# Installing WSL on Windows and Setting Up a Virtual Environment

## Step 1: Enable WSL (Windows Subsystem for Linux)

1. Open **PowerShell** as Administrator and run:

   ```
   wsl --install
   ```

   This installs WSL with Ubuntu as the default distribution.

2. Restart your computer if prompted.
3. Verify installation by running:

   ```
   wsl --list --verbose
   ```

   This should show your installed distributions.

If WSL is already installed but not updated, update it with:

```
wsl --update
```

## Step 2: Install Ubuntu Distribution

1. Open **Microsoft Store** and search for **Ubuntu**.
2. Click **Install** on your preferred version (Ubuntu 20.04, 22.04, etc.).
3. Once installed, open Ubuntu and complete the initial setup (username and password).

## Step 3: Install Python and Virtual Environment Tools

1. Update package lists:

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

2. Install Python and virtual environment tools:

```
sudo apt install -y python3 python3-venv python3-pip
```

3. Verify Python installation:

```
python3 --version
```

## Step 4: Create and Activate a Virtual Environment

1. Navigate to your project directory or create a new one:

```
mkdir my_project && cd my_project
```

2. Create a virtual environment:

```
python3 -m venv venv
```

3. Activate the virtual environment:

```
source venv/bin/activate
```

Your terminal should now show `(venv)` before the command prompt.

## Step 5: Install Packages from `requirements.txt`

1. Ensure you have a `requirements.txt` file in your project directory.
2. Install dependencies:

```
pip install -r requirements.txt
```

3. Verify installed packages:

```
pip list
```

## Step 6: Deactivating and Reactivating the Virtual

## Environment

- To deactivate the virtual environment, run:

  ```
  deactivate
  ```

- To reactivate later, navigate to the project folder and run:

  ```
  source venv/bin/activate
  ```

## Conclusion

You have successfully installed WSL, set up Ubuntu, created a virtual environment, and installed dependencies from `requirements.txt`. You can now start developing in your WSL environment!