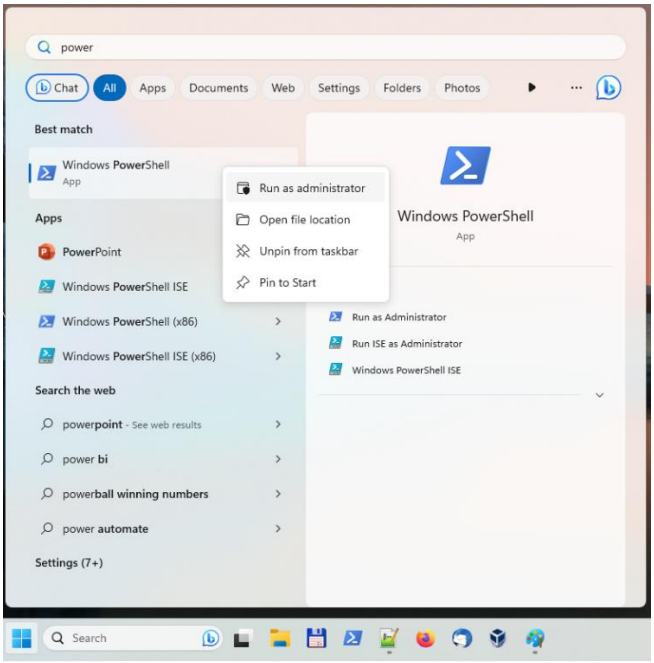
Installation guide for OpenMC and JupyterLab environment

In the followings, detailed list of instructions are provided for Windows 10 and 11 users to help with the installation process.

I. Install WSL 2 (Windows Subsystem for Linux)

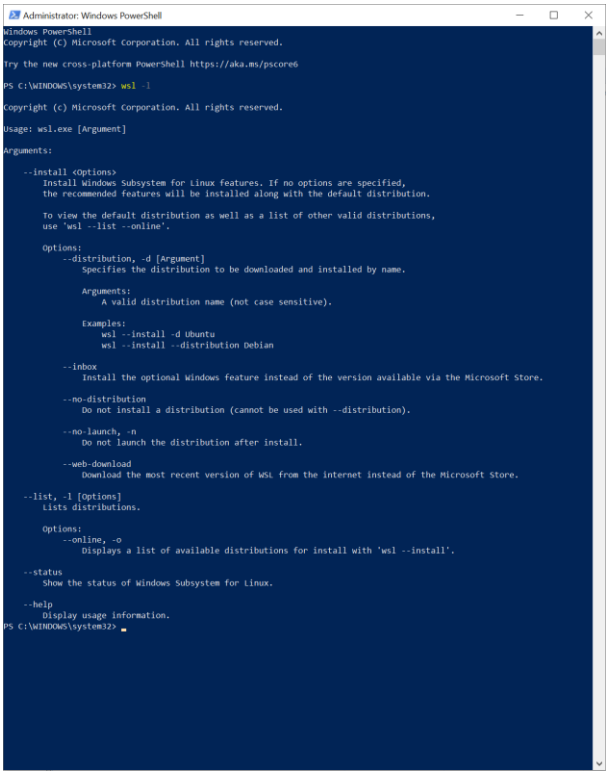
1) Open powershell in administrator mode



2) Check if wsl is installed by entering the following command

```
PS C:\> wsl -l -v
```

If the output is a help text (similar to the figure on the right), you need to install it.



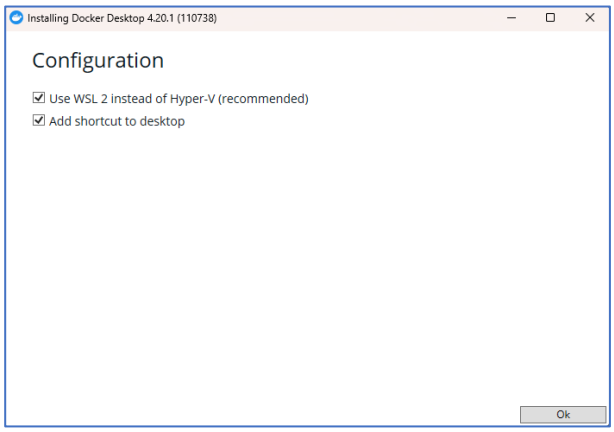
3) Install WSL2 by entering the following command:

```
PS C:\> wsl --install -n
```

4) Restart the computer.

