Institute for advanced architecture of Catalonia | BARCELONA

COMPUTER PROGRAMMING WITH PYTHON
MASTER PRE-COURSE SERIES
2020/2021

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_variable = 1

...

def my_function(parameter):
    ...
```

Local

```
...

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

Variable = value

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

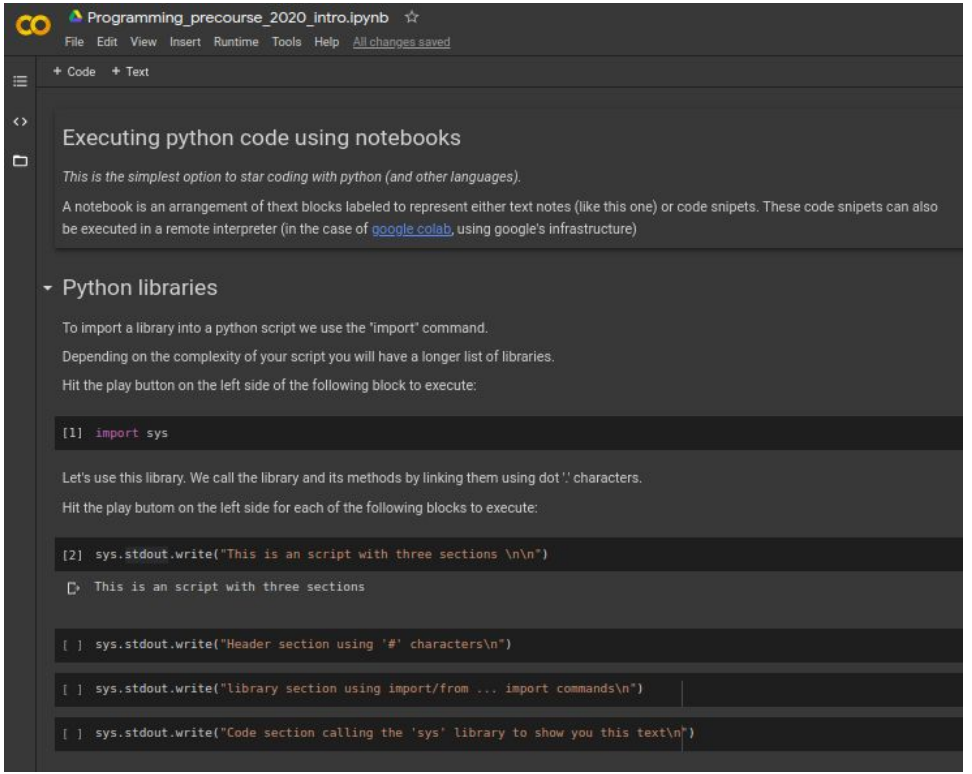
+ - * / % // **

== != < <= > >=

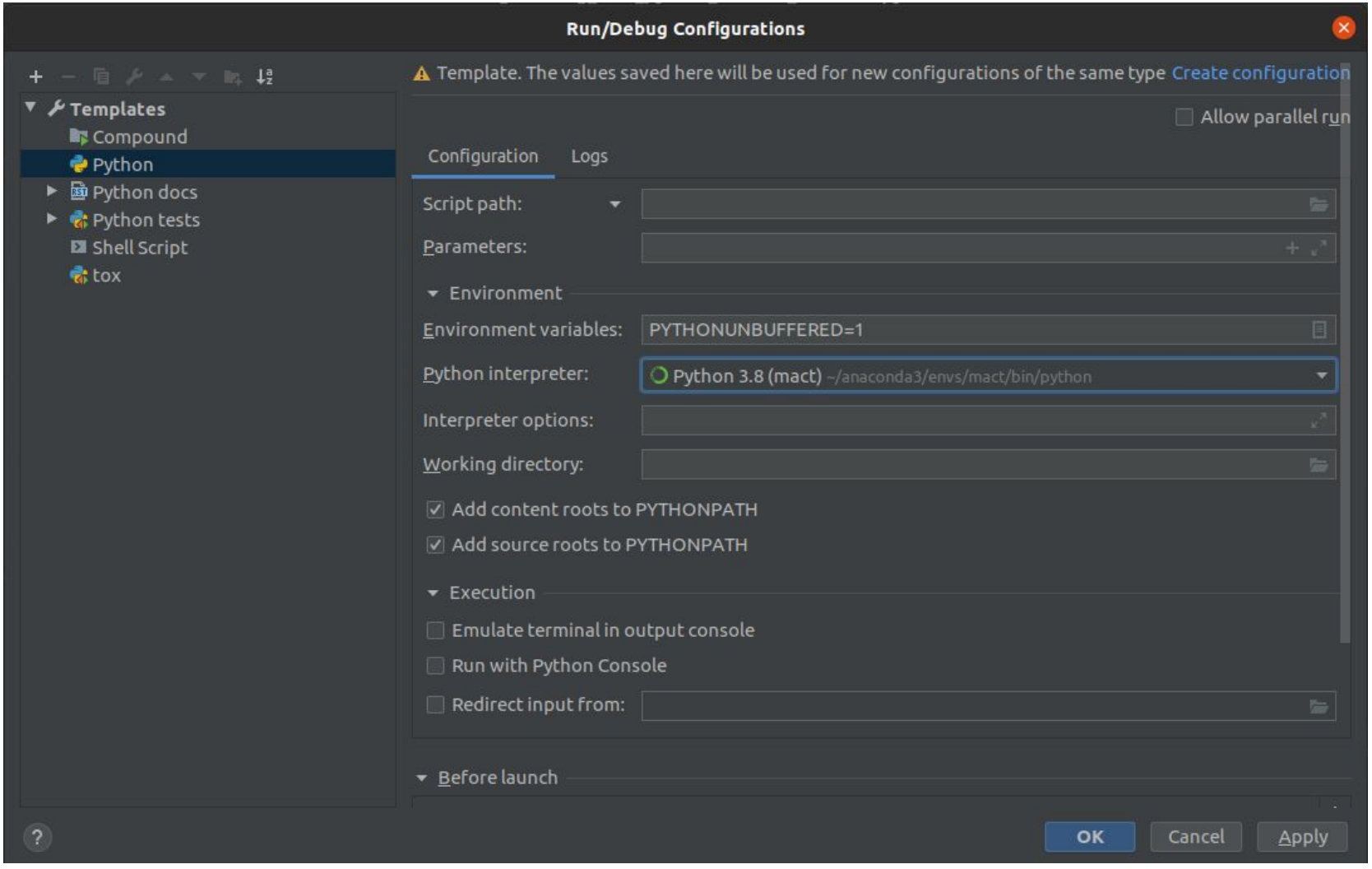
A web-based development environment.

