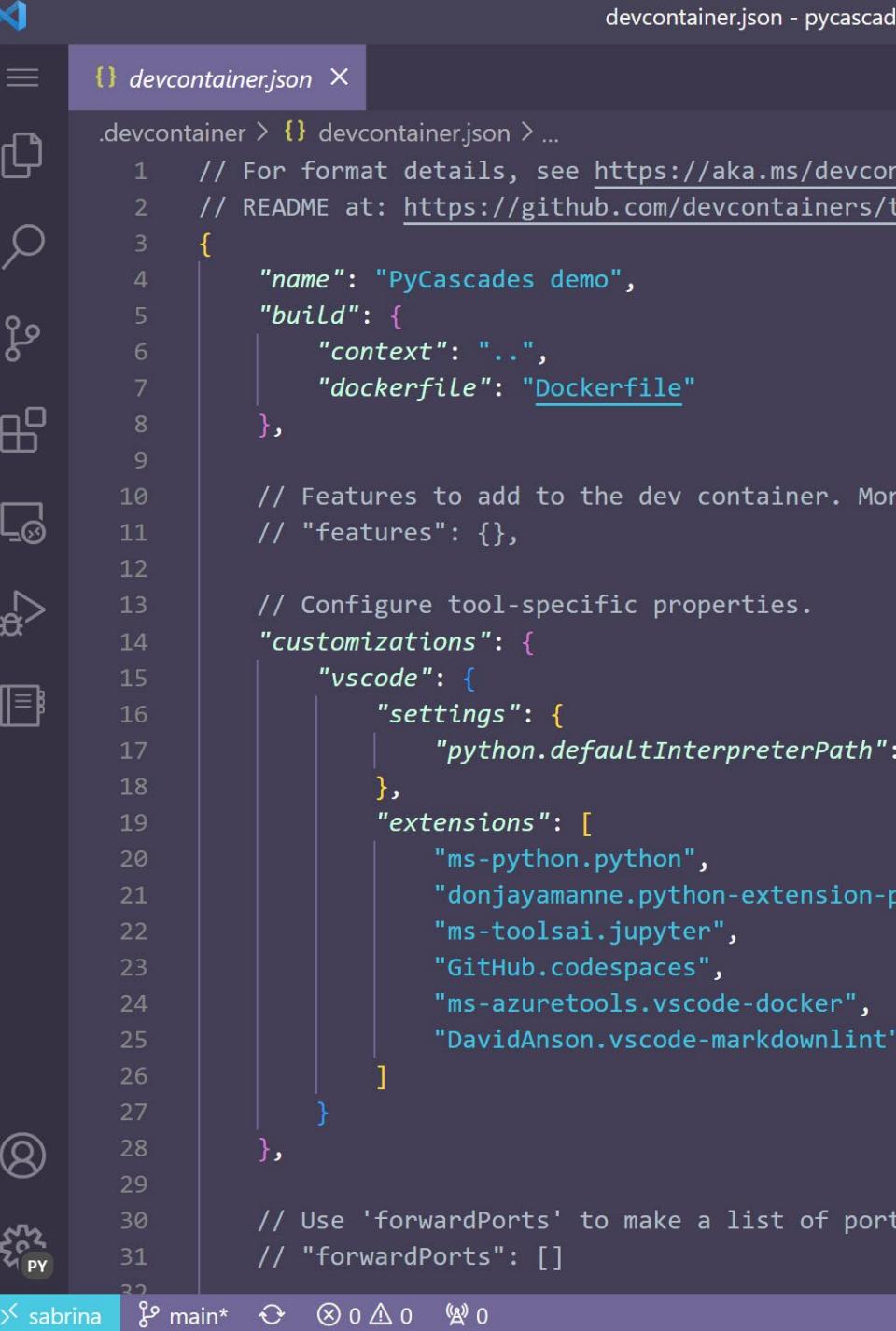


Eternal sunshine of the spotless development environment

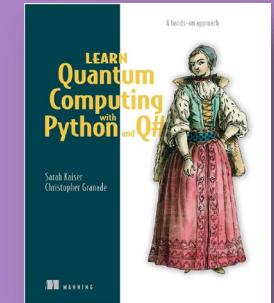
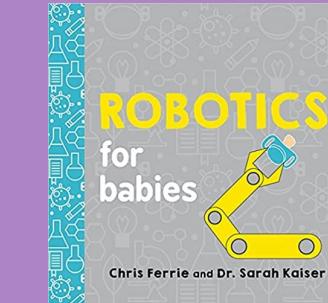
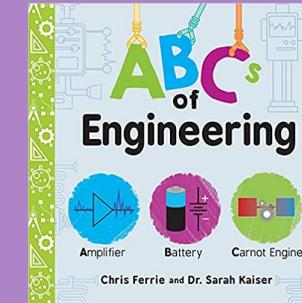
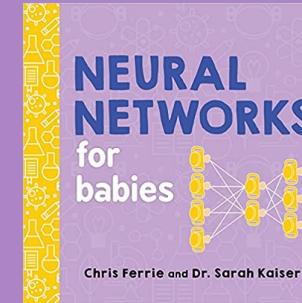
Dr. Sarah Kaiser (she/her)

