Institute for advanced architecture of Catalonia | BARCELONA

COMPUTER PROGRAMMING WITH PYTHON
MASTER PRE-COURSE SERIES
2021/2022

FACULTY DIEGO PAJARITO

Created using the virtual keypunch: https://www.masswerk.at/keypunch/

Punch card

Scripts

The building blocks of Python programs

Natural language:
Karl has 5 apples and Anne has 7 bananas.
Show how many fruits they have.

Java	Python

`int karl_apple = 5;`
`int anne_bananas = 7;`
`Int fruits = karl_apple + anne_bananas;`
`System.out.println(total_fruits);`
	`karl_apple = 5`
	`anne_bananas = 7`
	`fruits = karl_apple + anne_bananas`
	`print (fruits)`

Why?

Headers, and in general metadata, are key elements of source code documentation. It is a recommended good development practice.

Main features	Comments

`# Encoding`
`# Summary`
 	
`Author, Copyright, Credits, License, Version, Maintainer, Email, Status, etc.`
	`# Shorter pieces of text across the script`

Why?

Libraries are references to third-party sources and allows to use (or re-use) functions and other features developed beforehand.

Now you can write down your own code...

* Most likely, you will can start copy/paste-ing *

Variables

The use of computer's temporary memory

```
integer_var = 1
float_var = 1.23
char_var = ‘c’
string_var = ‘more than one
character’
bolean_var = True

date_var ??
```

Variables allow to store a broad sort of values, structures and objects to use it after in the script.

