PYTHON

S02 – E01

A l'aventure compagnons!

BIB 4.04.17

Winter - Licence MIT

PRÉSENTATION

DOCUMENTS

GIT

https://git-scm.com/downloads

```
git clone https://github.com/DocWinter/BiB-Workshops
```

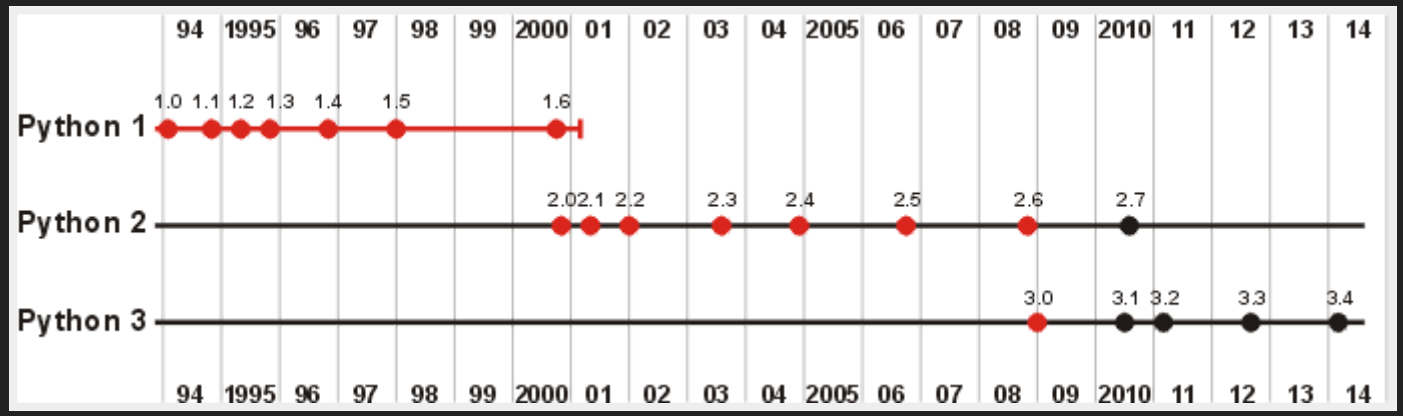
```
cd BiB-Workshops/python/S02
```

Ouvrir `E01.html` avec votre navigateur

HISTOIRE

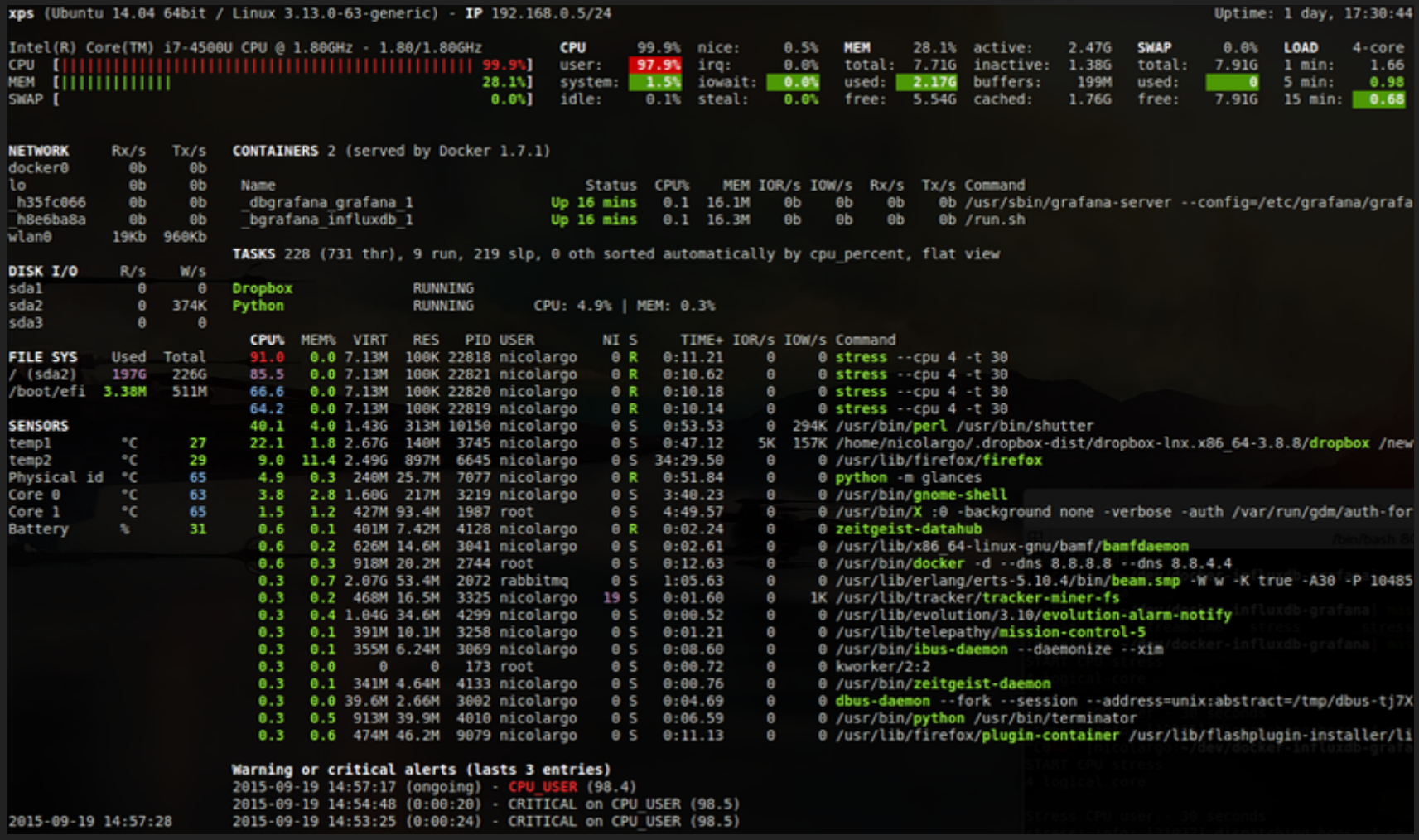
Guido Van Rossum

Versions

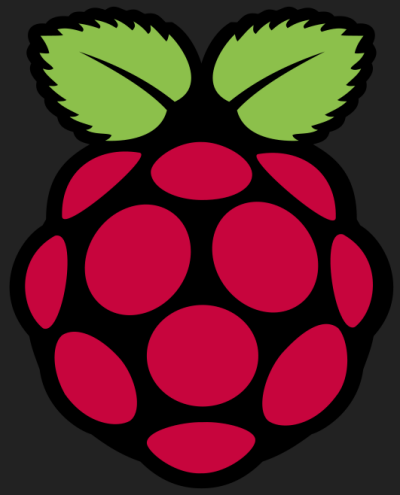

94 1995 96 97 98 99 2000 01 02 03 04 2005 06 07 08 09 2010 11 12 13 14
Python 1
1.0 1.1 1.2 1.3 1.4 1.5 1.6
Python 2
2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7
Python 3
3.0 3.1 3.2 3.3 3.4
94 1995 96 97 98 99 2000 01 02 03 04 2005 06 07 08 09 2010 11 12 13 14

