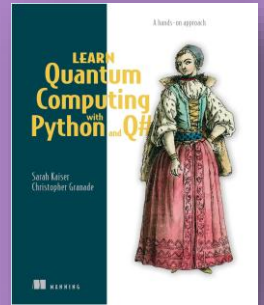
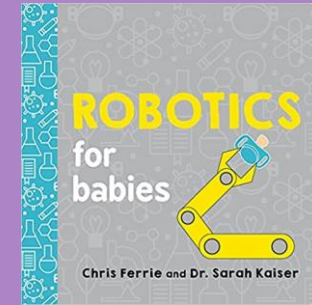
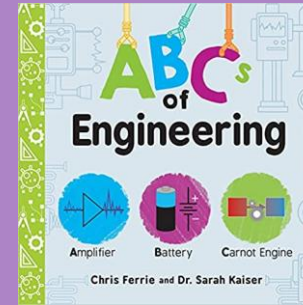
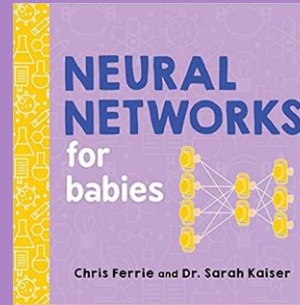


Eternal sunshine of the spotless development environment

Sarah Kaiser (she/they)
Sr. Developer Advocate @ Microsoft

Hiya! 🖐️



- 🐕 Chewie kibble delivery
- 📖 Author of books for all ages
- 🗡️ Plays anything Final Fantasy
- 🚢 Usually floating near Seattle

Eloisa to Abelard | Alexander Pope 1717



Abelard and his pupil Heloise by Edmund Leighton, 1882

Love letters to be remembered...

How happy is the blameless Vestal's lot!

The world forgetting, by the world forgot:

Eternal sunshine of the spotless mind!

Each prayer accepted, and each wish resign'd;

Labour and rest, that equal periods keep;

'Obedient slumbers that can wake and weep;'

Desires composed, affections ever even;

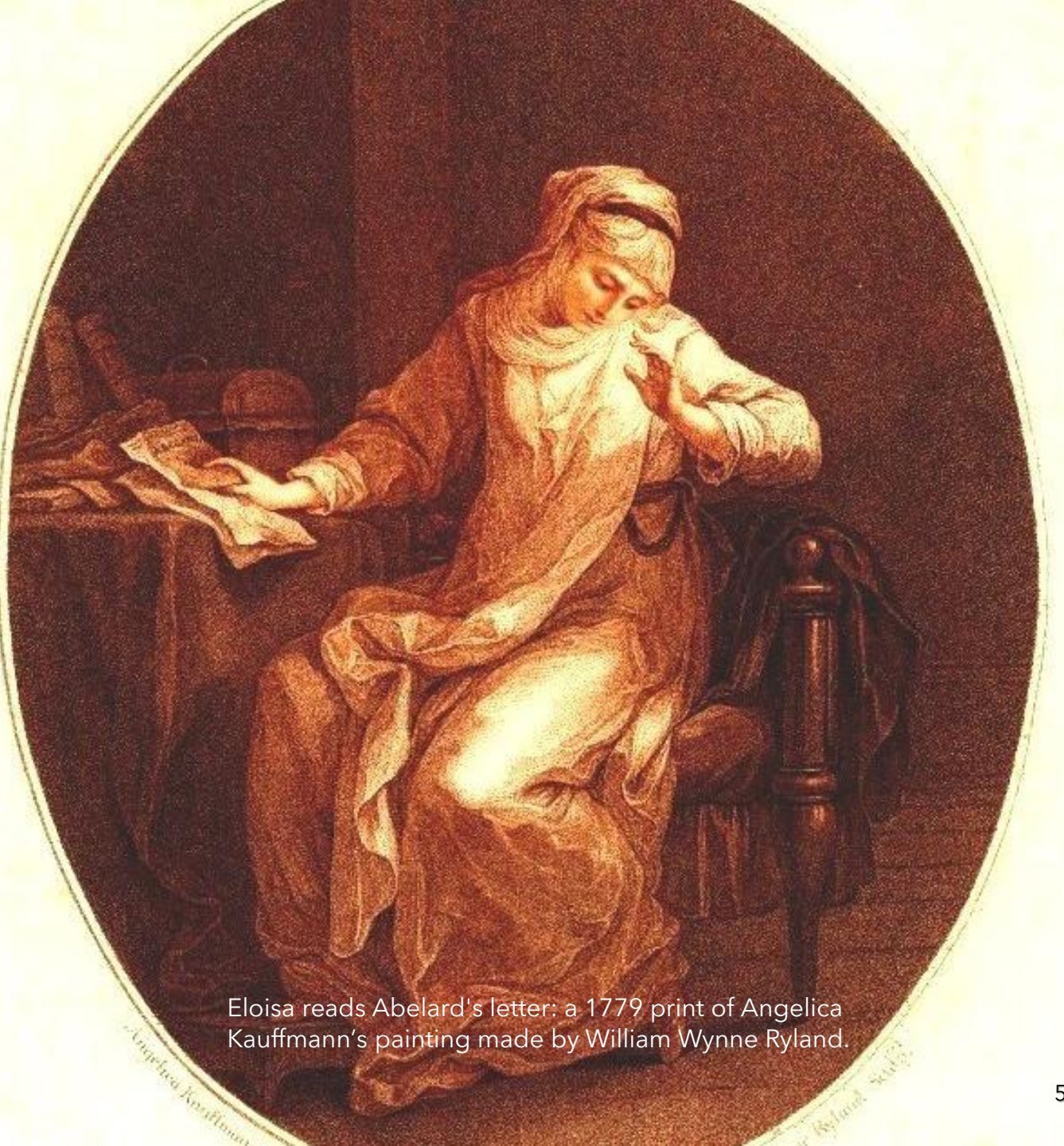
Tears that delight, and sighs that waft to heaven.