Global	Local

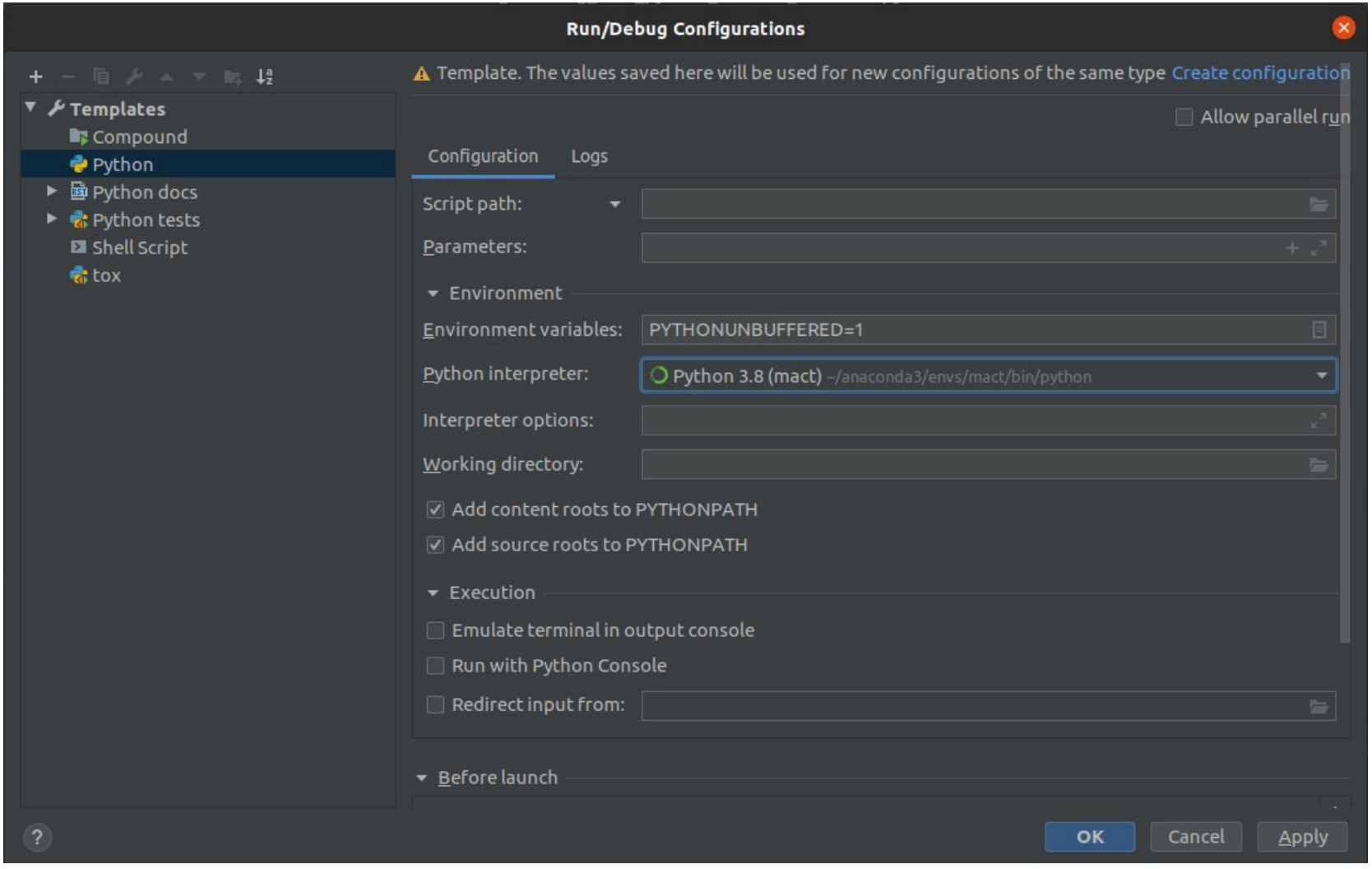
`local_variable = 1`
 	
`...`
 	
`def my_function(parameter):`
`    ...`
	`...`
	
	`def my_function(parameter):`