No need to install or setup any additional software

You can try [this notebook] to start

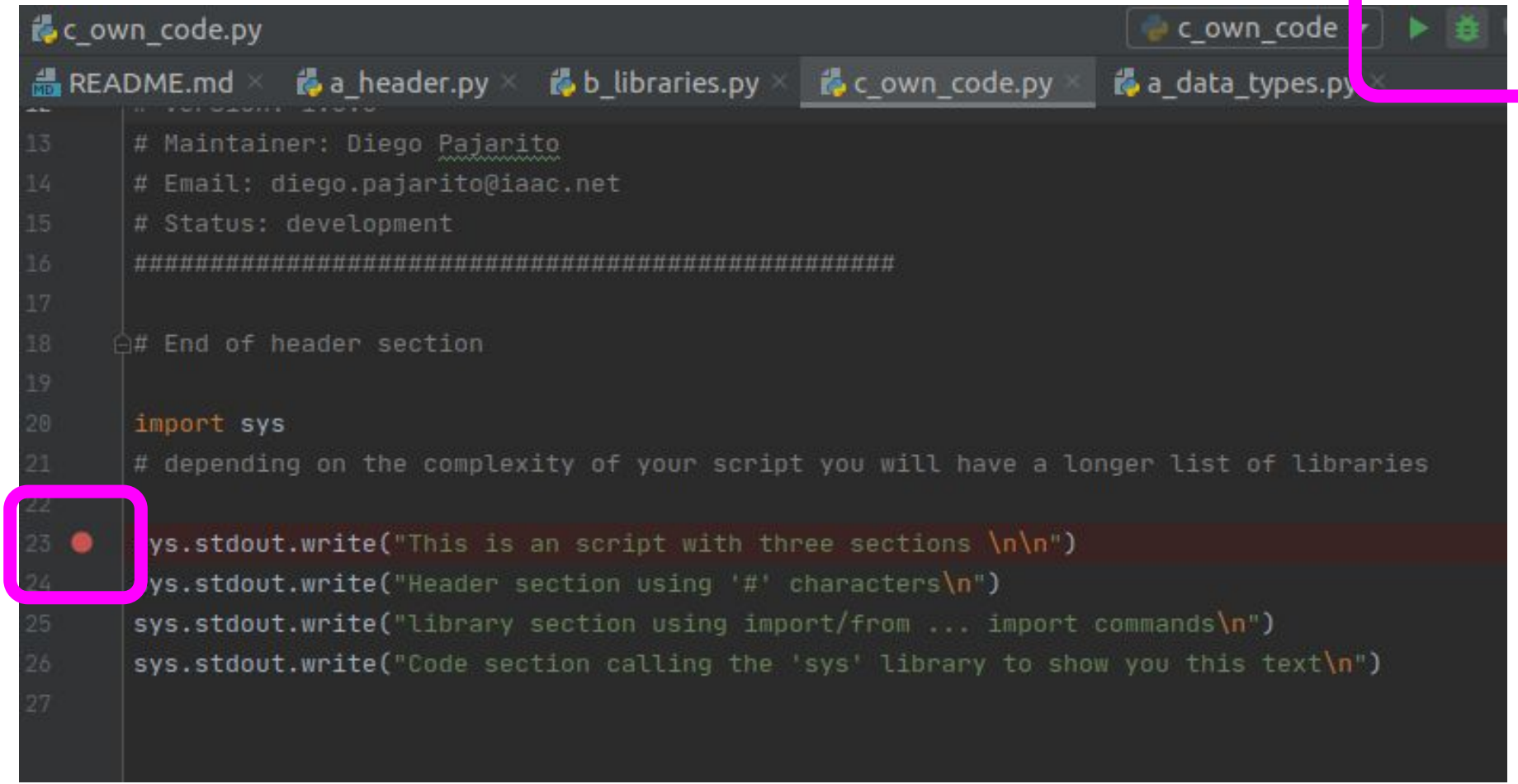


Source: https://colab.research.google.com/



Python Interpreter

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

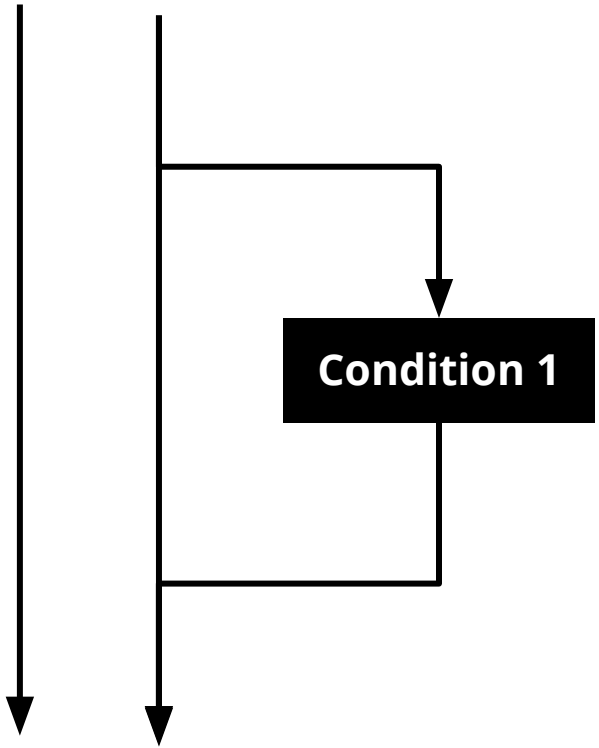
Conditionals and loops

if / else