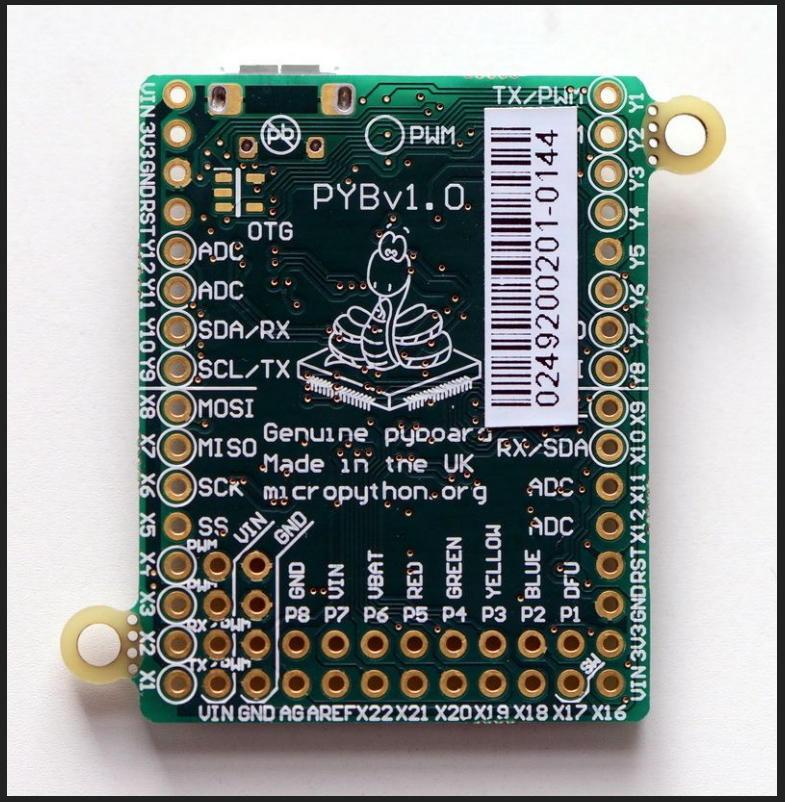
UTILISATION

SCRIPT


xps (Ubuntu 14.04 64bit / Linux 3.13.0-63-generic) - IP 192.168.0.5/24
Uptime: 1 day, 17:30:44
Intel(R) Core(TM) i7-4500U CPU @ 1.80GHz - 1.80/1.80GHz
CPU [99.9%]
MEM [28.1%]
SWAP [0.0%]
CPU 99.9% nice: 0.5% MEM 28.1% active: 2.47G SWAP 0.0% LOAD 4-core
user: 97.9% irq: 0.0% total: 7.71G inactive: 1.38G total: 7.91G 1 min: 1.66
system: 1.5% iowait: 0.0% used: 2.17G buffers: 199M used: 0 5 min: 0.98
idle: 0.1% steal: 0.0% free: 5.54G cached: 1.76G free: 7.91G 15 min: 0.68
NETWORK Rx/s Tx/s
docker0 0b 0b
lo 0b 0b
_h35fc066 0b 0b
_h8e6ba8a 0b 0b
wlan0 19Kb 960Kb
DISK I/O R/s W/s
sda1 0 0
sda2 0 374K
sda3 0 0
FILE SYS Used Total
/ (sda2) 197G 226G
/boot/efi 3.38M 511M
SENSORS
temp1 °C 27
temp2 °C 29
Physical id °C 65
Core 0 °C 63
Core 1 °C 65
Battery % 31
CONTAINERS 2 (served by Docker 1.7.1)
Name Status CPU% MEM IOR/s IOW/s Rx/s Tx/s Command
_dbgrafana_grafana_1 Up 16 mins 0.1 16.1M 0b 0b 0b 0b /usr/sbin/grafana-server --config=/etc/grafana/grafa
_bgrafana_influxdb_1 Up 16 mins 0.1 16.3M 0b 0b 0b 0b /run.sh
TASKS 228 (731 thr), 9 run, 219 slp, 0 oth sorted automatically by cpu_percent, flat view
Dropbox RUNNING
Python RUNNING CPU: 4.9% | MEM: 0.3%
CPU% MEM% VIRT RES PID USER NI S TIME+ IOR/s IOW/s Command
91.0 0.0 7.13M 100K 22818 nicolargo 0 R 0:11.21 0 0 stress --cpu 4 -t 30
85.5 0.0 7.13M 100K 22821 nicolargo 0 R 0:10.62 0 0 stress --cpu 4 -t 30
66.6 0.0 7.13M 100K 22820 nicolargo 0 R 0:10.18 0 0 stress --cpu 4 -t 30
64.2 0.0 7.13M 100K 22819 nicolargo 0 R 0:10.14 0 0 stress --cpu 4 -t 30
40.1 4.0 1.43G 313M 10150 nicolargo 0 S 0:53.53 0 294K /usr/bin/perl /usr/bin/shutter
22.1 1.8 2.67G 140M 3745 nicolargo 0 S 0:47.12 5K 157K /home/nicolargo/.dropbox-dist/dropbox-lnx.x86_64-3.8.8/dropbox /new