	`    local_variable = 1`

Variable = value

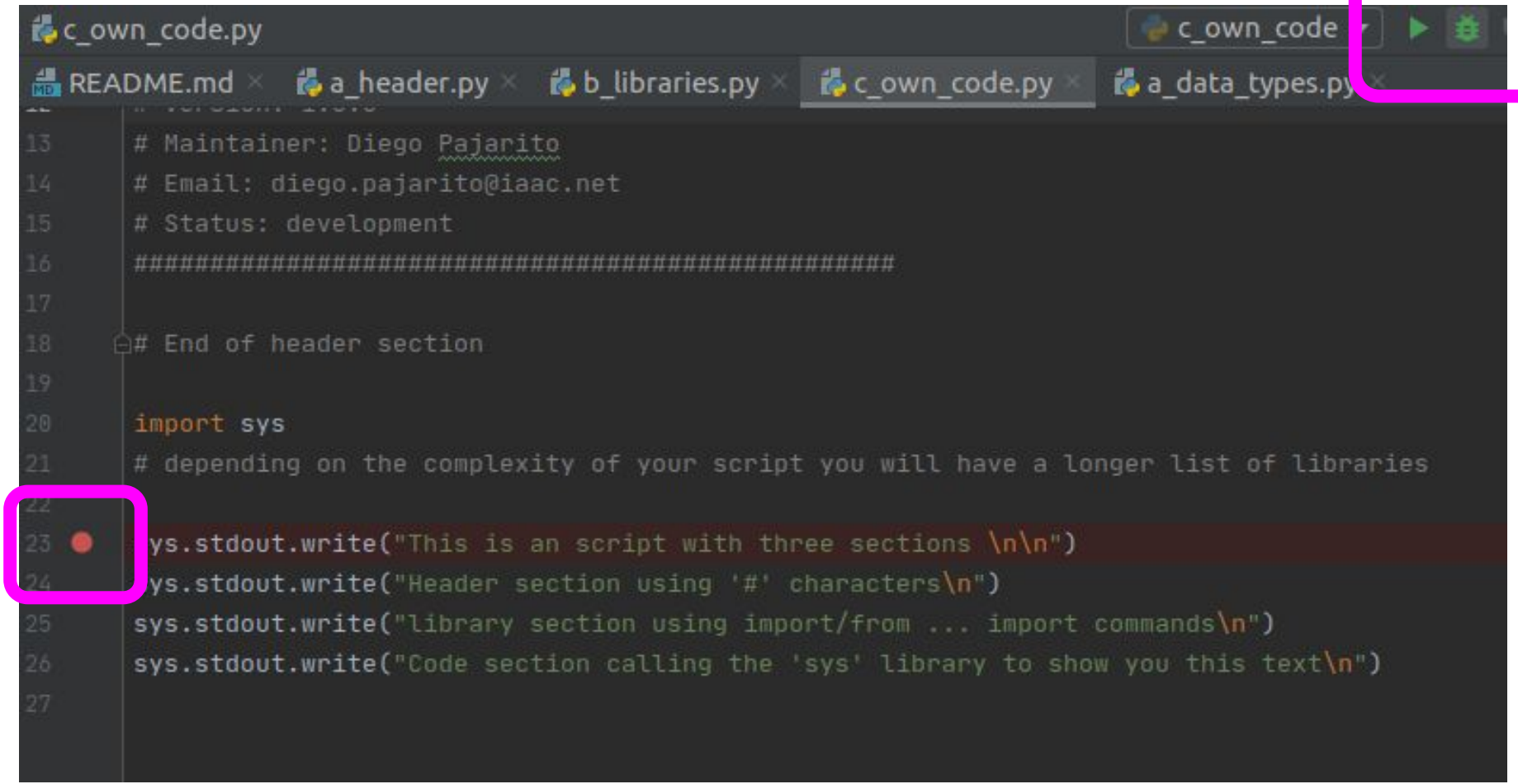
Variable_1 += value
Variable_2 -= value
Variable_1 *= value
Variable_1 /= value
...