II. Install Docker Desktop application

1) Downlad the latest installer from: https://www.docker.com/products/docker-desktop/
2) Follow the installation steps with default settings



3) Restart the computer.
4) Open powershell and check the wsl databases:

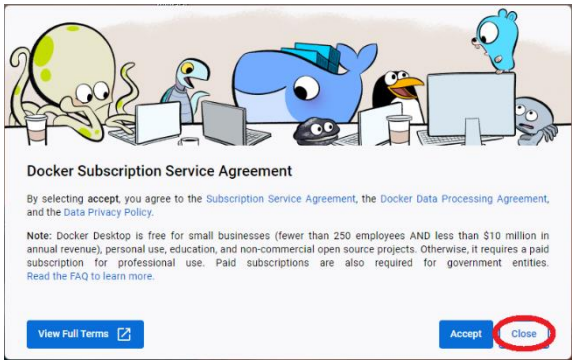
```
PS C:\> wsl -l -v
  NAME                   STATE           VERSION
* docker-desktop-data    Stopped         2
  docker-desktop         Stopped         2
  Ubuntu                 Stopped         2
PS C:\>
```

Here:

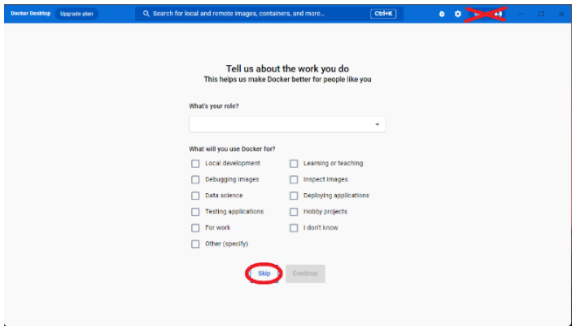
- Both „docker-desktop” and „docker-desktop-data” should be listed
- The default (*) distribution should be either of these two. If that is not the case, use the following command:

```
PS C:\> wsl --setdefault docker-desktop-data
```