Sr. Developer Advocate @ Microsoft



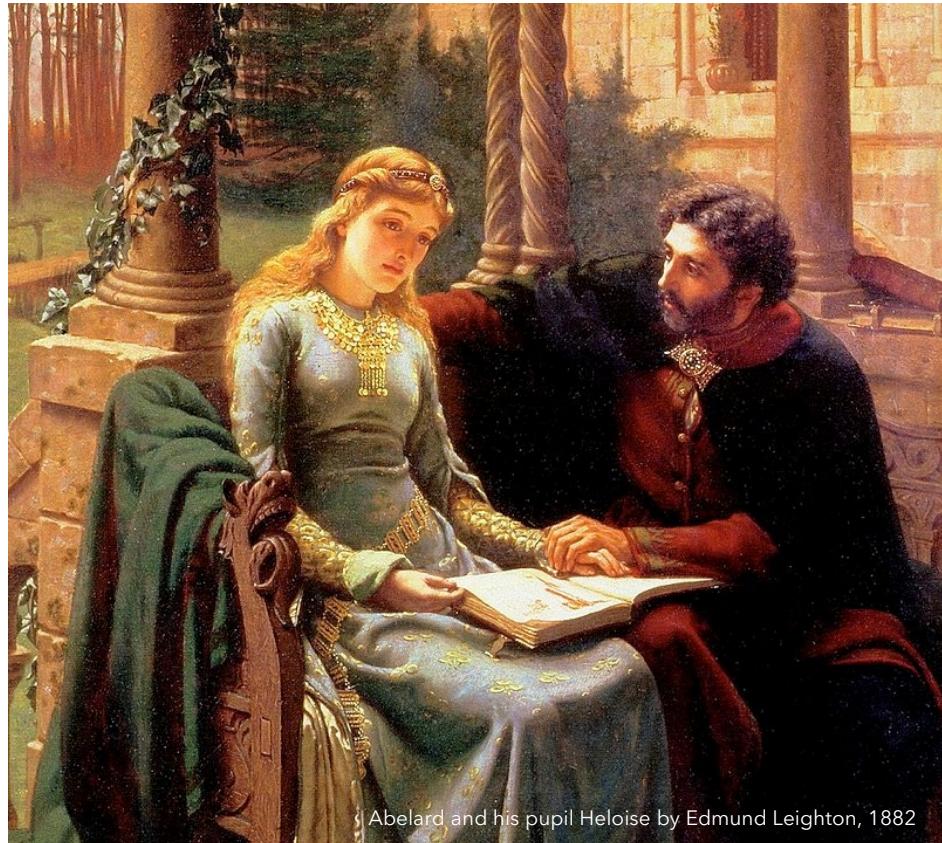
```
.devcontainer > {} devcontainer.json > ...
1   // For format details, see https://aka.ms/devcontainerJSON
2   // README at: https://github.com/devcontainers/tutorials/tree/main/python
3   {
4     "name": "PyCascades demo",
5     "build": {
6       "context": ".",
7       "dockerfile": "Dockerfile"
8     },
9
10    // Features to add to the dev container. More details: https://aka.ms/devcontainerJSON#features
11    // "features": {},
12
13    // Configure tool-specific properties.
14    "customizations": {
15      "vscode": {
16        "settings": {
17          "python.defaultInterpreterPath": "venv/bin/python"
18        },
19        "extensions": [
20          "ms-python.python",
21          "donjayamanne.python-extension-pack",
22          "ms-toolsai.jupyter",
23          "GitHub.codespaces",
24          "ms-azuretools.vscode-docker",
25          "DavidAnson.vscode-markdownlint"
26        ]
27      }
28    },
29
30    // Use 'forwardPorts' to make a list of ports available from the container
31    // "forwardPorts": []
32  }
```

Hiya! 🤘



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

Eloisa to Abelard | Alexander Pope 1717



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!**

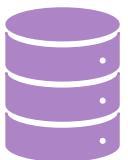


"It doesn't work on my machine"



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

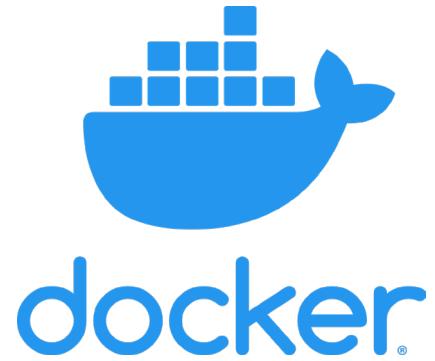


Wrap-up

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

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, 1.18, 1.17
7        // Append -bullseye or -buster to pin to an OS version.
8        // See https://variants.on.containers.dev
9        "VARIANT": "1-bullseye",
10       // Options
11       "NODE_VERSION": "16/*"
12     }
13   },
14   "runargs": [ "-cgo-addsVS_PTRACE", "--security-opt", "seccomp=unconfined" ],
15
16
17   // Configure tool-specific properties.
18   "customization": {
19     // Configure properties specific to VS Code.
20     "vscode": {
21       // Set "default" container specific settings.json values on container.create.
22       "settings": {
23         "go.toolsManagement.checkForUpdates": "local",
24         "go.useLanguageServer": true,
25         "go.gopath": "/go"
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