9.0 11.4 2.49G 897M 6645 nicolargo 0 S 34:29.50 0 0 /usr/lib/firefox/firefox
4.9 0.3 240M 25.7M 7077 nicolargo 0 R 0:51.84 0 0 python -m glances
3.8 2.8 1.60G 217M 3219 nicolargo 0 S 3:40.23 0 0 /usr/bin/gnome-shell
1.5 1.2 427M 93.4M 1987 root 0 S 4:49.57 0 0 /usr/bin/X :0 -background none -verbose -auth /var/run/gdm/auth-for
0.6 0.1 401M 7.42M 4128 nicolargo 0 R 0:02.24 0 0 zeitgeist-datahub
0.6 0.2 626M 14.6M 3041 nicolargo 0 S 0:02.61 0 0 /usr/lib/x86_64-linux-gnu/bamf/bamfdaemon
0.6 0.3 918M 20.2M 2744 root 0 S 0:12.63 0 0 /usr/bin/docker -d --dns 8.8.8.8 --dns 8.8.4.4
0.3 0.7 2.07G 53.4M 2072 rabbitmq 0 S 1:05.63 0 0 /usr/lib/erlang/erts-5.10.4/bin/beam.smp -W w -K true -A30 -P 10485
0.3 0.2 468M 16.5M 3325 nicolargo 19 S 0:01.60 0 1K /usr/lib/tracker/tracker-miner-fs
0.3 0.4 1.04G 34.6M 4299 nicolargo 0 S 0:00.52 0 0 /usr/lib/evolution/3.10/evolution-alarm-notify
0.3 0.1 391M 10.1M 3258 nicolargo 0 S 0:01.21 0 0 /usr/lib/telepathy/mission-control-5
0.3 0.1 355M 6.24M 3069 nicolargo 0 S 0:08.60 0 0 /usr/bin/ibus-daemon --daemonize --xim
0.3 0.0 0 0 173 root 0 S 0:00.72 0 0 kworker/2:2
0.3 0.1 341M 4.64M 4133 nicolargo 0 S 0:00.76 0 0 /usr/bin/zeitgeist-daemon
0.3 0.0 39.6M 2.66M 3002 nicolargo 0 S 0:04.69 0 0 dbus-daemon --fork --session --address=unix:abstract=/tmp/dbus-tj7X
0.3 0.5 913M 39.9M 4010 nicolargo 0 S 0:06.59 0 0 /usr/bin/python /usr/bin/terminator
0.3 0.6 474M 46.2M 9079 nicolargo 0 S 0:11.13 0 0 /usr/lib/firefox/plugin-container /usr/lib/flashplugin-installer/li
Warning or critical alerts (lasts 3 entries)
2015-09-19 14:57:17 (ongoing) - CPU_USER (98.4)
2015-09-19 14:54:48 (0:00:20) - CRITICAL on CPU_USER (98.5)
2015-09-19 14:53:25 (0:00:24) - CRITICAL on CPU_USER (98.5)
2015-09-19 14:57:28

