ATOC: macOS Setup Sheet (VS Code + Conda/Mamba)

What you are installing

- **Visual Studio Code (VS Code)**: the editor you will write code in.
- **Apple Command Line Tools**: provides **git** and other developer tools.
- **Conda + Mamba (via Miniforge)**: installs Python and scientific packages in an isolated environment.

Before you start (2 minute checklist)

1. You should be on macOS 11+ (newer is fine).
2. Close VS Code if it is currently open.
3. Know whether you have **Apple Silicon** (M1/M2/M3) or **Intel**.
   - Click the Apple menu → **About This Mac**.

Step 1: Install VS Code on macOS

1. Go to the official download page: https://code.visualstudio.com/download
2. Download the **macOS** version.
3. If your download is a `.zip`, double-click it to extract.
4. Drag `Visual Studio Code.app` into your **Applications** folder.
5. Open VS Code from **Applications**.
6. If macOS asks whether you want to open it, choose **Open**.

Optional but helpful: enable the `code` command

This lets you type `code .` to open VS Code in the current folder.

1. In VS Code, open the Command Palette: **Cmd+Shift+P**
2. Type `shell command` and run:
   `Shell Command: Install 'code' command in PATH`
3. Close and re-open your Terminal app so PATH updates.
4. Test:

```
code --version
```

Step 2: Install Apple Command Line Tools (this gives you git)

1. Open the **Terminal** app (Applications → Utilities → Terminal).
2. Run:

```
xcode-select --install
```

3. A popup appears. Click **Install** and wait.

4. Verify git works:

```
git --version
```

Step 3: Install Conda + Mamba (recommended: Miniforge)

Miniforge is a lightweight conda installer and includes `mamba`.

Option A (easiest): Download Miniforge from conda-forge

1. Go to: https://conda-forge.org/download/
2. Download the Miniforge installer for:
   - **macOS arm64** (Apple Silicon M1/M2/M3), or
   - **macOS x86_64** (Intel)
3. Follow the instructions on that page for macOS installation.

Option B (reliable): Install Miniforge from Terminal (copy/paste)

1. In **Terminal**, choose a folder like Downloads:

```
cd ~/Downloads
```

2. Download the installer (this command picks the right Mac type automatically):

```
curl -L -O "https://github.com/conda-forge/miniforge/releases/latest/download/Miniforge3-$(uname)-$(u
```

3. Run the installer:

```
bash Miniforge3-$(uname)-$(uname -m).sh
```

4. Press Enter to scroll, then type `yes` to accept the license when prompted.
5. Accept the default install location unless your instructor says otherwise.

Step 4: Initialize conda for your shell (zsh on most Macs)

After installing, you want `conda activate` to work in Terminal.

1. Close Terminal and open it again.
2. Run:

```
conda init zsh
```

3. Close Terminal and open it again (yes, again).
4. Verify:

```
conda --version
mamba --version
```

If you use bash (older Macs or custom setup):

```
conda init bash
```

Step 5: Install required VS Code extensions

Install these extension IDs:

```
ms-python.python
ms-python.vscode-pylance
ms-toolsai.jupyter
ruff
yzhang.markdown-all-in-one
```

Option A (recommended): Extensions tab

1. In VS Code, open Extensions: **Cmd+Shift+X**
2. Search each ID above and click **Install**.

Option B: Command line (requires the `code` command enabled)

```
code --install-extension ms-python.python
code --install-extension ms-python.vscode-pylance
code --install-extension ms-toolsai.jupyter
code --install-extension ruff
code --install-extension yzhang.markdown-all-in-one
```

Step 6: Create the class Python environment using Mamba

Goal command:

```
mamba env create -f atoc-2025-lite.yml
```

1. Get `atoc-2025-lite.yml` from your course site (`CANVAS FILES/Class Env/atoc-2025-lite.yml`).
2. Put it in a folder you can find (example: `/Desktop/atoc`).
3. In Terminal, go to that folder (example):

   ```
   cd ~/Desktop/atoc
   ```

4. Create the environment:

   ```
   mamba env create -f atoc-2025-lite.yml -vv
   ```

5. List environments:

   ```
   conda env list
   ```

6. Activate the new environment (use the name shown by `conda env list`):

   ```
   conda activate atoc-2025-lite
   ```

7. Quick test:

   ```
   python --version
   python -c "import numpy as np; print(np.arange(5))"
   ```

Step 7: Tell VS Code to use your new environment

1. Open VS Code and open your class folder (**File** → **Open**).
2. Open the Command Palette: **Cmd+Shift+P**
3. Run: `Python: Select Interpreter`
4. Choose the interpreter that includes your environment name.
5. If you open a Jupyter notebook, pick the same environment as the kernel.

Common problems (fast fixes)

- **"conda: command not found"**:
  - Re-run `conda init zsh`, then close and re-open Terminal.
- **"mamba: command not found"**:
  - You may have installed a conda distribution without mamba. In that case:

    ```
    conda install -n base -c conda-forge mamba
    ```
- **Jupyter cannot find a kernel**:
  - Activate your environment, then:

    ```
    mamba install ipykernel jupyter
    ```

Tip: When asking for help, include the exact command you ran and the full error text.