Setting Up a Mojo Development Environment

This guide provides step-by-step instructions to download, install, and set up a Mojo development environment in **WSL2** (Windows Subsystem for Linux). It also includes instructions on how to activate and deactivate the environment.

Prerequisites

Before starting, ensure you have the following:

1. **Windows 11** with WSL2 installed.
2. **Ubuntu (22.04 recommended)** running in WSL2.
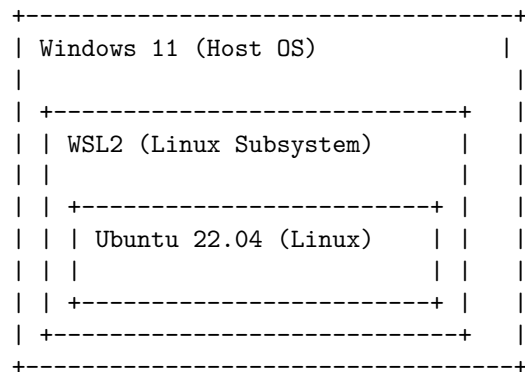3. **Internet Access**.

Steps to Set Up the Mojo Environment

1. Install WSL2 and Update Ubuntu

Ensure WSL2 and Ubuntu are installed and up to date:

```
sudo apt update && sudo apt upgrade -y
```

Diagram: System Overview

```
+----------------------------------+
| Windows 11 (Host OS)             |
|                                  |
| +------------------------------+ |
| | WSL2 (Linux Subsystem)       | |
| |                              | |
| | +------------------------+ | |
| | | Ubuntu 22.04 (Linux)   | | |
| | |                        | | |
| | +------------------------+ | |
| +------------------------------+ |
+----------------------------------+
```

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2. Install Miniconda

Miniconda is used to manage the Mojo environment.

Download and Install Miniconda

1. Download the Miniconda installer:

```
wget https://repo.anaconda.com/miniconda/Miniconda3-latest-Linux-x86_64.sh
```

2. Run the installer:

```
bash Miniconda3-latest-Linux-x86_64.sh
```

3. Follow the prompts:

   - Accept the license by typing `yes`.
   - Confirm the installation directory (recommended: `/home/<username>/miniconda3`).
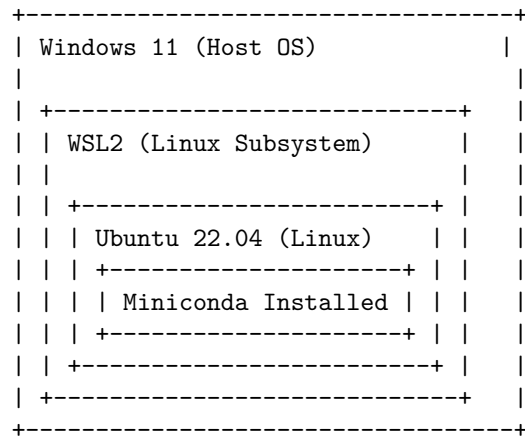   - Do not enable auto-activation unless desired.

4. Add Miniconda to your PATH:

```
export PATH=~/miniconda3/bin:$PATH
```

5. Verify the installation:

```
conda --version
```

Diagram: WSL2 with Miniconda Installed

```
+---------------------------------+
| Windows 11 (Host OS)            |
|                                 |
| +-----------------------------+ |
| | WSL2 (Linux Subsystem)      | |
| |                             | |
| | +-------------------------+ | |
| | | Ubuntu 22.04 (Linux)    | | |
| | | +---------------------+ | | |
| | | | Miniconda Installed | | | |
| | | +---------------------+ | | |
| | +-------------------------+ | |
| +-----------------------------+ |
+---------------------------------+
```

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3. Set Up the Mojo Environment

Add Required Channels

1. Configure Conda to use the necessary repositories:

```
conda config --add channels conda-forge
conda config --add channels https://conda.modular.com/max-nightly
```

Create a Mojo Environment

2. Create a Conda environment for Mojo:

```
conda create -n mojo-env max -y
```
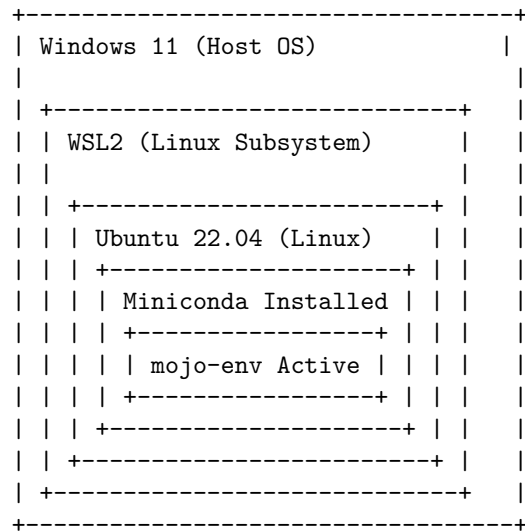
3. Activate the Mojo environment:

```
conda activate mojo-env
```

4. Verify the `magic` CLI is installed:

```
magic --version
```

- You should see the version number, confirming a successful setup.

Diagram: Conda Environment for Mojo

```
+---------------------------------+
| Windows 11 (Host OS)            |
|                                 |
| +-----------------------------+   |
| | WSL2 (Linux Subsystem)      |   |
| |                             |   |
| | +------------------------+ |   |
| | | Ubuntu 22.04 (Linux)   | |   |
| | | +--------------------+ | |   |
| | | | Miniconda Installed | | |   |
| | | | +-----------------+ | | |   |
| | | | | mojo-env Active | | | |   |
| | | | +-----------------+ | | |   |
| | | +--------------------+ | |   |
| | +------------------------+ |   |
| +-----------------------------+   |
+---------------------------------+
```

Using the Mojo Environment

Activate the Environment

To enter the Mojo environment:

```
conda activate mojo-env
```

Exit the Environment

To deactivate the Mojo environment and return to the base system:

```
conda deactivate
```

Exit WSL2

To completely leave the WSL2 environment:

```
exit
```

Additional Notes

- **Environment Isolation:** The Mojo environment is isolated from other Conda environments, ensuring dependencies do not conflict.

- **Auto-Activation:** If you want the environment to activate automatically, run:

  ```
  conda config --set auto_activate_base true
  ```

- **Uninstall Miniconda:** To completely remove Miniconda, delete its directory:

  ```
  rm -rf ~/miniconda3
  ```

This guide should help you set up and manage a reliable Mojo development environment.