HARDWARE



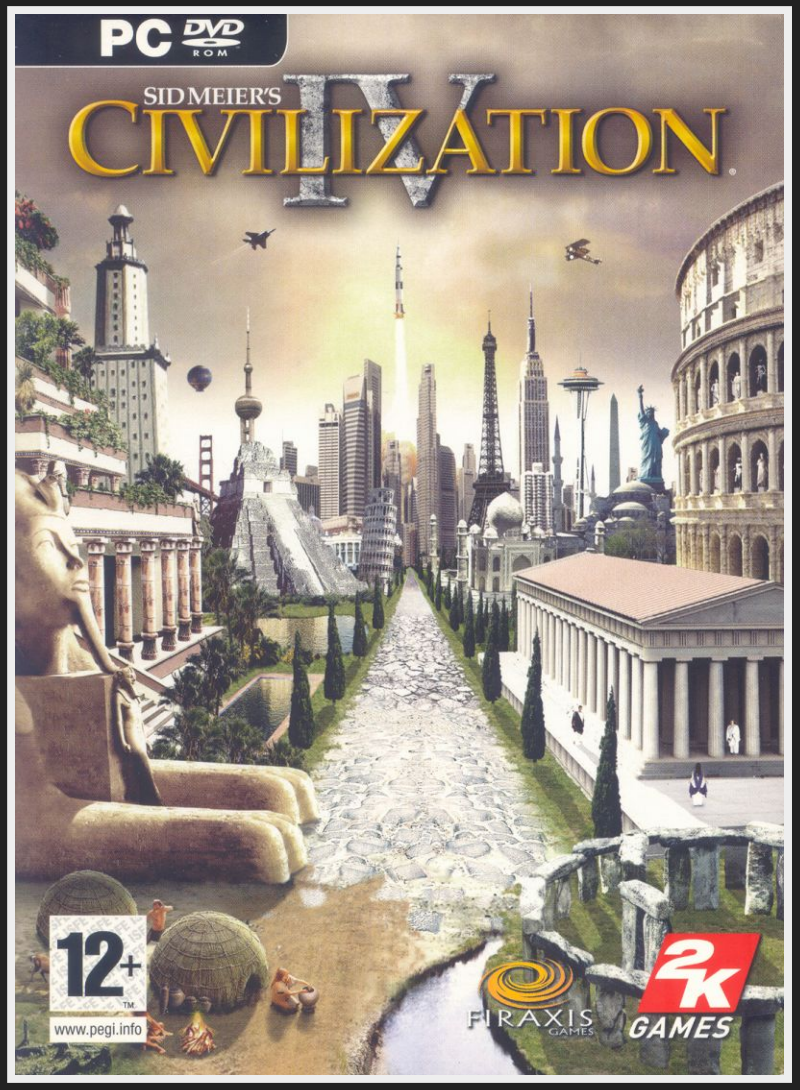

PYBv1.0
PWM
TX/PWM
OTG
ADC
ADC
SDA/RX
SCL/TX
MOSI
MISO
SCK
SS
Genuine pyboard
Made in the UK
micropython.org
RX/SDA
ADC
ADC
VIN
GND
P8 P7 P6 P5 P4 P3 P2 P1
GND VIN VBAT RED GREEN YELLOW BLUE DFU
VIN GND AGAREF X22 X21 X20 X19 X18 X17 X16
VIN 3V3 GND RST X12 X11 X10 X9 Y8 Y7 Y6 Y5 Y4 Y3 Y2 Y1
0249200201-0144