5) When you start the application, you may
   a. close the subscription window

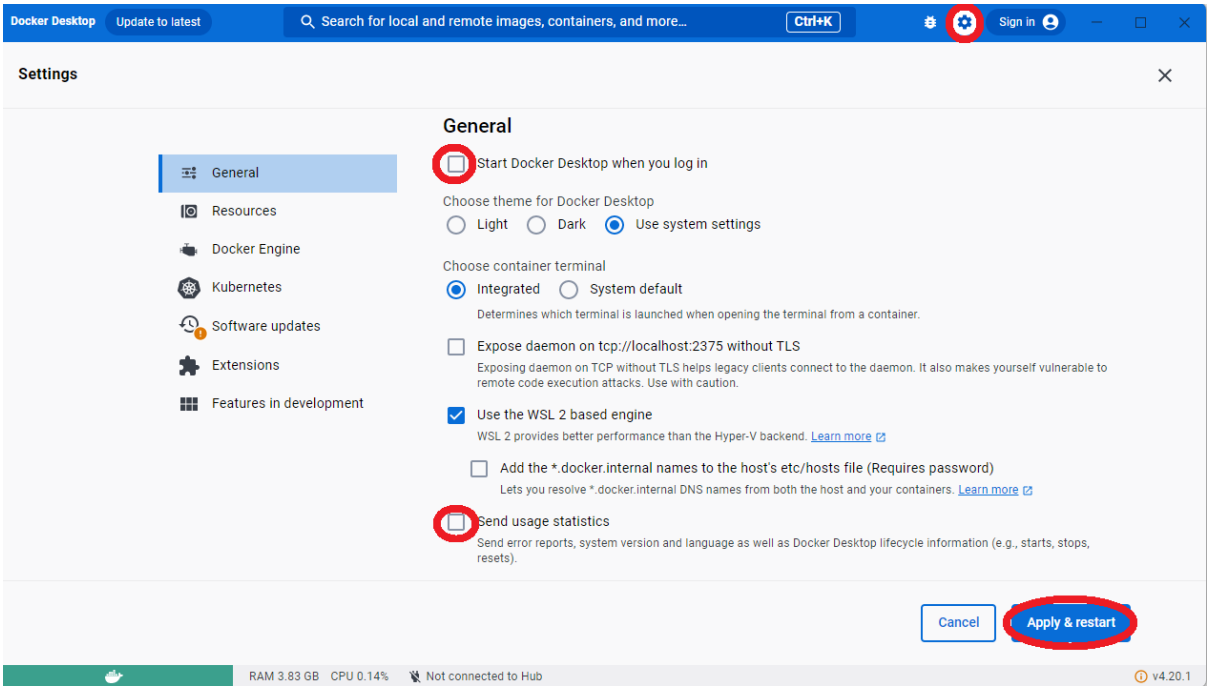


   b. skip the survey

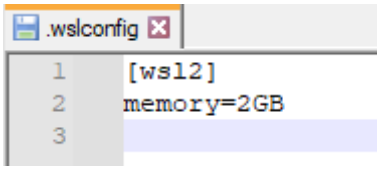


None of these, or the account feature are required to use the application.

6) Click on the gear icon to access the settings, and unmark the automatic startup and the statistics options, then click on the „Apply & Restart” button



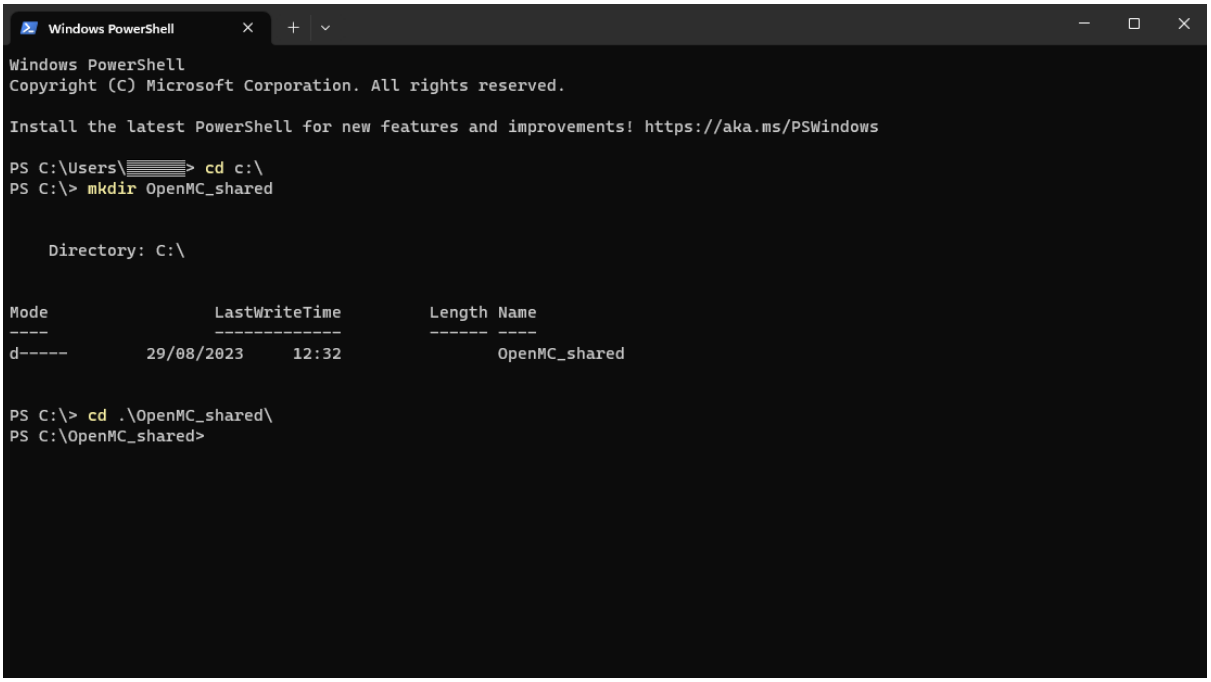
7) **OPTIONAL**, IF your computer has less than ~12 GB memory:
Download and extract wslconfig.zip, then navigate to the `%UserProfile%` direcory and copy the `.wslconfig` file into it (or modify the contents accordingly if it already exists).