**What do
you *least*
love to hear
when
coding?**

**please
comment/shout some
out!**



**“It doesn't
work on
my
machine”**



Eloisa reads Abelard's letter: a 1779 print of Angelica Kauffmann's painting made by William Wynne Ryland.

Plan



What are Dev Containers?



Dev Containers for collaboration + OSS contribution



Teaching with Dev Containers

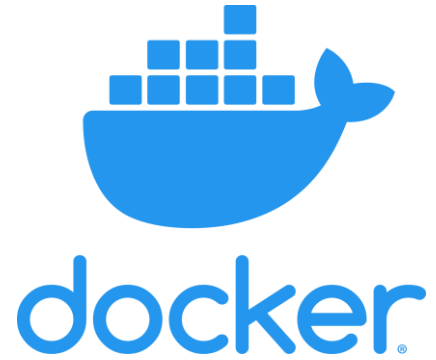


Wrap-up

Questions are great! 🌟💖 Come find me after to chat more!

Desires composed, affections ever even

Dev Containers?



- Separate code from how it gets run
- Host containers wherever you need
- Easier to scale projects

tl;dr
containers
for code

Dev Containers:

Specify an environment for your code and how you work with it

containers.dev

Development Containers

Overview

Reference

Specification

Supporting Tools

Guides

Available Features

Available Templates

Collections

Development Containers

An open specification for enriching containers with development specific content and settings.

☆ Star 1,143

What are Development Containers?

A Development Container (or Dev Container for short) allows you to use a container as a full-featured development environment. It can be used to run an application, to separate tools, libraries, or runtimes needed for working with a codebase, and to aid in continuous integration and testing. Dev containers can be run locally or remotely, in a private or public cloud.

The Development Containers Specification seeks to find ways to enrich existing formats with common development specific settings, tools, and configuration while still providing a simplified, un-orchestrated single container option – so that they can be used as coding environments or for continuous integration and testing. Beyond the specification's core metadata, the spec also enables developers to quickly share and reuse container setup steps through [Dev Container Features](#) and [Templates](#).

```
1 {
2   "name": "Go",
3   "build": {
4     "dockerfile": "Dockerfile",
5     "args": {
6       // Update the VARIANT arg to pick a version of Go: 1.15, 1.17
7       // Append -bullseye or -buster to pin to an OS version.
8       // Use -bullseye variants on local arm64 Apple Silicon.
9       "VARIANT": "1-bullseye",
10      // Options
11      "NODE_VERSION": "lts/*"
12    }
13  },
14  "runArgs": [ "--cap-add=SYS_PTRACE", "--security-opt", "seccomp=unconfined" ],
15
16  // Configure tool-specific properties.
17  "customizations": {
18    // Configure properties specific to VS Code.
19    "vscode": {
20      // Set *default* container specific settings.json values on container create.
21      "settings": {
22        "go.toolsManagement.checkForUpdates": "local",
23        "go.useLanguageServer": true,
24        "go.gopath": "/go"
25      },
26
27      // Add the IDs of extensions you want installed when the container is created.
28      "extensions": [
29        "golang.go"
30      ]
31    }
32  },
33 }
```

Use or create dev container definitions for a multitude of tech stacks and tools.



Overview

More information about the Development Containers Specification.



Specification

Check out the latest reference implementation and schemas.



Supporting Tools

A variety of tools and services support this standard.

Layouts, settings, themes, oh my!

A screenshot of the Visual Studio Code interface with the Dracula Official theme. The Explorer sidebar on the left shows a project named 'PYCON-DEVCONTAINERS' with a subfolder '.devcontainer' containing files like 'devcontainer.json', 'Dockerfile', 'noop.txt', 'CODE_OF_CONDUCT.md', 'environment.yml', 'jupyter_repos.csv', 'jupyter_repos.ipynb', 'LICENSE', 'README.md', and 'title.png'. The Outline sidebar shows the structure of 'devcontainer.json', including 'name', 'build', 'context', 'dockerfile', 'postCreateCommand', 'customizations', and 'vscode'. The main editor displays the 'devcontainer.json' file with the following content:

```
1 {
2   "name": "devcontainer_demo",
3   "build": {
4     "context": "..",
5     "dockerfile": "Dockerfile"
6   },
7
8   // Use 'postCreateCommand' to run
9   // commands after the container is
10  // created.
11  "postCreateCommand": "conda init",
12
13  // Configure tool-specific
14  // properties.
15  "customizations": {
16    "vscode": {
17      "settings": {
18        "python.defaultInterpreterPath":
19        "/opt/conda/envs/"
20      }
21    }
22  }
23 }
```

The Terminal at the bottom shows a 'pwsh' session in the 'main' branch of the 'pycon-devcontainers' repository, with a timestamp of 11:45. The status bar at the very bottom indicates 'Ln 1, Col 2', 'Tab Size: 4', 'UTF-8', 'LF', and 'JSON with Comments'.

Theme: Dracula Official | Font: Cascadia Code

Where do they run?