WEB

SCIENCE & BIG DATA

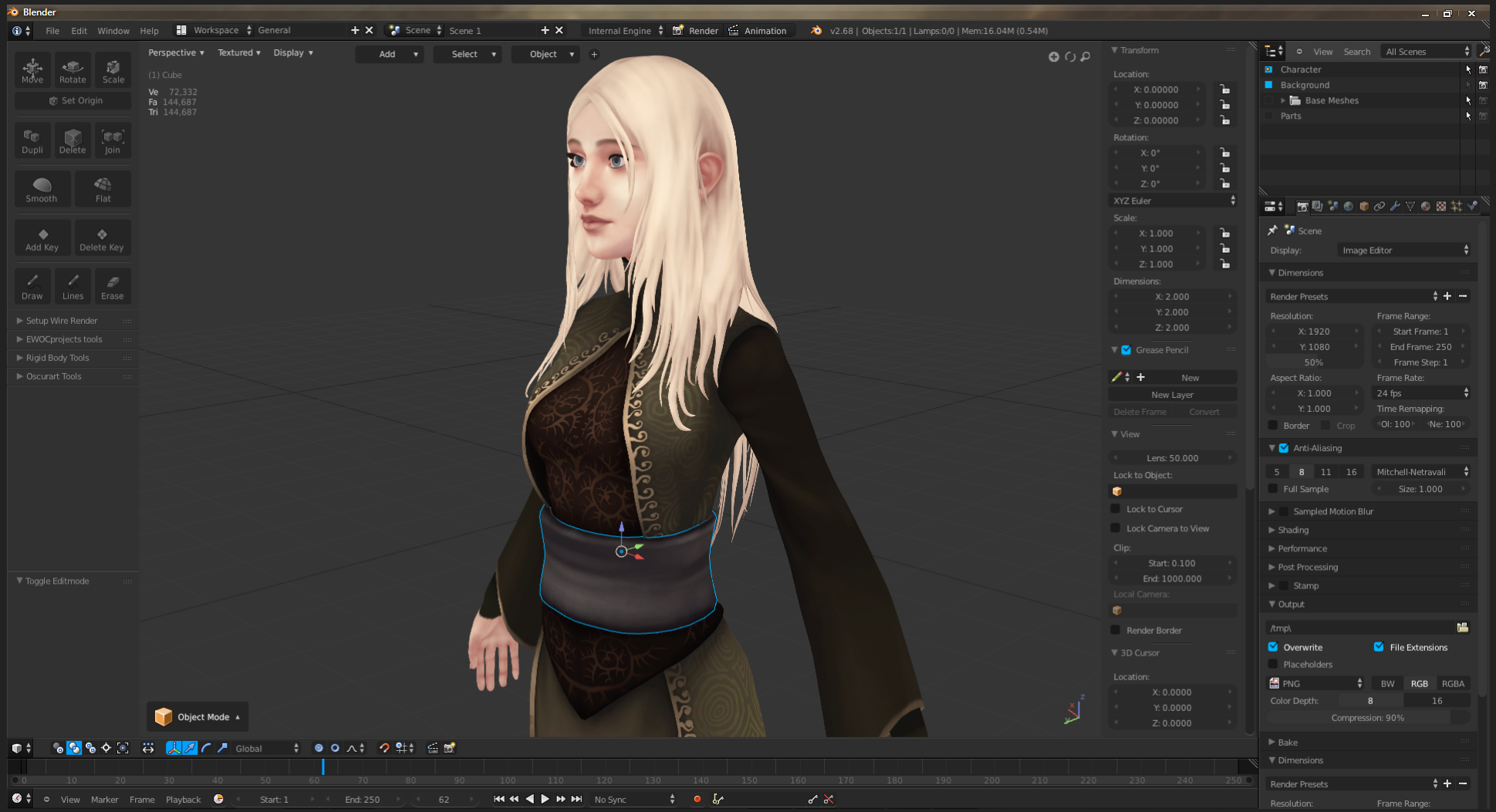
IP[y]: IPython
Interactive Computing

JEUX VIDÉOS


PC DVD ROM
SID MEIER'S
CIVILIZATION IV
12+
www.pegi.info
FIRAXIS GAMES
2K GAMES


CREA

3D


Blender
File Edit Window Help
Workspace General
Scene Scene 1
Internal Engine Render Animation
v2.68 | Objects:1/1 | Lamps:0/0 | Mem:16.04M (0.54M)
Perspective Textured Display
Add Select Object
(1) Cube
Ve 72,332
Fa 144,687
Tri 144,687
Move Rotate Scale
Set Origin
Dupli Delete Join
Smooth Flat
Add Key Delete Key
Draw Lines Erase
Setup Wire Render
EWOCprojects tools
Rigid Body Tools
Oscurart Tools
Toggle Editmode
Object Mode
Transform
Location:
Rotation:
XYZ Euler
Scale:
Dimensions:
Grease Pencil
New
New Layer
Delete Frame Convert
View
Lens: 50.000
Lock to Object:
Lock to Cursor
Lock Camera to View
Clip:
Start: 0.100
End: 1000.000
Local Camera:
Render Border
3D Cursor
Location:
View Search All Scenes
Character
Background
Base Meshes
Parts
Scene
Display: Image Editor
Dimensions
Render Presets
Resolution:
Frame Range:
Aspect Ratio:
Frame Rate:
Time Remapping:
Border Crop
Anti-Aliasing
Full Sample
Sampled Motion Blur
Shading
Performance
Post Processing
Stamp