+ - * / % // **

== != < <= > >=


Run/Debug Configurations
Templates
Compound
Python
Python docs
Python tests
Shell Script
tox
Template. The values saved here will be used for new configurations of the same type Create configuration
Allow parallel run
Configuration
Logs
Script path:
Parameters:
Environment
Environment variables:
PYTHONUNBUFFERED=1
Python interpreter:
Python 3.8 (mact) ~/anaconda3/envs/mact/bin/python
Interpreter options:
Working directory:
Add content roots to PYTHONPATH
Add source roots to PYTHONPATH
Execution
Emulate terminal in output console
Run with Python Console
Redirect input from:
Before launch
OK
Cancel
Apply

Menu: Run / Run...


c_own_code.py
c_own_code
README.md
a_header.py
b_libraries.py
c_own_code.py
a_data_types.py
Maintainer: Diego Pajarito
Email: diego.pajarito@iaac.net
Status: development
##
# End of header section
import sys
# depending on the complexity of your script you will have a longer list of libraries
ys.stdout.write("This is an script with three sections \n\n")
ys.stdout.write("Header section using '#' characters\n")
sys.stdout.write("library section using import/from ... import commands\n")
sys.stdout.write("Code section calling the 'sys' library to show you this text\n")

Flow control

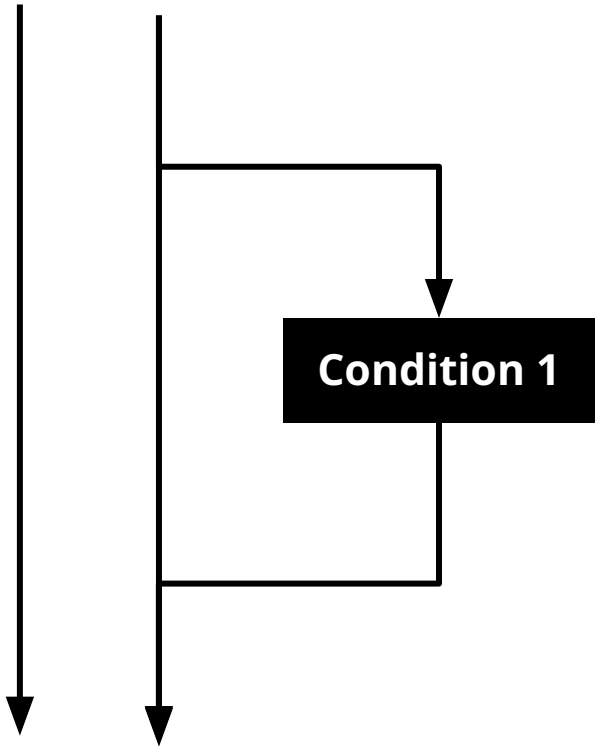
Conditionals and loops

if / else

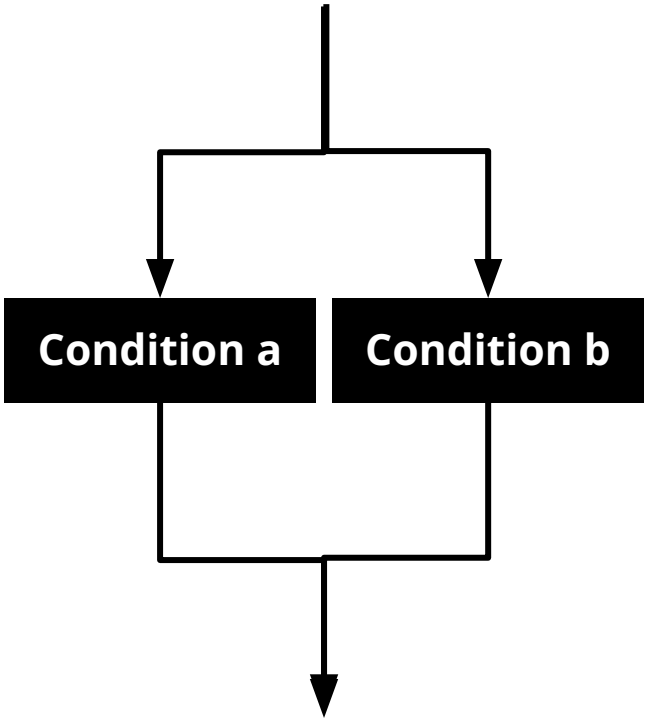
```
if a == b:
   var = 'something happens'


if a == b:
   var = 'something happens'
else:
   var = 'now happens here'

if a == b:
   var = 'something happens'
elif b != c:
   var = 'there are more options'
elif d < e:
   Var = 'there are more options'
else:
   var = 'now happens here'
```

switch

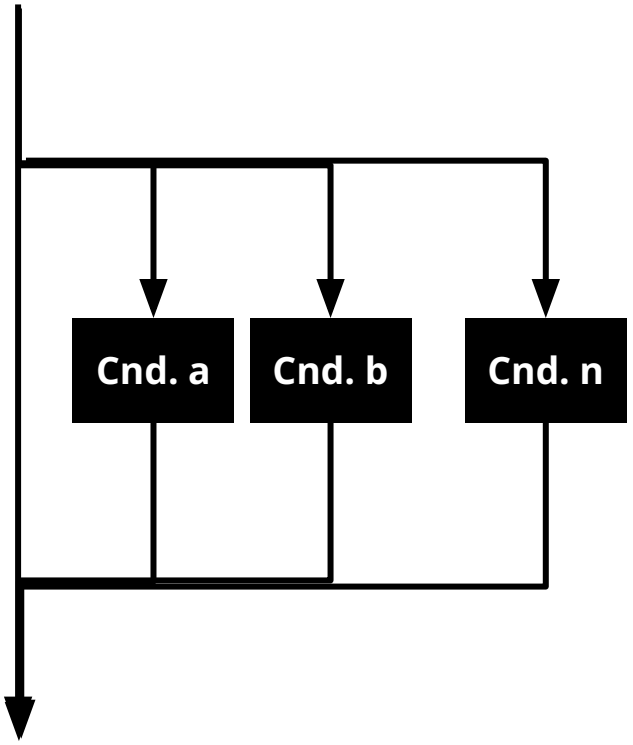
```
switch (variable) {
    case 'value_1':
        var = 'something happens";
        break;
    case 'value_2:
        var = 'or here";
        break;
    ...

    default:
        var = 'or if none of the above'
```