Local editors with Docker



Codespaces



Cloud hosting services

Start with a simple devcontainer.json

```
{  
  "name": "Python 3",  
  "image": "python:3.13-rc-bookworm"  
}
```


Parts of a devcontainer.json

Image

- Default/template
- Dockerfile
- Docker Compose

Features

- Alternative to writing custom Dockerfiles
- Large catalogue of tools/programs you can add to container with one line
- Can slow launch times

Customization

- Describe the editor/platform specific settings
- Configure extensions, themes, shortcuts, etc.
- Editor options can vary

Full reference: containers.dev/implementors/json_reference/

Add features and customizations

```
"name": "devcontainer_demo",
"build": {
  "context": "..",
  "dockerfile": "Dockerfile"
},

"features": {
  "ghcr.io/azure/azure-dev/azd:0": {}
},

"customizations": {
  "vscode": {
    "settings": {
      "python.defaultInterpreterPath": "/opt/conda/envs/devcontainer_demo"
    },
    "extensions": [
      "ms-python.python"
    ]
  }
}
```

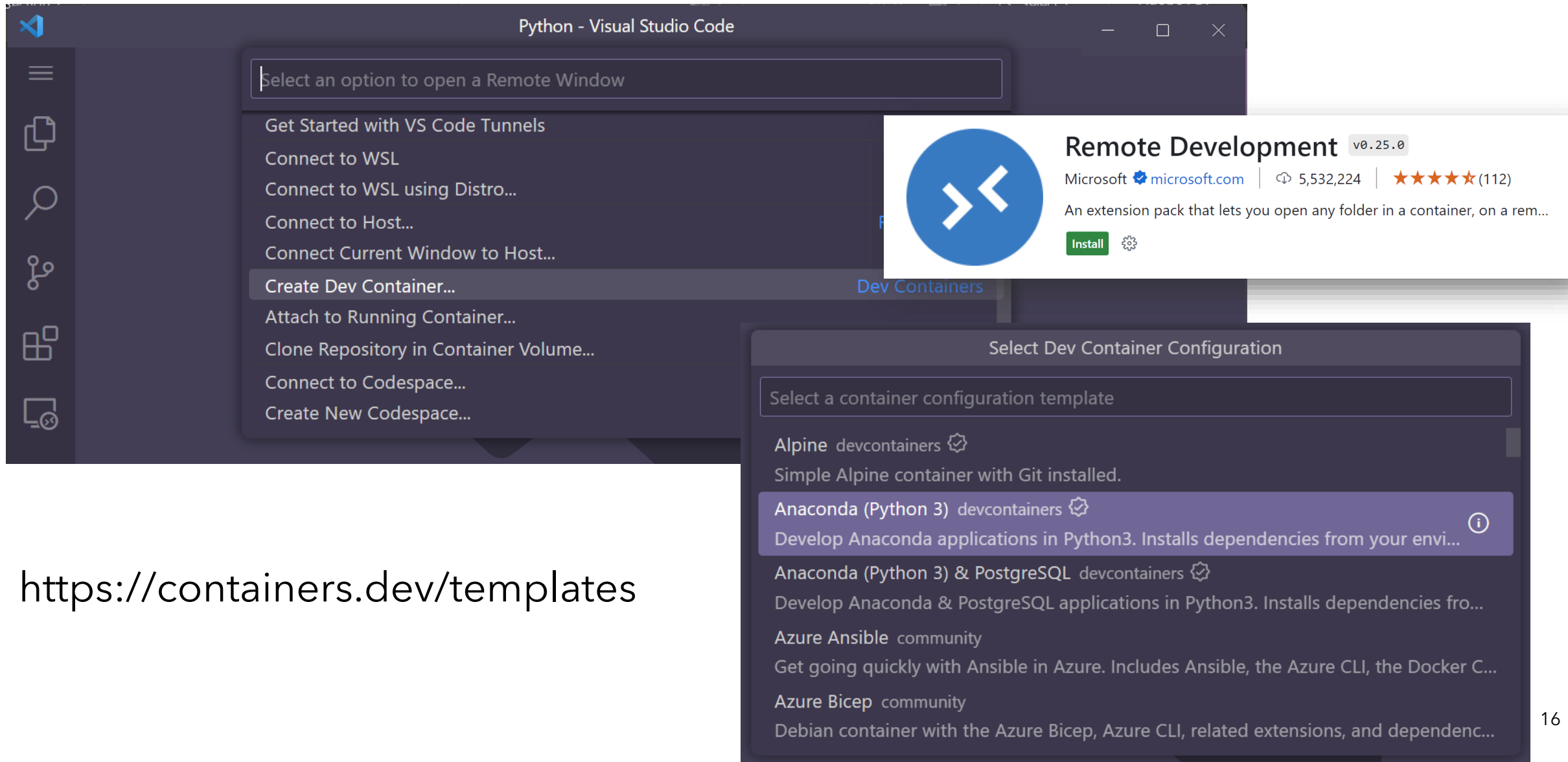
Add a Dockerfile

(or Docker Compose)

.devcontainer >  Dockerfile

```
1 FROM mcr.microsoft.com/devcontainers/miniconda:0-3
2
3 RUN conda install -n base -c conda-forge mamba
4 COPY environment.yml* .devcontainer/noop.txt /tmp/conda-tmp/
5 RUN if [ -f "/tmp/conda-tmp/environment.yml" ]; then umask
    0002 && /opt/conda/bin/mamba env create -f /tmp/conda-tmp/
    environment.yml; fi \
6 |    && rm -rf /tmp/conda-tmp
```

...or just pick a template 😄



The image shows a screenshot of the Visual Studio Code interface. The top window is titled "Python - Visual Studio Code" and displays a dropdown menu for "Select an option to open a Remote Window". The menu options are:

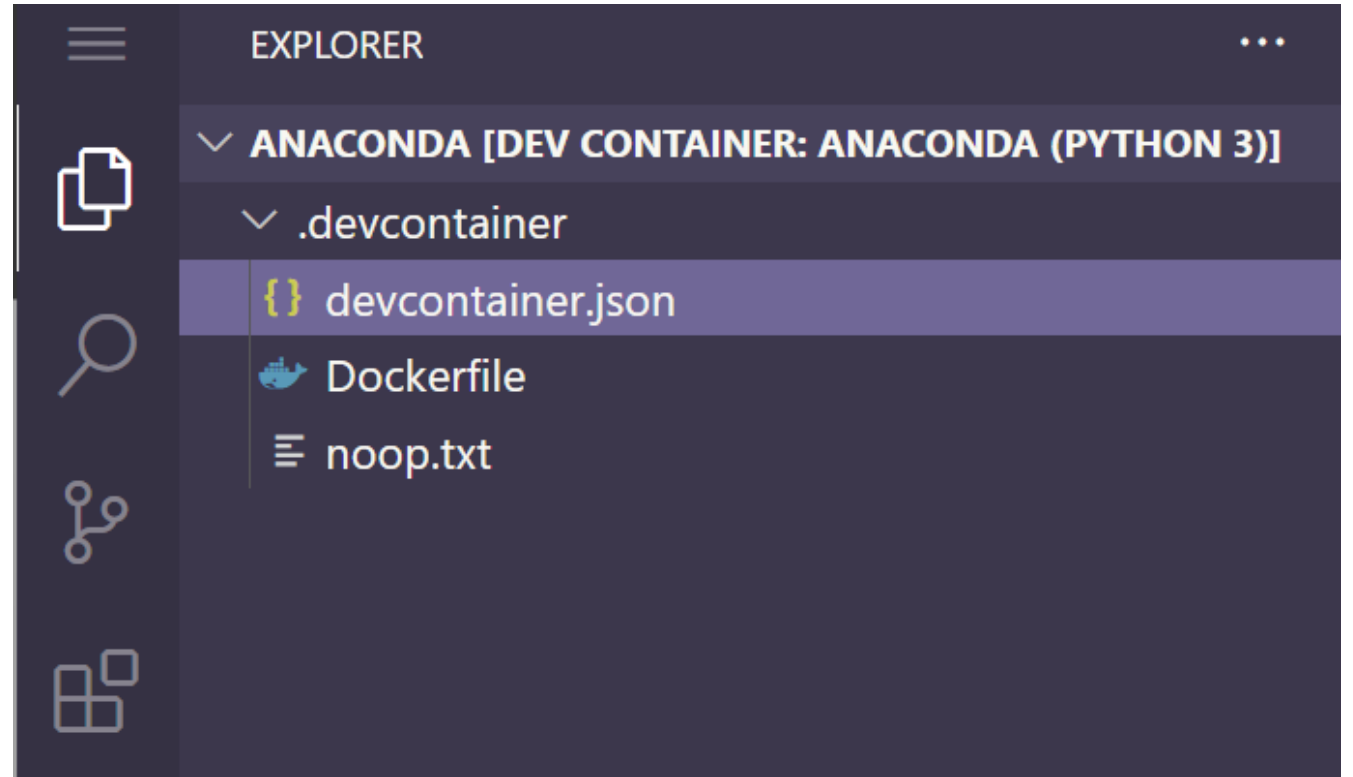
- Get Started with VS Code Tunnels
- Connect to WSL
- Connect to WSL using Distro...
- Connect to Host...
- Connect Current Window to Host...
- Create Dev Container...**
- Attach to Running Container...
- Clone Repository in Container Volume...
- Connect to Codespace...
- Create New Codespace...

Overlaid on the right is a notification for the "Remote Development" extension by Microsoft. It shows the extension's icon, name, version (v0.25.0), and a list of features. Below the notification is a dialog titled "Select Dev Container Configuration" with a search bar and a list of templates:

- Alpine devcontainers
- Anaconda (Python 3) devcontainers
- Anaconda (Python 3) & PostgreSQL devcontainers
- Azure Ansible community
- Azure Bicep community
- Debian container with the Azure Bicep, Azure CLI, related extensions, and dependenc...

<https://containers.dev/templates>

**Now you
have setup
a Dev
Container!**



Each PR accepted, and each issue closed

Example 1: Collaboration

Managing + making OSS contributions can be challenging...

The image shows a VS Code interface. The main editor displays a markdown file named `CONTRIBUTING.md` in the `main` branch. The file content includes sections on writing bug reports and feature requests, and a list of information to include in an issue. An `Outline` sidebar on the right lists the document's sections. A terminal window is open in the foreground, showing the execution of a script that failed due to a `FileNotFoundError`.

CONTRIBUTING.md Content:

Writing Good Bug Reports and Feature Requests

File a single issue per problem and feature request. Do not enumerate multiple bugs or feature requests in the same issue.

Do not add your issue as a comment to an existing issue unless it's for the identical input. Many issues look similar but have different causes.

The more information you can provide, the more likely someone will be successful at reproducing the issue and finding a fix.

The built-in tool for reporting VS Code's Help menu, can help you file an issue. In the latest version of VS Code, all your input is captured and the issue reporting tool will search among existing issues to find similar ones.

Please include the following information in your issue:

- Version of VS Code
- Your operating system


Terminal Output:

```
main
failed yesterday in 2m 43s

> ✓ Install dependencies 1m 34s
v ✗ Run Classifier: Generator 3s

1 ▶ Run python ./actions/classifier-deep/apply/generate-labels/main.py
11 Traceback (most recent call last):
12   File "./actions/classifier-deep/apply/generate-labels/main.py", line 92, in <module>
13     main()
14   File "./actions/classifier-deep/apply/generate-labels/main.py", line 72, in main
15     area_classifier = make_classifier('area', configuration.get('labels', {}), 0.70)
16   File "./actions/classifier-deep/apply/generate-labels/main.py", line 18, in
make_classifier
17     with open(os.path.join(BASE_PATH, category+'_model', 'target_names.json')) as fp:
18   FileNotFoundError: [Errno 2] No such file or directory: './actions/classifier-
deep/apply/generate-labels/./area_model/target_names.json'
19 Error: Process completed with exit code 1.
```









Try this Dev Container repro:



Cleanup script not running


Write


Preview

H B I       @  

I am testing this project and when I try to close the app, the cleanup script doesn't seem to run. Here is a [gist] (<https://gist.github.com/crazy4pi314/75a4b34f763bfdb2e56a0afa4ecec73>) with a Dev Container where you can reproduce the issue.