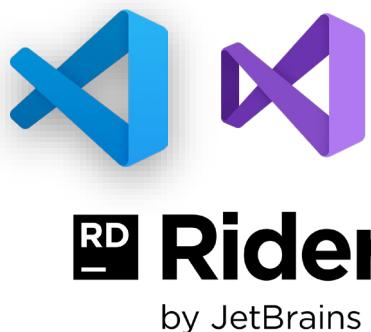
Check out the latest reference implementation and schemas.



Supporting Tools

A variety of tools and services support this standard.

Layouts, settings, themes, oh my!



The screenshot shows the Visual Studio Code interface with the file `devcontainer.json` open in the editor. The code defines a development container named "PyCascades demo" using a Dockerfile. It includes sections for customizations and tool-specific properties (vscode), specifying Python settings and extensions like ms-python.python and ms-toolsai.jupyter.

```
devcontainer.json - pycascades_devcontainers [sabrina] - Python - Visual Studio Code

{
  "name": "PyCascades demo",
  "build": {
    "context": "...",
    "dockerfile": "Dockerfile"
  },
  // Features to add to the dev container:
  // https://containers.dev/features.
  // "features": {},
  // Configure tool-specific properties.
  "customizations": [
    {
      "vscode": {
        "settings": {
          "python.defaultInterpreterPath": "/opt/conda/envs/pycascades_demo/bin/python"
        },
        "extensions": [
          "ms-python.python",
          "donjayamanne.python-extension-pack",
          "ms-toolsai.jupyter"
        ]
      }
    }
  ]
}

// Features to add to the dev container:
// https://containers.dev/features.

// Configure tool-specific properties.

// "customizations": [
//   {
//     "vscode": {
//       "settings": {
//         "python.defaultInterpreterPath": "/opt/conda/envs/pycascades_demo/bin/python"
//       },
//       "extensions": [
//         "ms-python.python",
//         "donjayamanne.python-extension-pack",
//         "ms-toolsai.jupyter"
//       ]
//     }
//   }
// ]
```

Theme: Witch Hazel | Font: Cascadia Code

Where do they run?



Local editors with Docker



Codespaces



Cloud hosting services

Where do they run?



Local editors
with Docker



Codespaces



Cloud hosting
services



Start with a devcontainer.json...



pycascades_devcontainers - 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/miniconda
3 {
4     "name": "PyCascades demo",
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    // Configure tool-specific properties.
14    "customizations": {
15        "vscode": {
16            "settings": {
17                "python.defaultInterpreterPath": "/opt/conda/envs/pycascades_demo"
18            }
19        }
20    }
21}
```

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

Settings

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

Full reference: containers.dev/implementors/json_reference/

Add a Dockerfile (or Docker Compose)