Output
/tmp\
Overwrite
File Extensions
Placeholders
PNG
Color Depth:
Compression: 90%
Bake
Global
View Marker Frame Playback
Start: 1
End: 250
No Sync

INSTALLATION

LINUX

https://github.com/pyenv/pyenv-installer

```
$ curl -L https://raw.githubusercontent.com/pyenv/pyenv-installer
```

```
# UBUNTU & FEDORA
$ echo 'export PYENV_ROOT="$HOME/.pyenv"' >> ~/.bashrc
$ echo 'export PATH="$PYENV_ROOT/bin:$PATH"' >> ~/.bashrc
$ echo 'eval "$(pyenv init -)"' >> ~/.bashrc
```

```
# AUTRES
$ echo 'export PYENV_ROOT="$HOME/.pyenv"' >> ~/.bash_profile
$ echo 'export PATH="$PYENV_ROOT/bin:$PATH"' >> ~/.bash_profile
$ echo 'eval "$(pyenv init -)"' >> ~/.bash_profile
```

```
$ exec $SHELL
```

```
$ pyenv update
$ pyenv install 3.6.0
$ pyenv global 3.6.0
```

OSX

https://brew.sh/

```
$ /usr/bin/ruby -e "$(curl -fsSL https://raw.githubusercontent.co
$ brew install pyenv
```

```
$ echo 'export PYENV_ROOT="$HOME/.pyenv"' >> ~/.bashrc
$ echo 'export PATH="$PYENV_ROOT/bin:$PATH"' >> ~/.bashrc
$ echo 'eval "$(pyenv init -)"' >> ~/.bashrc
```

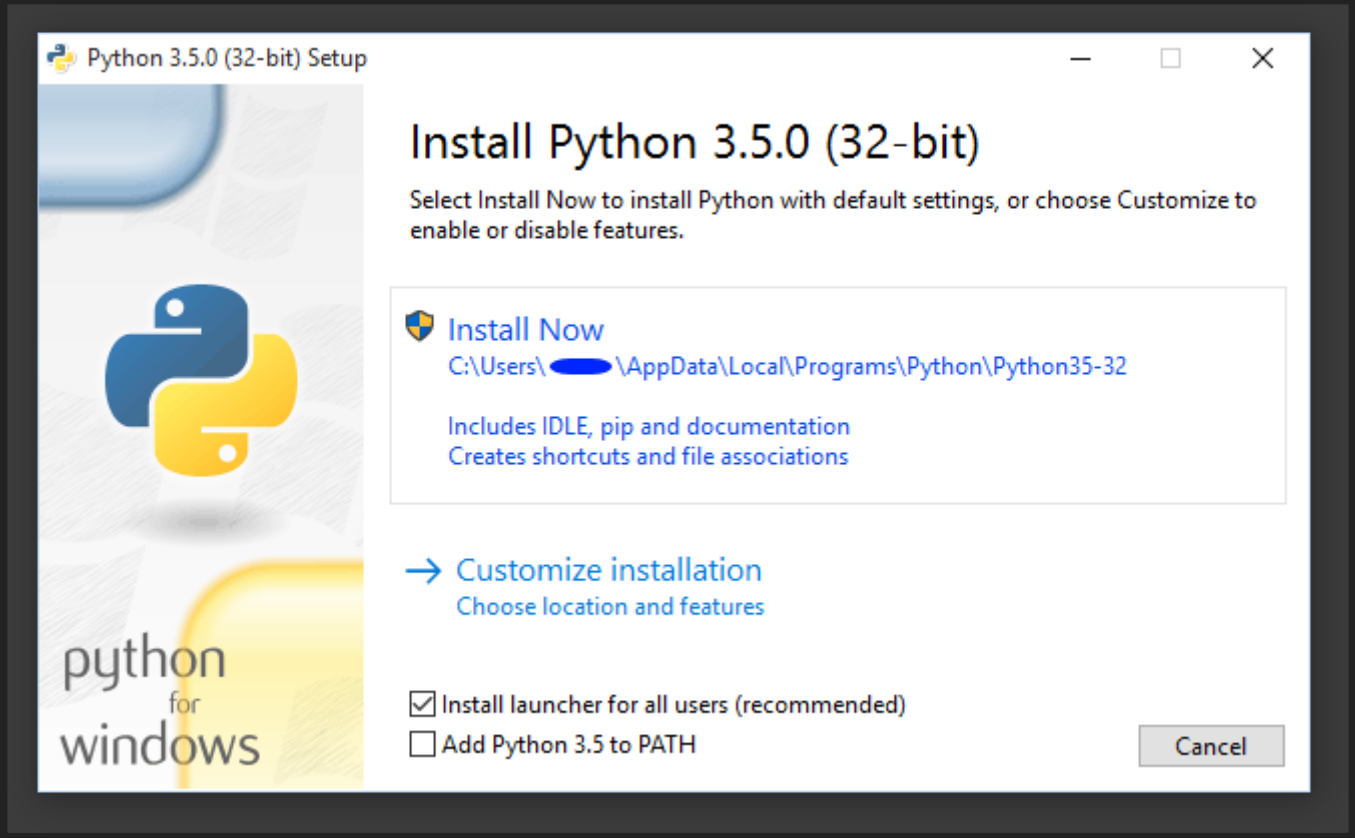
```
$ exec $SHELL
```

```
$ pyenv update
$ pyenv install 3.6.0
$ pyenv global 3.6.0
```