Thanks! ❤️

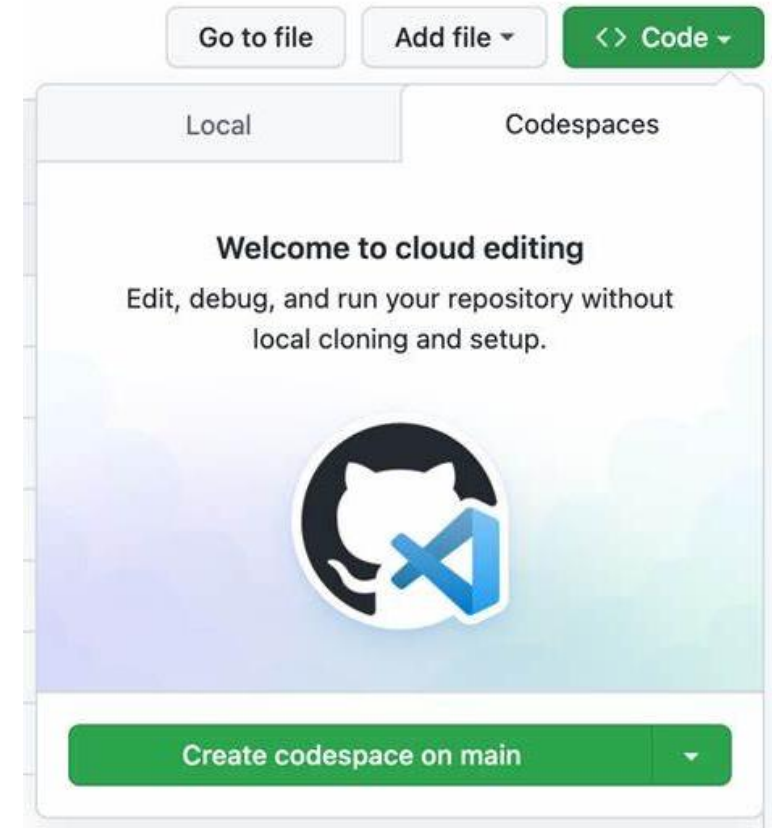
Attach files by dragging & dropping, selecting or pasting them. 

 Styling with Markdown is supported

Submit new issue

Host Dev Containers on GitHub Codespaces

- Cloud Dev Container hosting with up to 60 hours a month free.
- Supports different editors/interfaces locally and in the browser
- Work from anywhere with whatever compute power you need.



Choose the right machine for the job



Branch
This branch will be checked out on creation
main

Dev container configuration
Your codespace will use this configuration
.devcontainer/dev...

Region
Your codespace will run in the selected region
US West

Machine type
16-core • 32GB RAM • 128GB storage
Need even more power? [Contact our team](#) to enable 32-core machines.

2-core
4GB RAM • 32GB

4-core
8GB RAM • 32GB

8-core
16GB RAM • 64GB

✓ 16-core
32GB RAM • 128GB

[Terms](#) [Privacy](#) [Security](#) [Status](#)

Adds multiline quick input support #177045

<> Code ▾

🔗 Draft

eamodio wants to merge 1 commit into `microsoft:main` from `eamodio:main`

💬 Conversation 0

🔑 Commits 1

📄 Checks 2



eamodio commented 1 hour ago

Contributor



Closes [#98098](#)

This is still a work-in-progress, but it seems to basically work at this point.

/cc @TylerLeonhardt



Closes [microsoft#98098](#) adds multiline quick input support

Local

Codespaces

Codespaces

Your workspaces in the cloud



No codespaces

You don't have any codespaces with this repository checked out

Create codespace on ea...

[Learn more about codespaces...](#)

Codespace usage for this repository is paid for by microsoft

Jump right in to review PRs

Codespaces + Dev Containers

"I'll send you a link to my Dev Container!"



crazy4pi314 / Dockerfile

Created 3 months ago

Edit Delete

<> Code Revisions 1

Fast mamba containers


devcontainer.json

```
1 // For format details, see https://aka.ms/devcontainer.json. For config options, see the
2 // README at: https://github.com/devcontainers/templates/tree/main/src/anaconda
3 {
4   "name": "Fast mamba",
5   "build": {
6     "context": "..",
7     "dockerfile": "Dockerfile"
8   },
9
10  // Features to add to the dev container. More info: https://containers.dev/features.
11  // "features": {},
12
13  // Use 'forwardPorts' to make a list of ports inside the container available locally.
14  // "forwardPorts": [],
15 }
```


Unequal task! a passion to resign

Example 2: Teaching

Easy setup for instructors

**GitHub Education**

[Overview](#) [Repositories](#) [Projects](#) [Packages](#) [People](#)

Type ▾ Language ▾ Sort ▾

6 results for all repositories matching **codespaces** sorted by **last updated** ✕ Clear filter

codespaces-project-template-dotnet Public template

Codespaces template for building a .NET project

HTML MIT 13 stars 0 forks 1 watch Updated 4 days ago

codespaces-project-template-js Public template

Codespaces template for creating and deploying your own React portfolio

react javascript template portfolio JavaScript MIT 60 stars 1 fork 0 watch Updated 4 days ago


codespaces-teaching-js-template Public template

Codespaces template for teaching JavaScript

codespaces-teaching-js javascript education JavaScript MIT 9 stars 0 forks 0 watch Updated last week

codespaces-project-template-py Public template

Codespaces template for building a Python project

**devcontainers**

Official organization for the Development Containers Specification and dev container resources.

