

# Windows Setup Guide: Virtual Environment and Dependencies

QUANTT — Pairs Trading Project (Stage 1)

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## Purpose

This guide shows how to create and activate a Python virtual environment on **Windows** and install all required libraries for the project. It assumes Python 3.10+ is installed and available on your PATH (i.e., running `python --version` works).

## 1 Create and Activate a Virtual Environment (Windows)

Open **PowerShell** or **Command Prompt** and run:

### 1. Navigate to your project folder

```
cd path\to\QUANTT-PairsTrading
```

### 2. Create the virtual environment

```
python -m venv .venv
```

### 3. Activate the environment

Choose one based on your shell:

**PowerShell:**

```
.venv\Scripts\Activate.ps1
```

Command Prompt (cmd.exe):

```
.venv\Scripts\activate.bat
```

(Reference for macOS/Linux users in the team):

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

After activation, your prompt should start with (.venv):

```
(.venv) C:\Users\You\QUANTT-PairsTrading>
```

## 2 Upgrade pip (Recommended)

Keeping pip current avoids many install issues:

```
pip install --upgrade pip
```

## 3 Install Project Dependencies

Ensure your repository has a requirements.txt at the project root. Then run:

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

### Typical contents of requirements.txt

(Already prepared for this project; shown here for reference.)

```
numpy
pandas
scipy
statsmodels
scikit-learn
yfinance
backtesting
matplotlib
seaborn
plotly
streamlit
tqdm
```

```
python-dotenv
arch
pyarrow
joblib
pytest
black
```

## 4 Verify Installation

Quick import test to confirm the environment works:

```
python - << PY
import numpy as np
import pandas as pd
import statsmodels.api as sm
import yfinance as yf
import matplotlib.pyplot as plt
import seaborn as sns
print(    All core imports successful. )
PY
```

## 5 (Optional) Freeze Exact Versions

Create a locked snapshot for reproducibility (useful for teammates):

```
pip freeze > requirements_locked.txt
```

## 6 Common Troubleshooting

- Execution policy blocks Activate.ps1 (PowerShell):

```
Set-ExecutionPolicy -Scope CurrentUser RemoteSigned
# Then try:
.venv\Scripts\Activate.ps1
```

- Wrong Python used to create venv: check version:

```
python --version
where python
```

If multiple Pythons are installed, use their full path:

```
C:\Path\To\Python\python.exe -m venv .venv
```

- **Command not found after activation:** make sure you see `(.venv)` in the prompt. If not, re-run the correct activation command for your shell.
- **Package installation fails:** upgrade `pip` and retry:

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

## 7 Deactivating the Environment

When you're done:

```
deactivate
```

## Done

Your Windows development environment is ready for the QUANTT pairs trading project. Share this file with teammates to keep everyone consistent.