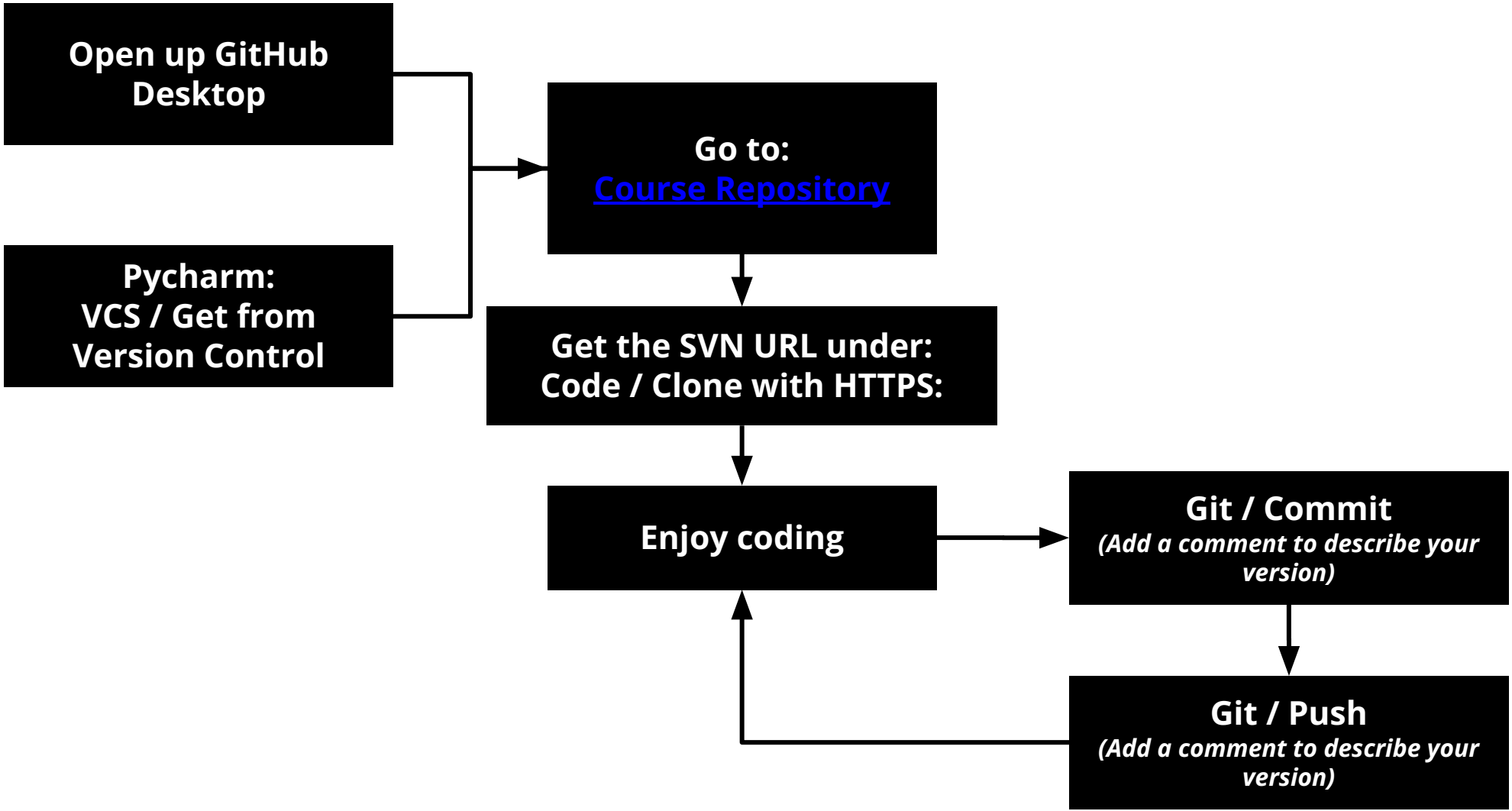
If clause



if / else clause

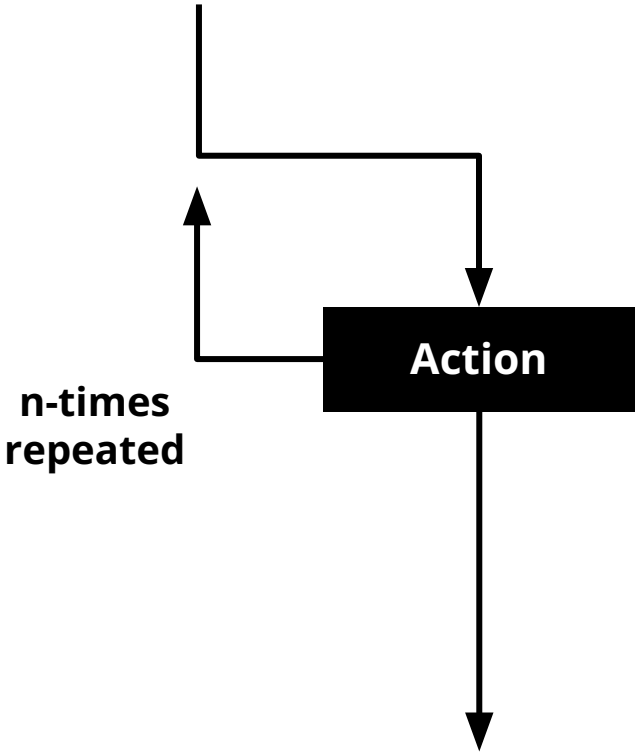


if / elif or switch clauses

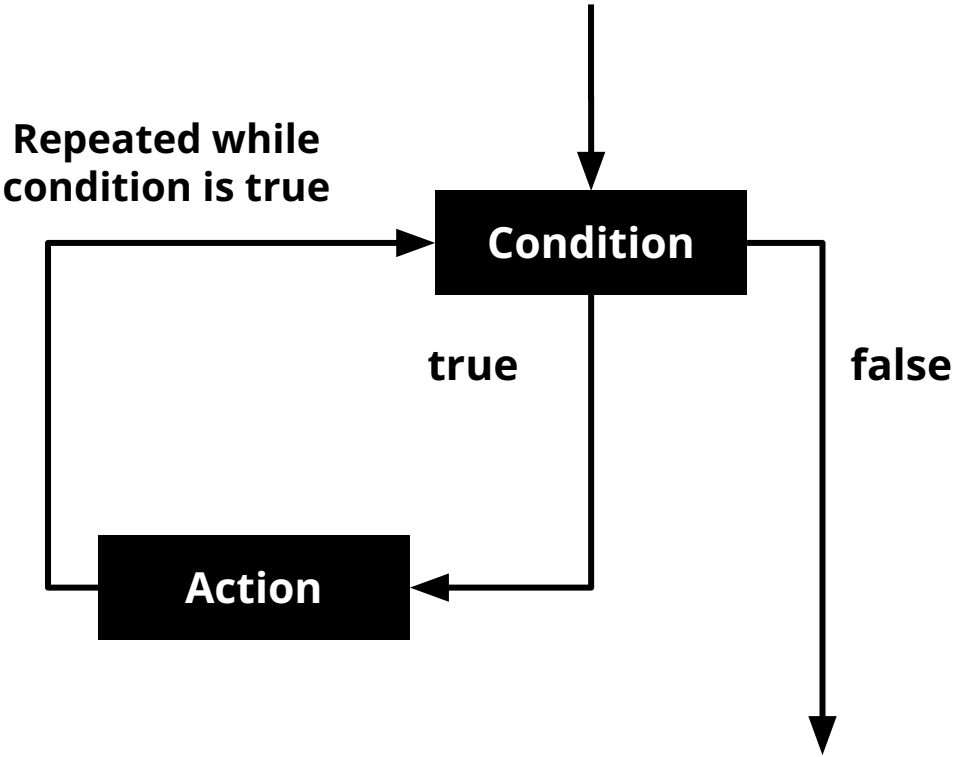

Open up GitHub Desktop
Pycharm: VCS / Get from Version Control
Go to: Course Repository
Get the SVN URL under: Code / Clone with HTTPS:
Enjoy coding
Git / Commit
(Add a comment to describe your version)
Git / Push
(Add a comment to describe your version)

for	while

`for i in range(start, end):`
`    var = value * i`
`    ..`
 	
`...`
	`while i < condition:`
	`    var = value * i`
	`    ...`
	`else:`
	`    var = 'condition is no longer true'`
	
	`...`



For loop

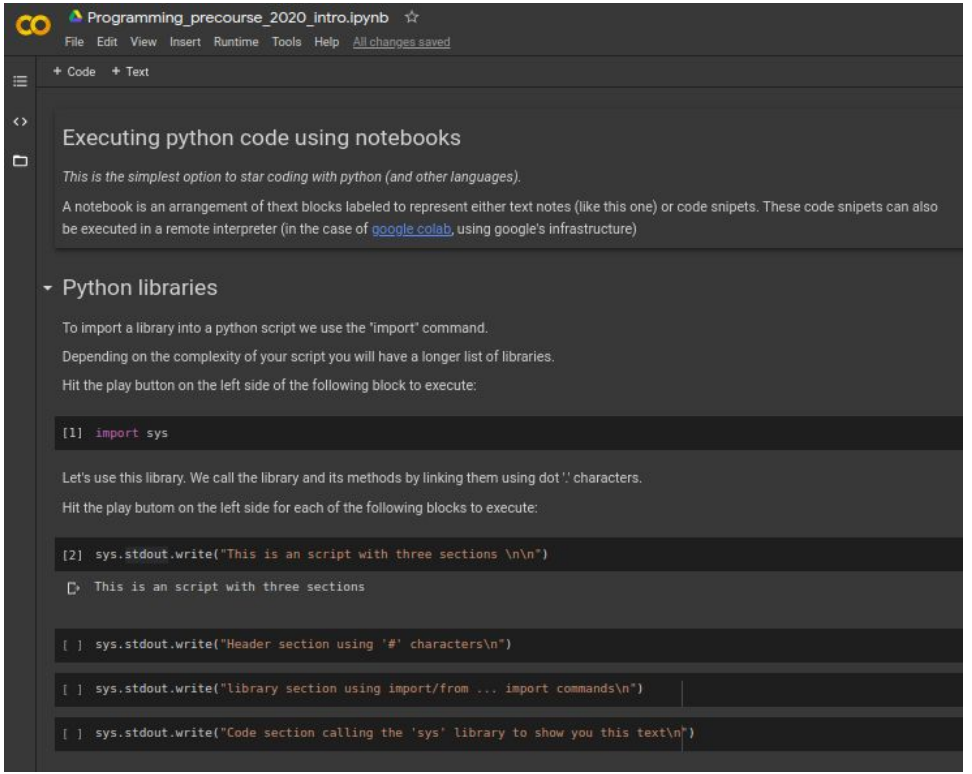


While loop

A web-based development environment.

No need to install or setup any additional software

You can try [this notebook] to start



Source: https://colab.research.google.com/

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