628 followers <https://containers.dev> Part of Microsoft Open Source Verified

[Overview](#) [Repositories 15](#) [Discussions](#) [Projects](#) [Packages](#) [People 9](#)

README.md

Welcome to the Development Containers Community

In this community we maintain the [Development Containers \(dev container\) Specification](#). The dev container spec defines a standard for any development tool to use a container as a full-featured development environment.

Join us to continue to make this spec and the reference CLI implementation even better! There are several ways you can chat with the spec maintainers and the community:

- Open a GitHub [Discussion](#)
- Open issues on the relevant repository in the `devcontainers` org
- Join our Slack channel! You may reply to [this Discussion](#) to get added


The dev containers specification is maintained in the [spec repo](#).


We maintain a set of [images](#) and [Features](#) as part of the specification.


You can also [create and share your own Features](#). We've created a [Features template repo](#) to help along the way.


The <https://containers.dev> site is in the [devcontainers.github.io repo](#).


Top discussions this past month


 How can I get this publish action to work?

↑ 2 ↓ 8 

 enable devcontainer up in detached mode


↑ 1 ↓ 1 

 Is there a way (or convention) for asserting constraints on a devcontain...

↑ 1 ↓ 1 

[View all discussions](#)

People



Use Pre-builds to speed up launch

*Can add some cost depending on frequency

Machine type
2-core • 4GB RAM • 32GB storage

2-core ▾

✓ 2-core 4GB RAM • 32GB	⚡ Prebuild ready
4-core 8GB RAM • 32GB	⚡ Prebuild ready
8-core 16GB RAM • 64GB	⚡ Prebuild ready
16-core 32GB RAM • 128GB	⚡ Prebuild ready
32-core 64GB RAM • 128GB	⚡ Prebuild ready

Prebuild triggers

You can specify how often to prebuild your codespace based on changes to your repository or a schedule to manage Actions usage. [Learn more](#)

☐ Every push **Default**

Your codespace will prebuild on every push to this branch

☐ On configuration change

Your codespace will prebuild when a change is detected on the devcontainer.json and associated configuration files