8) **OPTIONAL**, IF you have less than ~20 GB free space on `C:\`:
Follow the instructions on this external site to relocate the database.

III. Installing OpenMC with JupyterLab environment using docker and setting up a shared folder with the host system

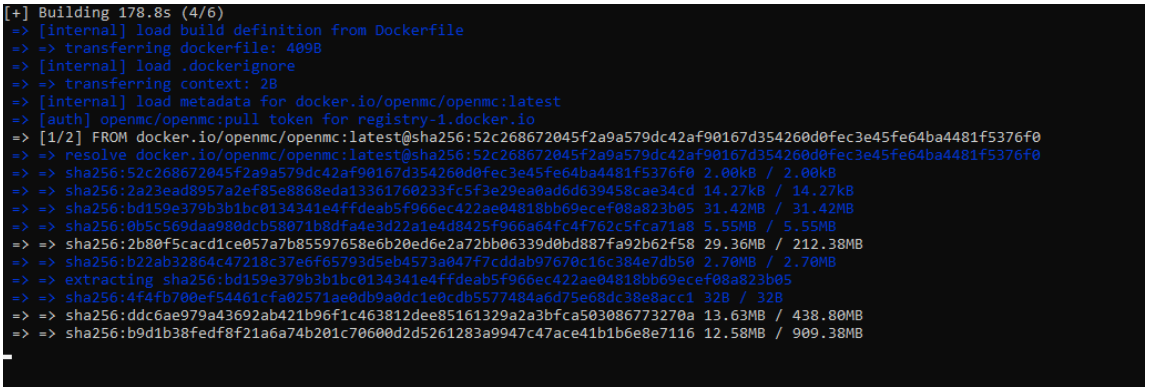
1) Open PowerShell
2) Create a folder on the host system that will be shared with the container:
   Mind that directory names are case-sensitive!



3) Download and extract Dockerfile.zip, then copy `Dockerfile` into `C:\OpenMC_shared`

4) Run the following command to install the container:
   `docker build -t openmc_with_jupyter .`
   (Mind that there is a „.” at the end!)
   IF it cries that it cannot find the `Dockerfile` (possible issue if the wsl database was moved to another drive), use this command instead:
   `docker build -t openmc_with_jupyter C:\OpenMC_shared\`

   If everything is okay, installation starts:



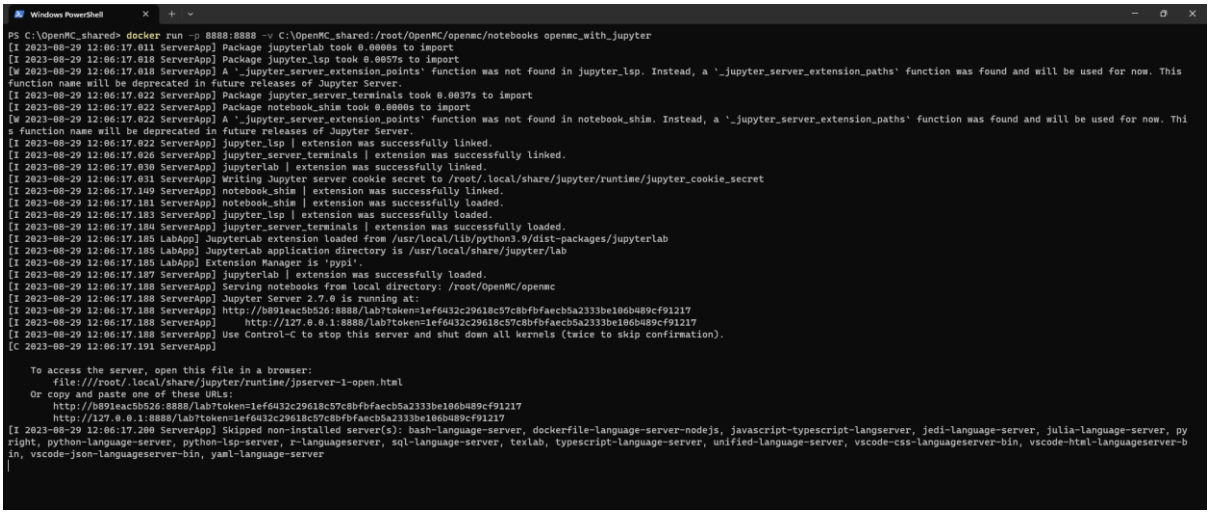
(IF at any point you encounter the following error, open/restart the Docker Desktop application to start the docker service:

```
ERROR: error during connect: this error may indicate that the docker daemon is not running: Get "http://%2F%2F.%2Fpipe%2
Fdocker_engine/_ping": open //./pipe/docker_engine: The system cannot find the file specified.
```

