Software installation guide for Windows machine

> Minimum requirement version of Windows is Windows 10 version 1903 or higher!
> The installation should probably take at least 5GB of storage

1) Windows subsystem for Linux (WSL)

- open Windows Powershell as Administrator and run the following commands repectively,

  ```
  dism.exe /online /enable-feature /featurename:Microsoft-Windows-Subsystem-Linux /all /norestart
  ```

  ```
  dism.exe /online /enable-feature /featurename:VirtualMachinePlatform /all /norestart
  ```

- run the update for WSL using the file from this link, download the setup and double-click to run the setup:
  Link to the file from Microsoft website

- Restart your machine

- After restart, open PowerShell as Administrator again and run this command:

  ```
  wsl --set-default-version 2
  ```

- If you have any problems, you can follow the instruction on this site **Windows Subsystem for Linux Installation Guide for Windows 10**

2) Linux distribution

- The Linux distributions are available in Microsoft Store, You're free to choose one from the list! For this guide, we'll use 'Debian' as our example. Download it from Microsoft store then Linux icon will appear in start menu.

  > Ubuntu 16.04 LTS
  > Ubuntu 18.04 LTS
  > Ubuntu 20.04 LTS
  > openSUSE Leap 15.1
  > SUSE Linux Enterprise Server 12 SP5
  > SUSE Linux Enterprise Server 15 SP1
  > Kali Linux
  > **Debian GNU/Linux (Recommended)**
  > Fedora Remix for WSL
  > Pengwin
  > Pengwin Enterprise
  > Alpine WSL

- After Linux is installed, open it by clicking the icon in start menu, and Linux console will appear. Wait until the console ask you to create the UNIX user account. Enter the username and password of your choice. For our example:

  > username: user
  > password: 1a2b3c

- After finish set up Linux user, you have to run the following command:

  ```
  sudo apt-get update
  sudo apt-get upgrade
  sudo apt-get install wget
  ```

For those of you who are not familiar with using Linux with command-line based interface, please take a moment to familiarise yourself with basic commands such as open, create or change directory, create, edit or delete a file. There are many introductory tutorials easy to follow on the internet.

Access to normal Windows directory in WSL can be done by simple Linux command:
For example,

```
cd /mnt/c
```
will change the directory to the local drive, i.e. 'Drive C'

You can access to any dirctories in Windows by changing the first path, i.e.
the 'Downloads' folder in Windows have a Windows path

```
C:\User\<Username>\Downloads
```

in Linux command, you can go to this Windows 'Downloads' folder by

```
cd /mnt/c/User/<Userame>/Downloads
```

3) Windows Terminal (optinal)

For those who want another version of console, we suggest to install Windows terminal which can be installed from Windows Store:

> **Windows Terminal**

Here you can finalise Linux console interfaces. More options can be found online at **Windows Terminal Documentation**

4) Anaconda distribution

- To download Anaconda package, run one of these 2 commands in the Linux console:

  > For full version of **Anaconda**:
  > ```
  > wget https://repo.anaconda.com/archive/Anaconda3-2021.05-Linux-x86_64.sh
  > ```
  >
  > For **Miniconda**, which is smaller but lack of some tools that can be installed later if needed **(Recommended)**:
  > ```
  > wget https://repo.anaconda.com/miniconda/Miniconda3-py39_4.9.2-Linux-x86_64.sh
  > ```

- To install Anaconda, run:

  ```
  bash <filename>.sh
  ```
  'filename' depends on which version of Anaconda you have downloaded.

  - press any button until it prompts 'yes' or 'no', type 'yes' and press enter

- Check the installation by:

  ```
  conda list
  ```
  It will show packages that are currently installed.

5) Anaconda environment

We have prepared the required libraries for this tutorial, please download the required files from this link: **TCAP-2021**

1) Download the file `lib.txt` and put it in the directory

- paste the file in home directory, e.g. `cd <file_directory> ~` where 'file_directory' is the location where lib.txt has been downloaded, for example if it is in the Windows 'Downloads' folder: `/mnt/c/User/<username>/Downloads`
  - To create the environment, run:

    ```
    conda create --name myenv --file lib.txt
    ```
    will create the environment name 'myenv' with the required libraries.

  - Activate the environment every time before use by:

    ```
    conda activate myenv
    ```

- There will be the name of the environment in front of command line, i.e. `(myenv) user@computer-name:~$`

2) Add new calibration database

- Download the 'pord3b-v2' zip file from CTA website by this command:

  ```
  wget https://www.cta-observatory.org/wp-content/uploads/2019/04/CTA-Performance-prod3b-v2-FITS.tar.gz
  ```
  Then extract the zip file by this command:
  ```
  tar -xf CTA-Performance-prod3b-v2-FITS.tar.gz -C $CTOOLS/share/
  ```

If you have any problem you can do it this way with the folder in Google drive

- Download the whole folder 'prod3b-v2'
- Change to cladb directory

  ```
  cd $CTOOLS/share/caldb/data/cta/
  ```

- Copy the downloaded folder to this directory by this command:

  ```
  cp -r <folder_directory> ./
  ```

- in caldb directory, there will be 2 folder. See it using `ls`