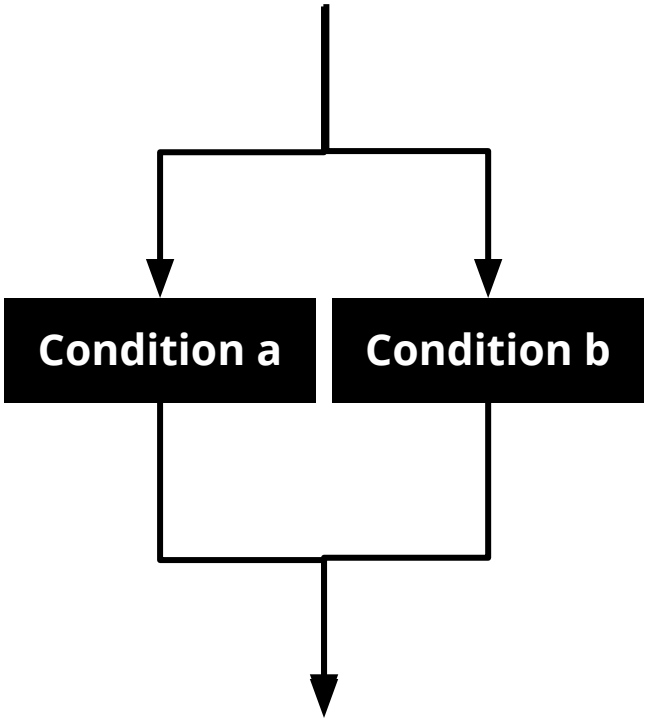
```
if a == b:
   var = 'something happens'


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

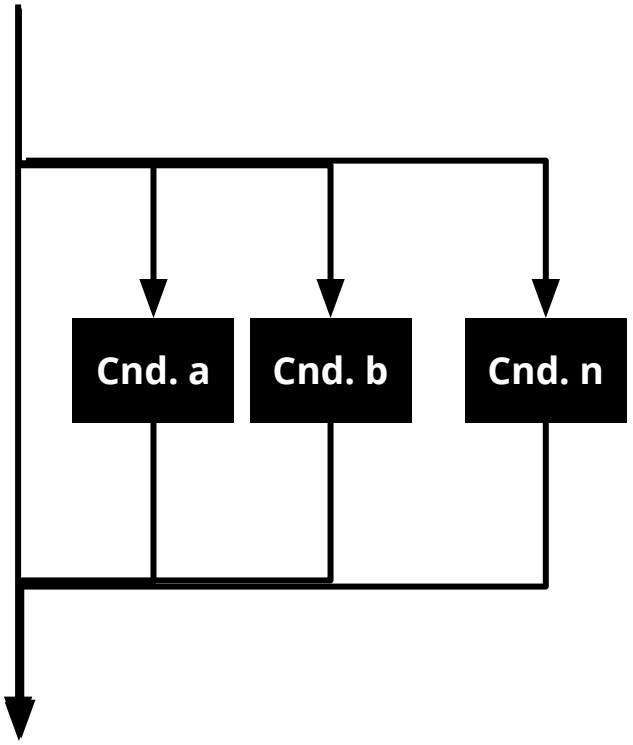
```
switch (variable) {
    case 'value_1':
        var = 'something happens";
        break;
    case 'value_2:
        var = 'or here";
        break;
    ...