WINDOWS

https://www.python.org/downloads/

Accepter de mettre Python dans votre PATH



HELLO, WORLD!

INTERPRETEUR

```
$ python
```

```
Python 3.6.0 (default, Dec 24 2016, 00:01:50)
[GCC 4.2.1 Compatible Apple LLVM 8.0.0 (clang-800.0.42.1)] on dar
Type "help", "copyright", "credits" or "license" for more informa
```

```
>>> print("Hello, World!")
Hello, World
```

VARIABLES

THÉORIE

C, C++	Python
Typage statique	Typage dynamique
Variable	Référence
Position mémoire	Etiquetage d'objet

CONVENTIONS

Les noms doivent être clairs :

```
>>> f = 'log.txt' # Non
>>> fichier = 'log.txt' # Oui
```

Les noms ne doivent pas contenir de caractères spéciaux :

```
>>> døññéês!cliěnt = 'data.db' # Non
>>> donnees_client = 'data.db' # Oui
```

Les noms doivent être en miniscules :

```
>>> données_client = 'data.db' # Non
>>> donnees_client = 'data.db' # Oui
```

Les mots doivent être séparés par des _ :

```
>>> nomDuChat = 'Le Chat' # Non
>>> nom_du_chat = 'Le Chat' # Oui
```

Les noms ne doivent pas être utilisés par Python :

```
>>> class = 'Le Chat' # Non
>>> if = 'Le Chien' # Non
```

Evitez le français :

```
>>> nom_du_chat = 'Le Chat' # Non
>>> cat_name = 'Le Chat' # Oui
```

TYPES DE BASE

Français	Python
Entiers	int
Flottants	float
Booléens	bool
Texte	string

ENTIER

```
>>> 10
10
```

```
>>> -1334
-1334
```

INT()

```
>>> int("110")
110
```

```
>>> int("110", 2)
6 # 2^2 + 2^1
```

```
>>> int("FF", 16)
255 # 15*16^1 + 15
```

```
>>> int(3.3)
3
```

FLOTTANT

```
>>> 123.45
123.45
```

```
>>> -.123
-0.123
```

```
>>> 10e-3
0.01
```

FLOAT()

```
>>> float(42)
42.0
```

```
>>> float('666.999')
666.999
```

BOOLÉEN

```
>>> True
True
```

```
>>> False
False
```

BOOL()

```
>>> bool(True)
True
```

```
>>> bool()
False
```

```
>>> bool(1)
True
```

```
>>> bool(0)
False
```

```
>>> bool(-1)
True
```

TEXTE

```
>>> 'Je suis ton père!'
'Je suis ton père!'
```

```
>>> "I'm your father!"
"I'm your father!"
```

```
>>> """Anakin
... Leila
... Luke"""
'Anakin\nLeila\Luke'
```

STR()

```
>>> str(88)
'88'
```

```
>>> str(-34.43)
'-34.43'
```

```
>>> str(True)
'True'
```