```
● ● ●  
1 FROM mcr.microsoft.com/devcontainers/miniconda:0-3  
2  
3 # Copy environment.yml (if found) to a temp location so we update the environment.  
4 # Also copy "noop.txt" so the COPY instruction does not fail if no environment.yml exists.  
5 RUN conda install -n base -c conda-forge mamba  
6 COPY environment.yml* .devcontainer/noop.txt /tmp/conda-tmp/  
7 RUN if [ -f "/tmp/conda-tmp/environment.yml" ]; then umask 0002\  
8     && /opt/conda/bin/mamba env create -f /tmp/conda-tmp/environment.yml; fi \  
9     && rm -rf /tmp/conda-tmp  
10  
11 # [Optional] Uncomment to install a different version of Python than the default  
12 # RUN conda install -y python=3.6 \  
13 #     && pip install --no-cache-dir pipx \  
14 #     && pipx reinstall-all  
15  
16 # [Optional] Uncomment this section to install additional OS packages.  
17 # RUN apt-get update && export DEBIAN_FRONTEND=noninteractive \  
18 #     && apt-get -y install --no-install-recommends <your-package-list-here>
```

...or just pick a template 😊

The screenshot shows the Visual Studio Code interface with the "Python - Visual Studio Code" title bar. A context menu is open from the "Dev Containers" icon in the sidebar, listing options like "Create Dev Container...", "Attach to Running Container...", and "Clone Repository in Container Volume...". To the right, the "Remote Development" extension page is displayed, featuring its logo, developer information, and a "Select Dev Container Configuration" dropdown. This dropdown lists several container configuration templates, with "Anaconda (Python 3) devcontainers" currently selected.

Python - Visual Studio Code

Select an option to open a Remote Window

- 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...

WSL

Remote-SSH

Dev Containers

Remote Development Preview

Microsoft | 3,691,616 installs | ★★★★★ (106) | Free

An extension pack that lets you open any folder in a container, on a remote machine, or in WSL and take advantage of VS Code's full feature set.

Install Trouble Installing?

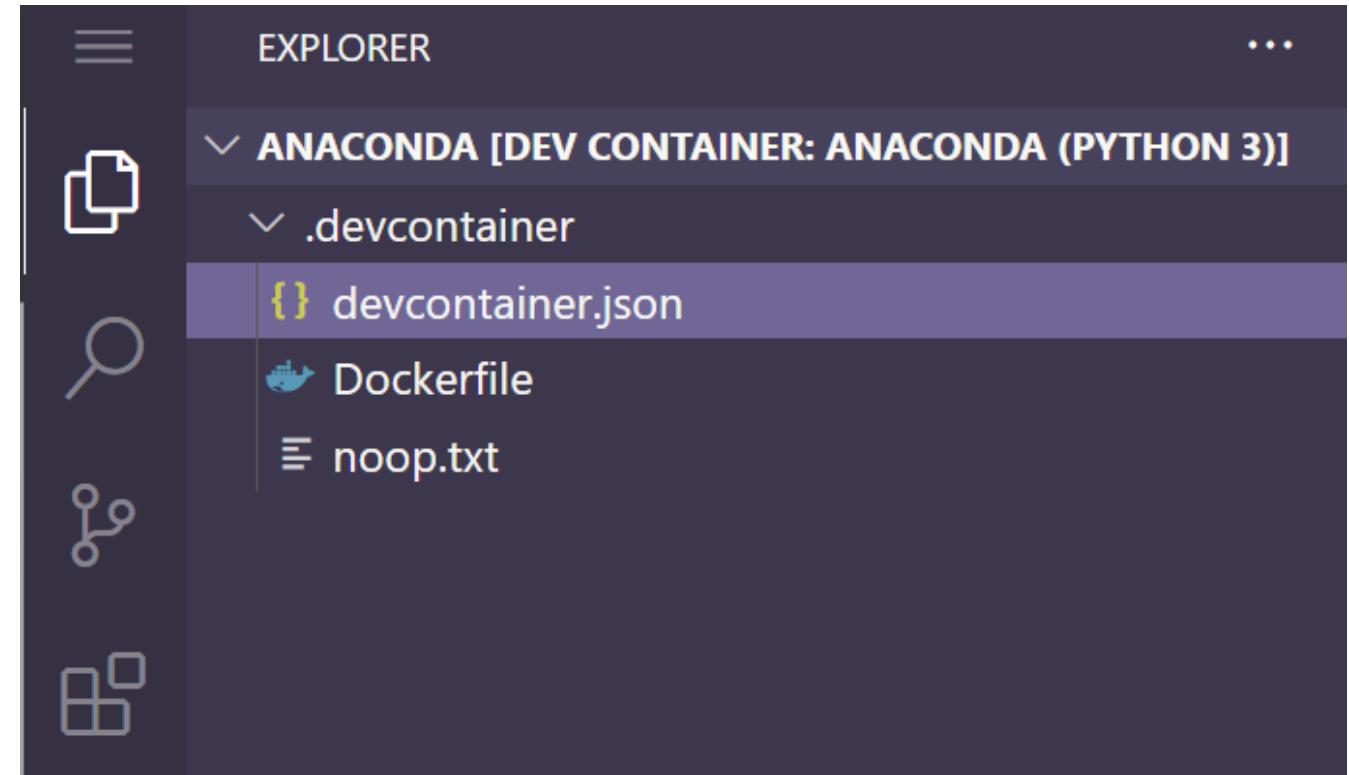
Select Dev Container Configuration

Select a container configuration template

- Alpine devcontainers ⓘ
- Simple Alpine container with Git installed.
- Anaconda (Python 3) devcontainers ⓘ
- Develop Anaconda applications in Python3. Installs dependencies from your envi... ⓘ