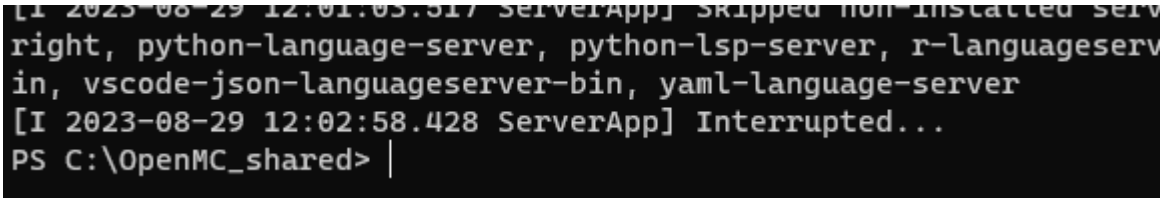
)

5) After the installation, start the container using the following commad:

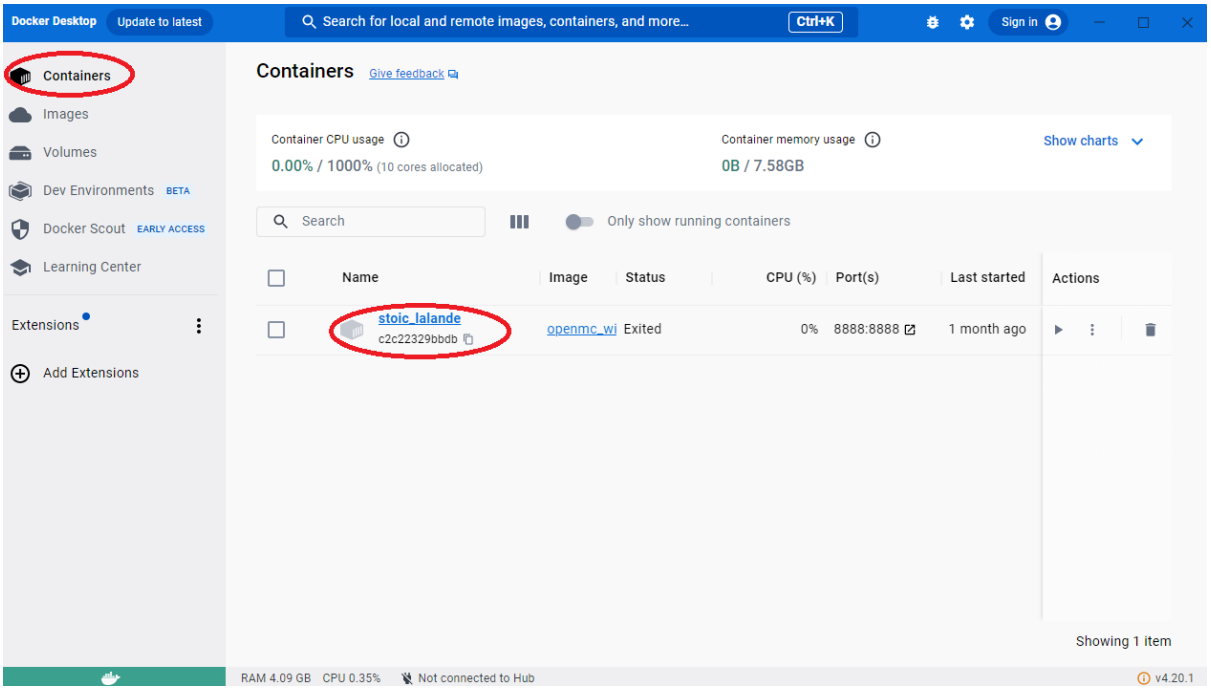
```
docker run -p 8888:8888 -v C:\OpenMC_shared:/root/OpenMC/openmc/notebooks openmc_with_jupyter
```