OPÉRATIONS
ARITHMÉTIQUE – ASSIGNATION

ARITHMÉTIQUE

NOMBRE

```
>>> 10 + 10
20
```

```
>>> 10 - 10
0
```

```
>>> 10 * 10
100
```

```
>>> 10 ** 3
1000
```

```
>>> 10 / 10
1.0
```

```
>>> 10 / 3
3.3333333333333335
```

```
>>> 10 // 3
3
```

```
>>> 10 % 2
0
```

ARITHMÉTIQUE
TEXTE

```
>>> 'Hello,' + ' World!'
'Hello, World!'
```

```
>>> 'Moshi'*2
'MoshiMoshi'
```

```
>>> 'Date : ' + 4 + ' avril.'
TypeError: Must be str, not int
```

```
>>> 'Date : ' + str(4) + ' avril.'
'Date : 4 avril'
```

ASSIGNATION

```
>>> a, b = 10, 'test '
# a = 10, b = 'test'
```

```
>>> a += 10
# a = 20
```

```
>>> a -= 10
# a = 10
```

```
>>> a *= 10
# a = 100
```

```
>>> a **= 2
# a = 10000
```

```
>>> a /= 10
# a = 1000
```

```
>>> a //= 3
# a = 333
```

```
>>> a %= 2
# a = 1
```

```
>>> b *= 3
# b = 'test test test '
```

```
>>> b += "échec!"
# b = 'test test test échec!'
```

ENTRÉES ET SORTIES

FICHIER PYTHON / MODULE

script.py

```
#!/usr/bin/env python3

print("Hello, World!")
```

```
chmod +x script.py
./script.py
```

```
python script.py
```

PRINT

```
>>> print("Hello, World!")
Hello, World!
```

```
>>> print(1)
1
```

```
>>> heures = 19
>>> minutes = 30
```

```
>>> print("Il est " + heures + ":" + minutes.)
# TypeError: Must be str, not int
```

```
>>> print("Il est {}:{}.".format(heures, minutes))
Il est 19:30.
```

```
>>> print(f"Il est {heures}:{minutes}.")
Il est 19:30.
```

INPUT

```
>>> input()
```

```
>>> input("Quelle est la couleur du cheval noir d'Henri IV? ")
```

```
>>> input("Quelle est la couleur du cheval noir d'Henri IV?\n")
```

```
>>> réponse = input("Quelle heure est il? ")
```

TD

1. Posez des questions
2. Récupérez les réponses
3. Affichez les de manière sympathique

```
##################################
--   NYPD  --
Fichier 0312:
-------------
Nom : John Doe
Date de Naissance: 01/01/2042
Nationalité: Américaine
Job: Hacker
------------
##################################
```

CONDITIONS

OPÉRATIONS
COMPARAISON – LOGIQUE

COMPARAISON

```
>>> a, b = 10, 20
```

```
>>> a == b
False
```

```
>>> a != b
True
```

```
>>> a > b
False
```

```
>>> a < b
True
```

```
>>> a >= b
False
```

```
>>> a <= b
True
```

LOGIQUE

```
>>> not True
False
```

```
>>> not False
True
```

```
>>> True and True
True
```

```
>>> True or True
True
```

```
>>> True and False
False
```

```
>>> True or False
True
```

```
>>> False and False
False
```

```
>>> False or False
False
```

IF … ELIF … ELSE

IF

Pseudo Code

```
SI expression ALORS action
```

Python

```
>>> if expression:
...     action
```

EXEMPLE

```
>>> a = 1
>>> if a == 1:
...     print('a est égal à 1')

a est égal à 1
```

```
>>> b = 0
>>> if b == 1:
...     print('b est égal à 1')

# Rien ne se passe
```

IF ... ELSE

Pseudo Code

```
SI expr ALORS action1
SINON action2
```

Python

```
>>> if expression:
...     action1
... else:
...     action2
```

EXEMPLE

```
>>> a = 10
>>> if a % 2 == 0:
...     print('a est pair')
... else:
...     print('a est impair')
```

```
a est pair
```

IF ... ELIF ... ELSE

Pseudo Code

```
SI       expr1 ALORS action1
SINON SI expr2 ALORS action2
SINON action3
```

Python

```
>>> if expression1:
...     action1
... elif expression2
...     action2
... else:
...     action3
```

EXEMPLE

```
>>> age = 42
>>> if 0 <= age < 18:
...     print('Enfant')
... elif 18 <= age < 65:
...     printf('Adulte')
... else
...     printf('Retraité')
```

```
Adulte
```

TD

1. Reprenez le TD précédent
2. Créez des questions dépendantes aux précédentes réponses
3. Affichez une synthèse sympathique

- Si l'utilisateur à **un job**, combien de **temps** a-t-il travaillé?
- Si l'utilisateur est dans **un couple**, est-il **marié**?
- Si l'utilisateur à **un certain âge**, est-il **toujours à l'école**?