☒ **Scheduled**

Your codespace will prebuild on a schedule

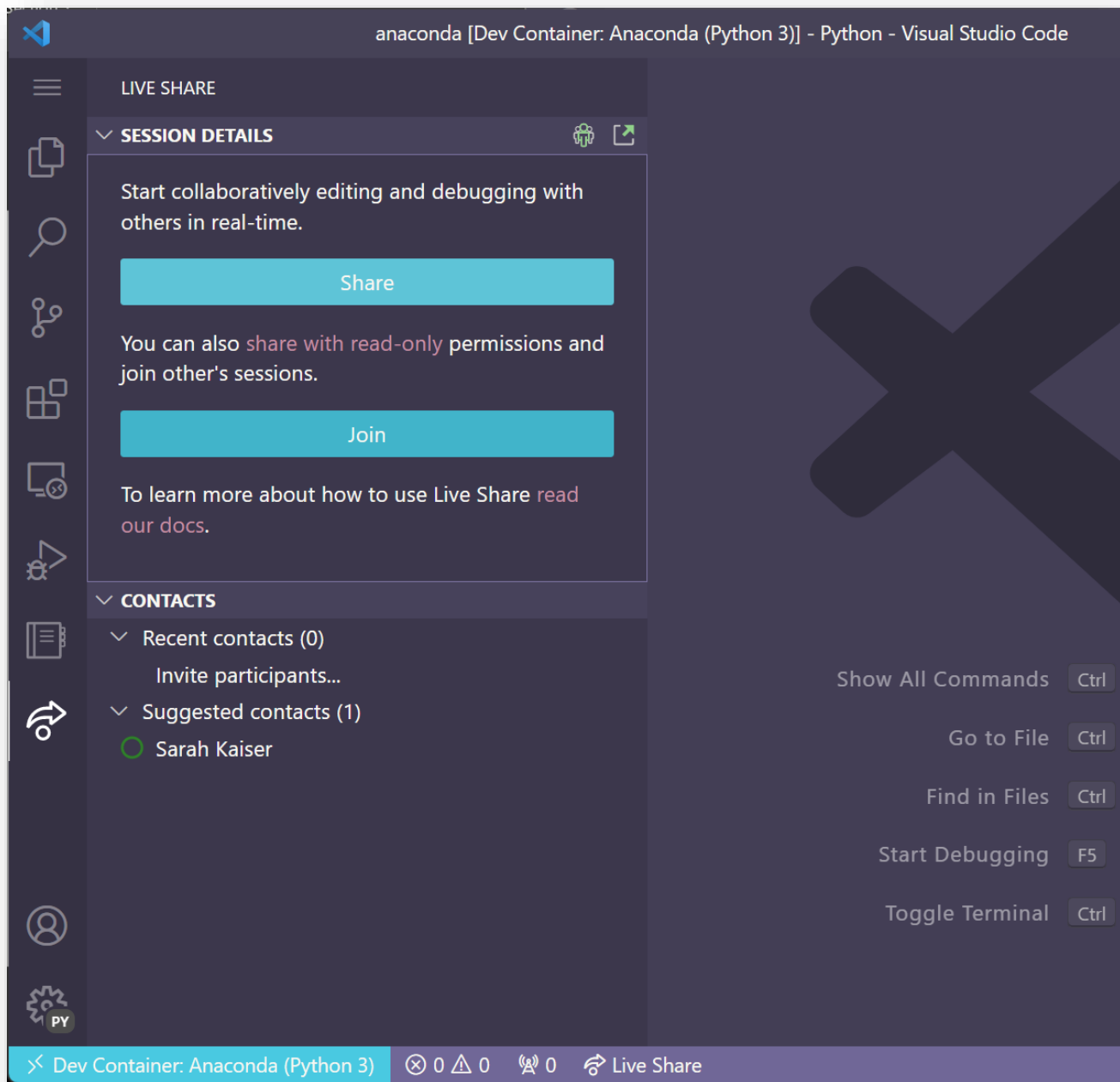
Days

Every day ▾

Times

1:00 PM, 3:30 AM ▾

(GMT -05:00) America/Chicago ▾



Debug things live

Liveshare + Dev Containers

Feedback on NumPy codespace - tracking issue #23134

New issue

Open InessaPawson opened this issue on Jan 30 · 2 comments



InessaPawson commented on Jan 30

Member



Please submit all your feedback on the NumPy codespace (including positive! 🌟) in the comments below.



taldcroft mentioned this issue on Jan 31

Coordination meeting 2023

astropy/astropy-project#255

Open



taldcroft commented on Jan 31



Assignees

No one assigned

Labels

None yet

Projects

None yet

Milestone

No milestone

numpy / numpy Public

Sponsor

Edit Pins

Watch 574

Fork 7.9k

Star 22.9k

<> Code

Issues 2k

Pull requests 177

Actions

Projects 10

Wiki

...

numpy / .devcontainer /

Add file

...

jungaretti DEV: Fix shell configuration in devcontainer (#23076) ✖

4362da7 · on

Name

Last commit message

..

devcontainer.json

DEV: Fix shell configuration in devcontainer (#23...

setup.sh

DEV: Fix shell configuration in devcontainer (#23...

NumPy Community Calendar

NumPy Community Call

NumPy Triage Call

NumPy Documentation Team meeting (Europe/Africa/Asia)

NumPy Documentation Team meeting (Americas/Oceania)

NumPy Newcomers' Hour (Europe/Africa/Asia)

NumPy Newcomers' Hour (Americas/Oceania)

scientific-python.org/calendars

Case Study: NumPy

Dev containers + Codespaces make it easy to organize sprints and develop tutorials



aka.ms/pycon_devcontainers

Demo!



Start a new Dev Container project directly from GitHub



Your codespaces

[Go to docs](#)[New codespace](#)

Explore quick start templates

[See all](#)

Blank

By github ✓



Start with a blank canvas or import any packages you need.

[Use this template](#)

React

By github ✓



A popular JavaScript library for building user interfaces based on UI components.

[Use this template](#)

Jupyter Notebook

By github ✓



JupyterLab is the latest web-based interactive development environment for notebooks, code, and data.

[Use this template](#)