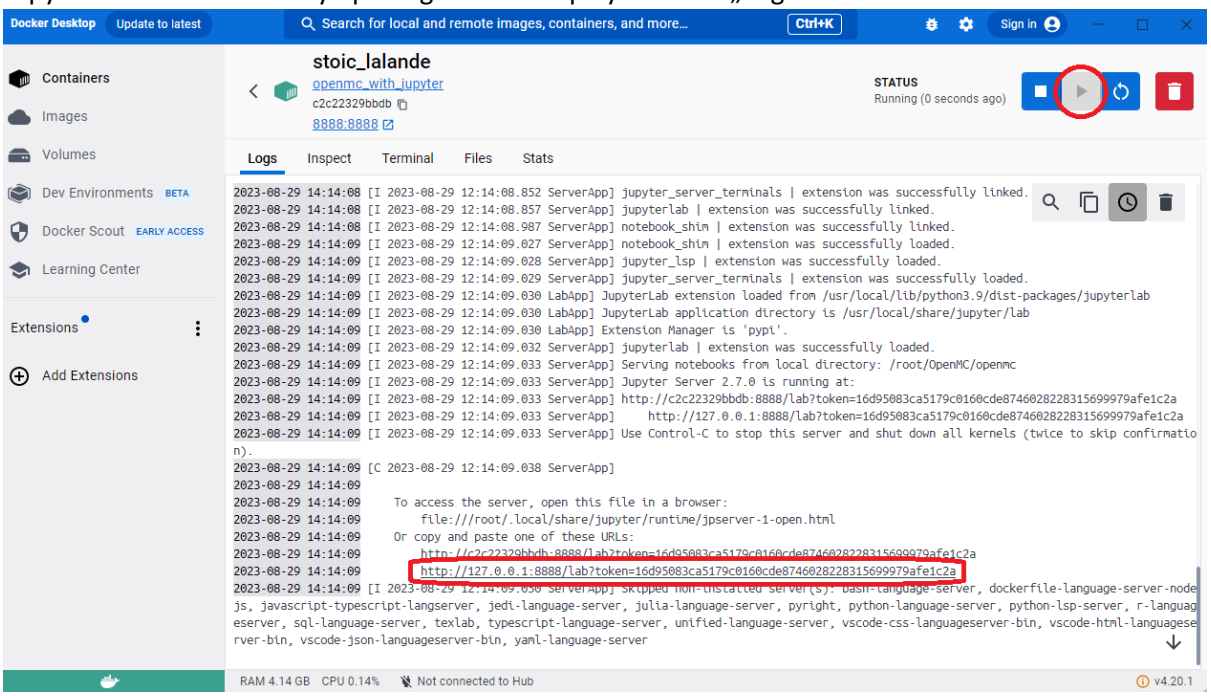
Then, when no new lines are appearing for a while, hit CTRL+C combination to interrupt.



6) Open Docker Desktop application, open the „Containers” tab, and click on the name of the container:



7) You can start the container with the „play” button in the top right section, and you can access the JupyterLab environment by opening the link displayed in the „Logs” tab:



8) Inside the JupyterLab environment, you can:
   a. Upload files to the current folder with the arrow button
   b. Find the contents of the shared folder `C:\OpenMC_shared` at `/notebooks/`
   (Mind that in the event of deleting the container, anything that is placed elsewhere will be lost.)