6]:
```
def myFunc():
    print("*********")
    print("* HELLO *")
    print("*********")
    return

myFunc()
```

```
*********
* HELLO *
*********
```

In [7]:
```
def myAdd(a,b):
    print("The result is", a+b)

myAdd(3,4)
```

```
The result is 7
```

In [8]:
```
a() #ERROR: a() is not defined yet.
def a():
 # not executed until a() called:
 return b() #Okay.
a() #ERROR! Because b() isn't defined.
def b():
 return 1
a() #This is Okay.
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-8-cc18b37599c2> in <module>
----> 1 a() #ERROR: a() is not defined yet.
      2 def a():
      3  # not executed until a() called:
      4  return b() #Okay.
      5 a() #ERROR! Because b() isn't defined.

NameError: name 'a' is not defined
```

Types

type()

Return the type of the variable

In [16]:
```
print(type(3))
print(type(3.0))
print(type(""))
```

```
<class 'int'>
<class 'float'>
<class 'str'>
```

List of Operators

Arithmetic operators: + - * / ** % //

Comparison operators: == != > < >= <=

Logical operators: and or not

In [32]:
```
str(12) #converts the int 12 to string "12"
int(12.5) # converts the float 12.5 to integer 12
float("12.5") #converts the string "12.5" to float 12.5
bool(12) #converts the integer 12 to the Boolean True
```

Out[32]:
```
True
```

Variables

In [34]:
```
x=3
print(x)
```

```
3
```

In [36]:
```
y=2+x
print(y)
```

```
5
```

We can assign values to a variable

=

Expression is evaluated, then the result is assigned. Variable names can be made of letters, digits, "_" (MUST NOT START WITH DIGIT)

Choose meaningfull names!

In [38]:
```
number = 2
print(number)
number = "Hello"
print(number)
```

```
2
Hello
```

Variables can be reassigned (even to different types).

The previous value is gone, replaced by a different one.

In [39]:
```
x = 2
x = x+1
#Makes sense in python, but not in math
```

In [41]:
```
2 + x = 5
#Not legal python syntax, but makes sense in math
```

```
  File "<ipython-input-41-07a104a45917>", line 1
    2 + x = 5
    ^
SyntaxError: cannot assign to operator
```

In [43]:
```
x = 2
y = 2
x = x + 1
print(x,y)
```

```
3 2
```

Input From the User

We can write a program that will accept input from its user, using the function input([prompt]).

This will pause the program and wait for input from the user. The input is returned as a string.

In [45]:
```
name = input("Please enter your name: ")
print("Hello", name)
```

```
Hello Joe
```

Conditional Execution - The if-else Statement

if case1(): do_this() else: do_that()

In [47]:
```
if 5>3: #return True
    print("Yes:5>3")
else:
    print("no: 5<=3")
```

```
Yes:5>3
```

In [49]:
```
VOTING_AGE = 18
age = int(input("Please enter your age: "))

if age < VOTING_AGE:
    print("You are not allowed to vote.")
    c = input("who would you like to vote for, if you could?")
else:
    print("You are a voter.")
    c = input("Who did you vote for?")

print("Your candidate is ", c)
```

```
You are a voter.
```

```
Your candidate is  Trump
```

if age > 18: if country == “Germany”: drink = “beer” elif country == “France”: drink = “wine” elif country == “Russia”: drink = “vodka” else: drink = “water” elif age > 5: drink = “soda” else: drink = “milk”

Functions with Parameters

In [52]:
```
def print_twice(message): #message is a parameter
    """print a message twice"""
    print(message)
    print(message)

s = "Hello"
print_twice(s)
```

```
Hello
Hello
```