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



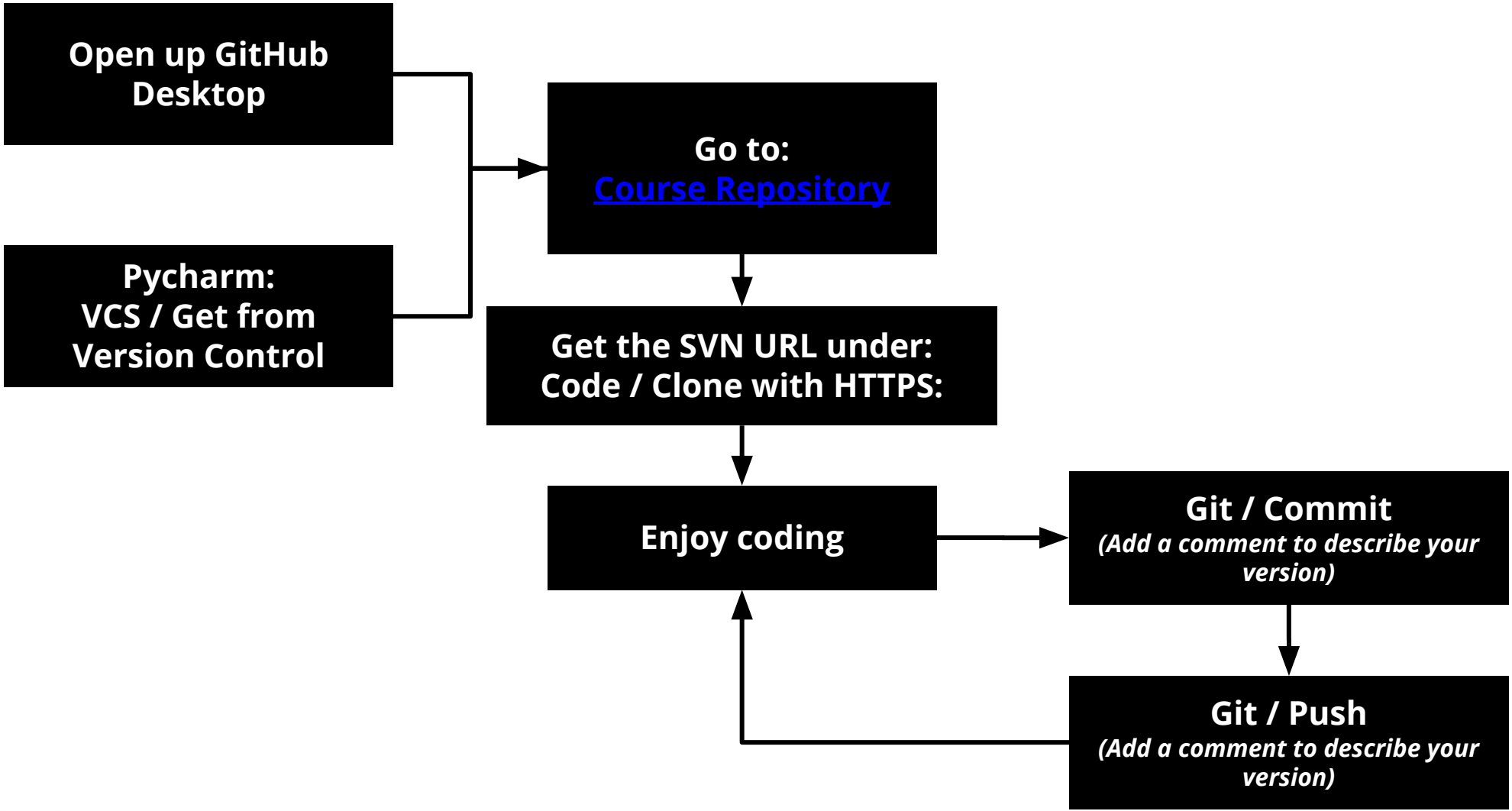
If clause



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'`
	
	`...`

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