Owned by crazy4pi314

crazy4pi314/azure-docs-pr

animated meme

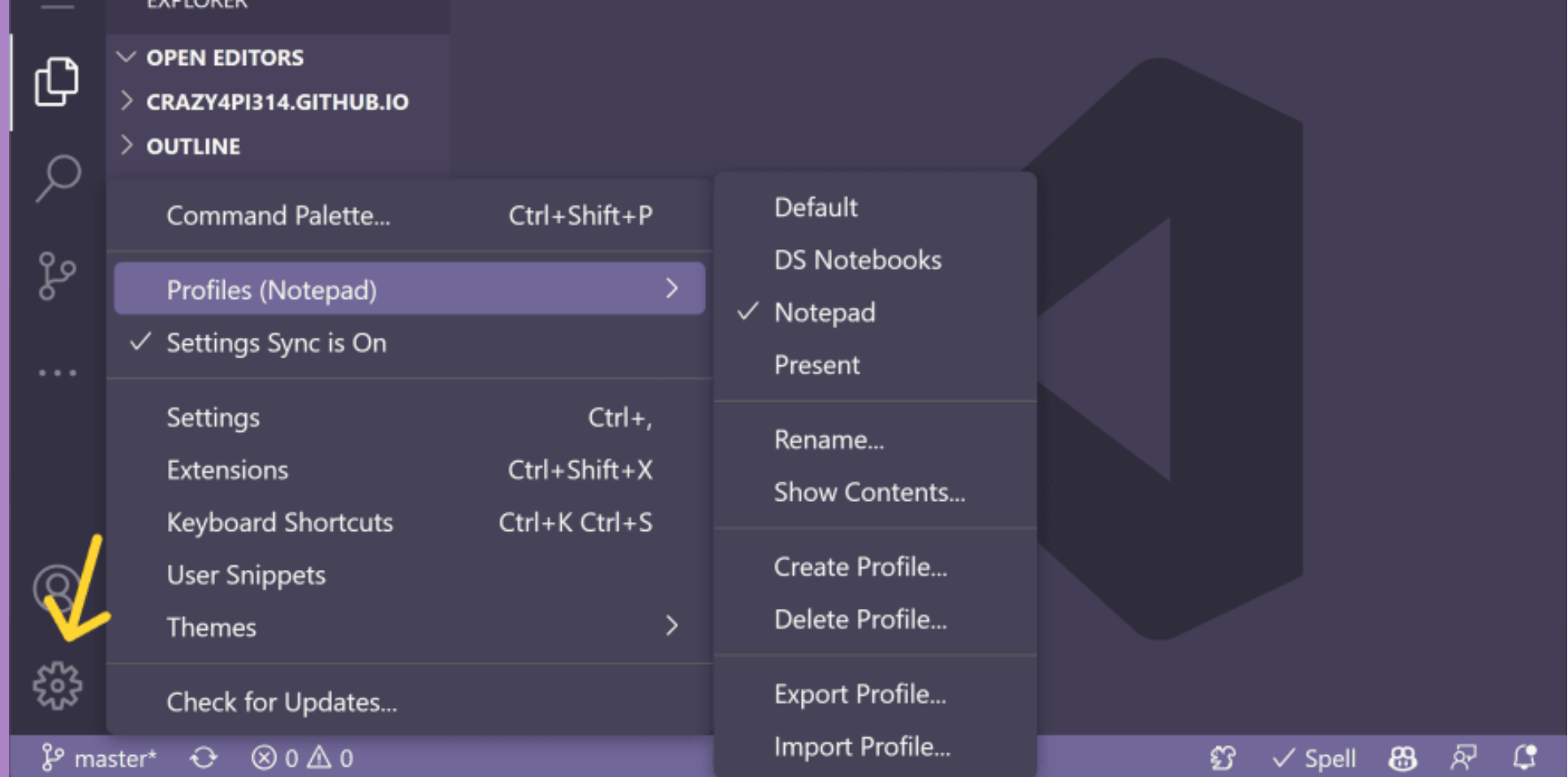
`main` No changes

⚙️ 16-core • 📄 [Request Usage Report](#) • Last used 12 days ago • ⋮

lemillermicrosoft/skonsole

BONUS TIP: VS Code Profiles

Lightweight
option for
editor
customization



Do you use VS Code on different types of projects, but only need to customize the editor? Try Profiles!

aka.ms/custom-vscode-profiles

Labour and rest, that equal periods keep

Wrap-up

Dev Containers:



Specify a full development environment, code and editor included



Speed up collaboration with reproducible + shareable workspaces

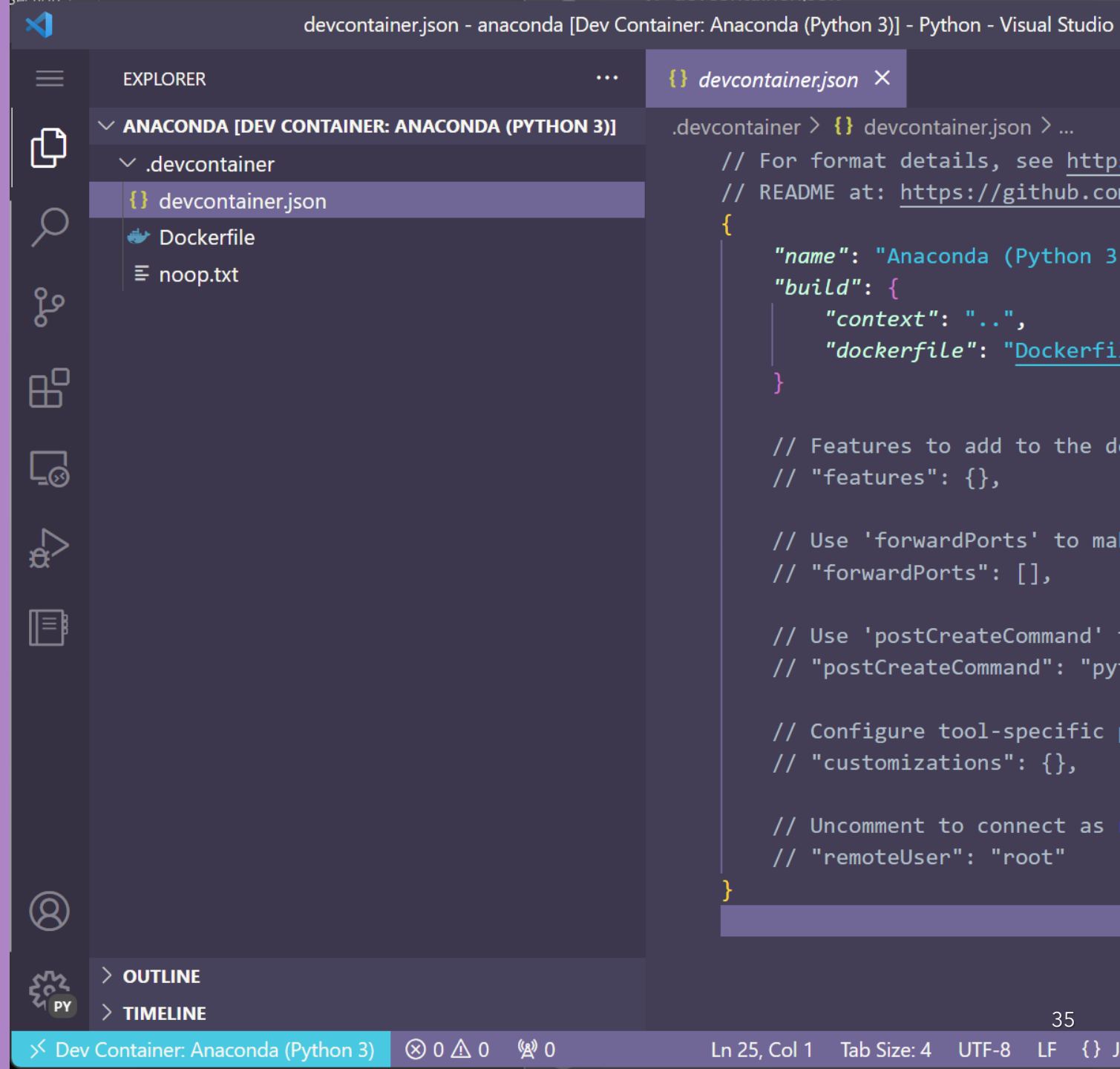


Make teaching easier by reducing setup complexity and hardware constraints

"Pray develop easy now, my environs every ready"



*aka "Let's try my
Dev Container"*





aka.ms/pycon_devcontainers

mathstodon.xyz/@crazy4pi314

sckaiser.com

Check out more ways
Microsoft works with
Python [→](#)



Thank you!