- Anaconda (Python 3) & PostgreSQL devcontainers ⓘ
- Develop Anaconda & PostgreSQL applications in Python3. Installs dependencies fro...
- Azure Ansible community
- Get going quickly with Ansible in Azure. Includes Ansible, the Azure CLI, the Docker C...
- 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

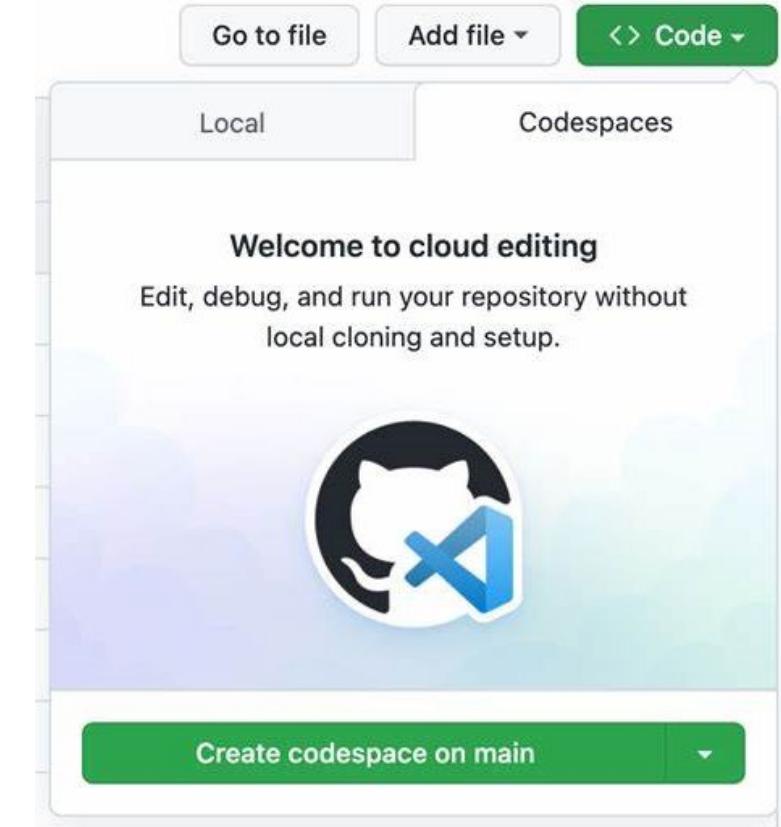
**“Here, let
me just
send you a
screen
shot”**



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

Dev Containers + ❤️ CODESPACES ❤️

- Spin up fully configured Dev Containers in the cloud that start in seconds with up to 60 hours a month free.
- Supports lots editors/interfaces locally and in the browser
- Work from anywhere with whatever compute power you need.



Managing contributions can be challenging...

The screenshot shows the VS Code interface with the file `vscode / CONTRIBUTING.md` open. The main pane displays the following 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 an issue, which you can access by using `Report Issue` in VS Code's Help menu, can help streamline this process by automatically providing the version of VS Code, all your installed extensions, and your system info. Additionally, the tool will search among existing issues to see if a similar issue already exists.

Please include the following with each issue:

- Version of VS Code
- Your operating system

The right sidebar shows the outline of the `CONTRIBUTING.md` file, with the section `Writing Good Bug Reports and Feature Requests` highlighted.

Can't reproduce CI issues...

main
failed yesterday in 2m 43s

> Install dependencies 1m 34s

▼ 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
17     make_classifier
18       with open(os.path.join(BASE_PATH, category+'_'+model, 'target_names.json')) as fp:
19     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:

A screenshot of a GitHub issue creation interface. At the top left is a circular profile picture of a woman with glasses and purple hair. Next to it is the title "Cleanup script not running". Below the title are two buttons: "Write" (which is selected) and "Preview". To the right of these buttons are several Markdown-style formatting icons: H, B, I, E, <>, C, E, 1/2 E, S, @, and a link icon. The main text area contains the following content:

```
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/crazy4pi314/75a4b34f763bfdb2e56a0afa4ecef73) with a  
Dev Container where you can reproduce the issue.
```

Below the text area, there is a message "Thanks! ❤️". At the bottom of the interface, there is a note "Attach files by dragging & dropping, selecting or pasting them." followed by a "M+" button. At the very bottom, there is a note "Styling with Markdown is supported" next to a small "M" icon, and a blue "Submit new issue" button.

Jump right in to review PRs

Adds multiline quick input support #177045

Draft

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

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

Code ▾

Local Codespaces

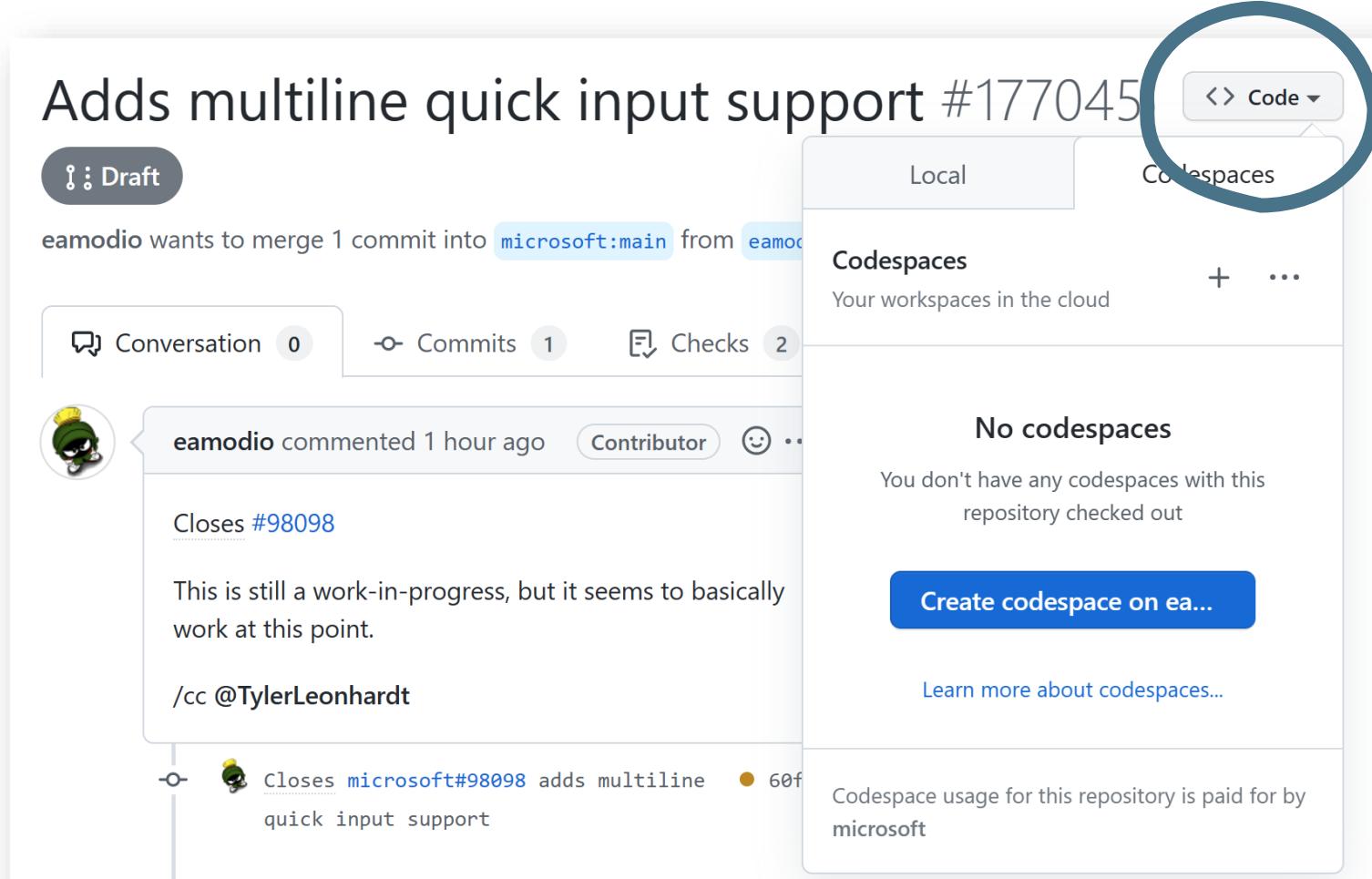
No codespaces

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

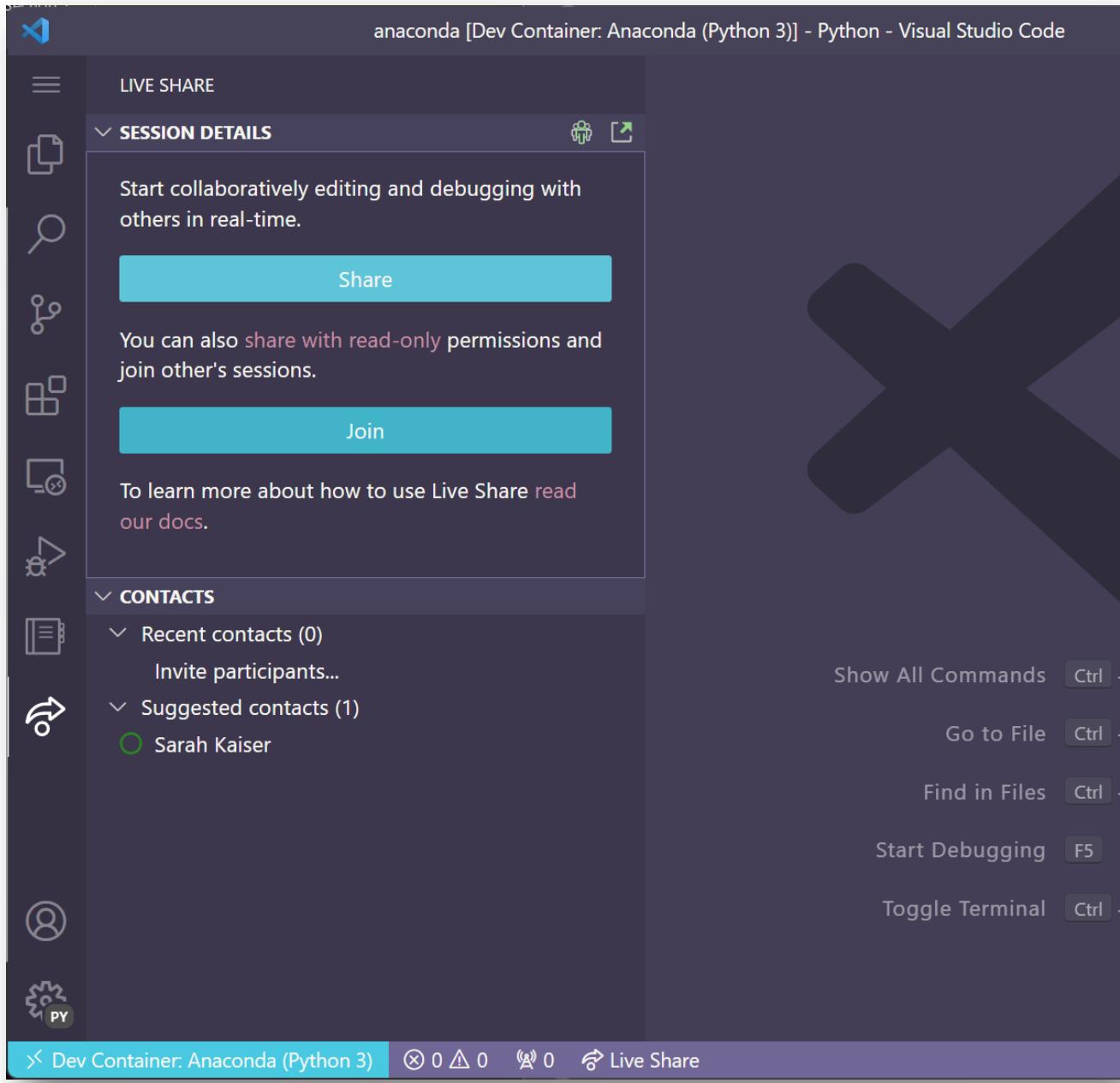
