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# Setup Python with Linux kernel in Windows 10

WSL (Windows Subsystem for Linux) + Python with Jupyter Notebook (Anaconda installation)

Disclaimer: The instructions were tested using Ubuntu installation.

## 1. Install WSL

https://docs.microsoft.com/en-us/windows/wsl/install-win10

Before installation, check that your Win 10 version is compatible with LInux subsystem installation.

### 1.1. Enable WLS feature in Win 10

1. Run Win Powershell as admin
2. Execute:
   `Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Windows-Subsystem-Linux`

### 1.2. Download/install Linux

3. From Microsoft store
   Search for the Linux you prefer (Ubuntu, Kali Linux, etc.)
4. Check from the system requirements that your Win 10 version is compatible. Upgrade Win 10 if needed before proceeding further.
5. *Install* Linux version that you prefer (Ubuntu, Kali Linux, etc.)
6. In Microsoft Store
   *Start* the installed Linux

Linux Bash Window opens, with text: *Installing, this may take a few minutes…*

7. Wait
8. Give new username and password (these are separate from Win username and pw)
9. Wait and finalize the installation

### 1.3. Update the installation and upgrade packages

10. Update and upgrade the Linux installation
    `$ sudo apt update`
    `$ sudo apt upgrade`

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### 1.4. Define data access between Win 10 and Linux

Access your Win 10 files from Linux with symbolic link

**Note!** do NOT try to do the opposite direction

Example contains Seafile folder in Win (could be dropbox or anything):
Win folder C:\Users\<Windows user>\Seafile (exists)
This would be in Linux /home/<Linux User>/Seafile (does not exist)

11. In Linux bash:
    $ ln -s "/mnt/c/Users/<Windows User>/Seafile" /home/<Linux User>/Seafile

(In case of problems, remove the softlink: unlink /home/<Linux User>/Seafile)

WSL references, tips and tricks:
https://docs.microsoft.com/en-us/windows/wsl/interop
https://docs.microsoft.com/en-us/windows/wsl/faq

## 2. Setup graphical interface

### 2.1. Install X interface in Windows

12. Install VcXsr: https://sourceforge.net/projects/vcxsrv/

### 2.2. Install xfce4 in Linux

13. In Linux bash:
    $ sudo apt-get install xfce4

### 2.3. Test X interface

14. Install Firefox (to open the jupyter notebook GUI):
    $ sudo apt-get install firefox

Log out from bash if you have not done that after xfce4 installation, then log in again

15. Start Xlaunch in Win 10 (installed with VcXsrv, start VcXsrv before it if needed)
16. In Linux bash:
    $ export DISPLAY=localhost:0.0
    Note that the number should correspond to the VcXsrv Icon details (see picture on right)
17. Start Firefox:
    $ firefox


Firefox should open in a new window. Ignore warning, if everything works ok otherwise.

If Firefox does not open properly, troubleshoot and correct before proceeding to next step, as Firefox is needed in the Anaconda output.

Video instructions: https://www.youtube.com/watch?v=VSqAyOY5huQ

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### Note!

The graphical interface needs to be either defined in each bash session (#1) or included in configuration (#2).

**#1** When opening a new bash, define the output (before launching any graphical output):

```
$ export DISPLAY=localhost:0.0
```

**#2** Edit configuration

```
$ nano ~/.bashrc
```

add with proper commenting

```
export DISPLAY=localhost:0.0
```

Tips for nano shortcuts: https://wiki.gentoo.org/wiki/Nano/Basics_Guide

## 3. Install Anaconda

Check the latest anaconda: https://www.anaconda.com/download/#linux

1. Download it (change the example file name according to the version you want to install)

```
$ wget https://repo.anaconda.com/archive/Anaconda3-5.2.0-Linux-x86_64.sh
```

2. Install it:

```
$ bash Anaconda3-5.2.0-Linux-x86_64.sh
```

(tested with: path: yes; MS VScode: yes)

Consider running these before running you jupyter notebook (or you probably need to run them soon anyway):

```
$ pip install --upgrade pip
$ pip install msgpack
```

Note!
pip installation can be done in jupyter notebook by including exclamation mark in the beginning of the line, e.g.

```
In [6]: !pip install hl7
```

Anaconda references, tips and tricks:
https://opensource.com/article/18/4/getting-started-anaconda-python
https://www.anaconda.com/download/
https://conda.io/docs/user-guide/install/linux.html

# 4. Use Python

Open Linux bash.

If bash shell script does not contain the display setting (Note#2 in 2.3), run in the beginning of you bash session:

```
$ export DISPLAY=localhost:0.0
```

Use jupyter notebook:

```
$ jupyter notebook
```

or use anaconda navigator (includes jupyter notebook and a lot more):

```
$ anaconda-navigator
```