[Create codespace on ea...](#)

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

Codespace usage for this repository is paid for by microsoft



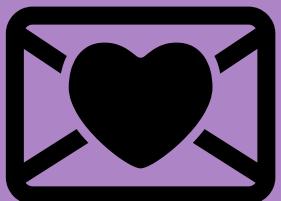
Codespaces + Dev Containers



Debug things live

Liveshare + Dev Containers

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



crazy4pi314 / Dockerfile

Created 3 months ago

<> Code -o-Revisions 1

Fast mamba containers

devcontainer.json

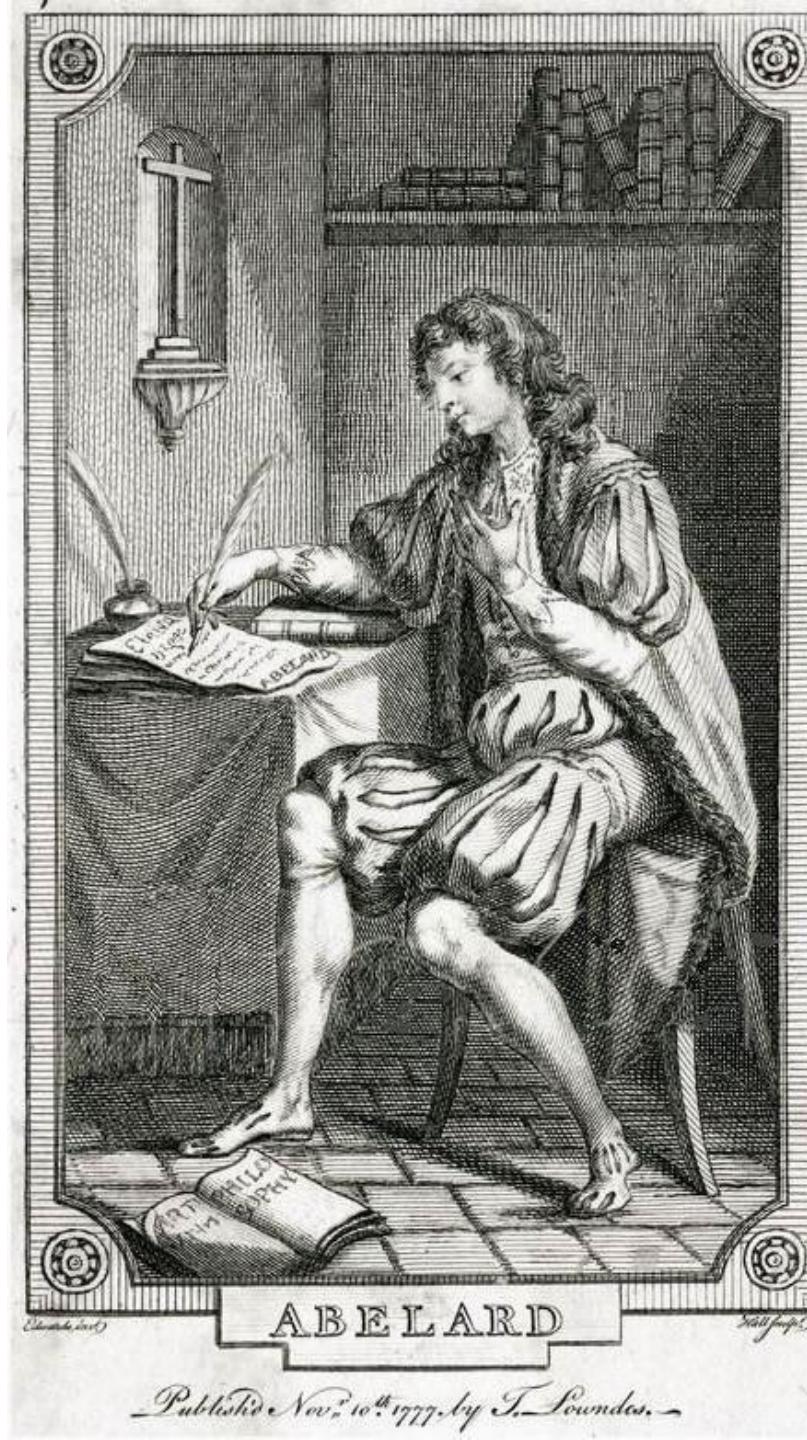
```
1 // For format details, see https://aka.ms/devcontainer.json. For config options, see the
2 // README at: https://github.com/devcontainers/templates/tree/main/src/anaconda
3 {
4     "name": "Fast mamba",
5     "build": {
6         "context": "..",
7         "dockerfile": "Dockerfile"
8     },
9
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

**"I thought I
tested this
sample on
<OS>, now
it's
broken"**

Abelard neglecting his philosophical studies to write to Eloisa,
designed by Edward Edwards (London 1777)



Easy setup for instructors

 GitHub Education

Overview Repositories Projects Packages People

Search: codespaces Type Language Sort Clear filter

6 results for all repositories matching codespaces sorted by last updated

codespaces-project-template-dotnet Public template

Codespaces template for building a .NET project

HTML MIT 13 stars 25 forks 0 issues 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 151 forks 1 issue Updated 4 days ago

codespaces-teaching-js-template Public template

Codespaces template for teaching JavaScript

codespaces-teaching-js javascript education

JavaScript MIT 9 stars 14 forks 0 issues 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.

Follow

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 devcontai... ↑ 1 ↗ 1

[View all discussions](#)

People



Branch
This branch will be checked out on creation

Dev container configuration
Your codespace will use this configuration

Region
Your codespace will run in the selected region

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

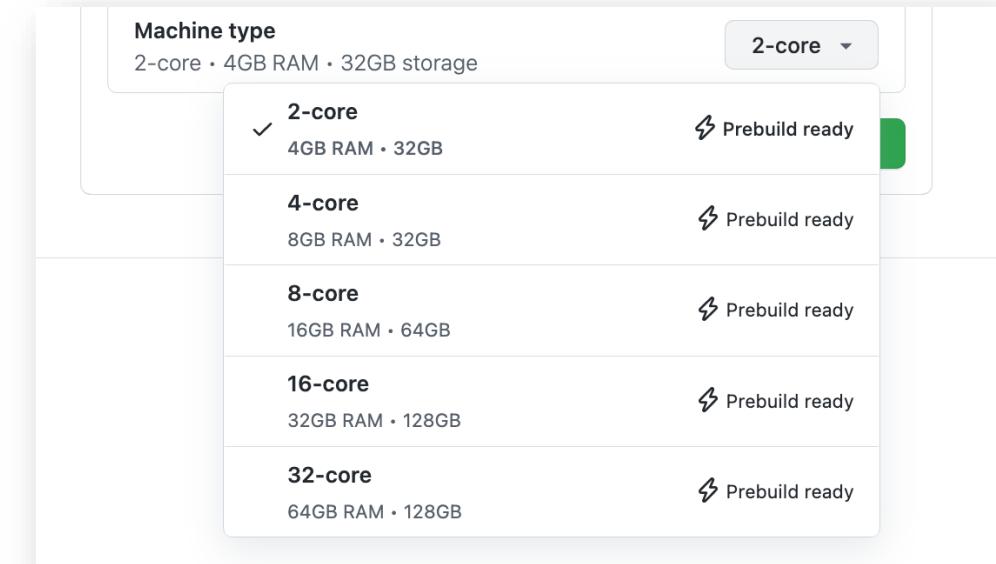
Terms Privacy Security Status D

2-core 4GB RAM • 32GB
4-core 8GB RAM • 32GB
8-core 16GB RAM • 64GB
16-core 32GB RAM • 128GB

Choose the right machine for the job



Use Pre-builds to speed up launch



A screenshot of the "Prebuild triggers" configuration interface. It includes a description of how often to prebuild based on repository changes or a schedule, and two trigger options: "Every push" (selected) and "On configuration change". It also shows a "Scheduled" trigger section with "Days" set to "Every day" and "Times" set to "1:00 PM, 3:30 AM" and "(GMT -05:00) America/Chicago".

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 ▾

*Can add some cost depending on frequency

Feedback on NumPy codespace - tracking issue #23134

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

taldcroft commented on Jan 31 ...

New issue

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 /

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)

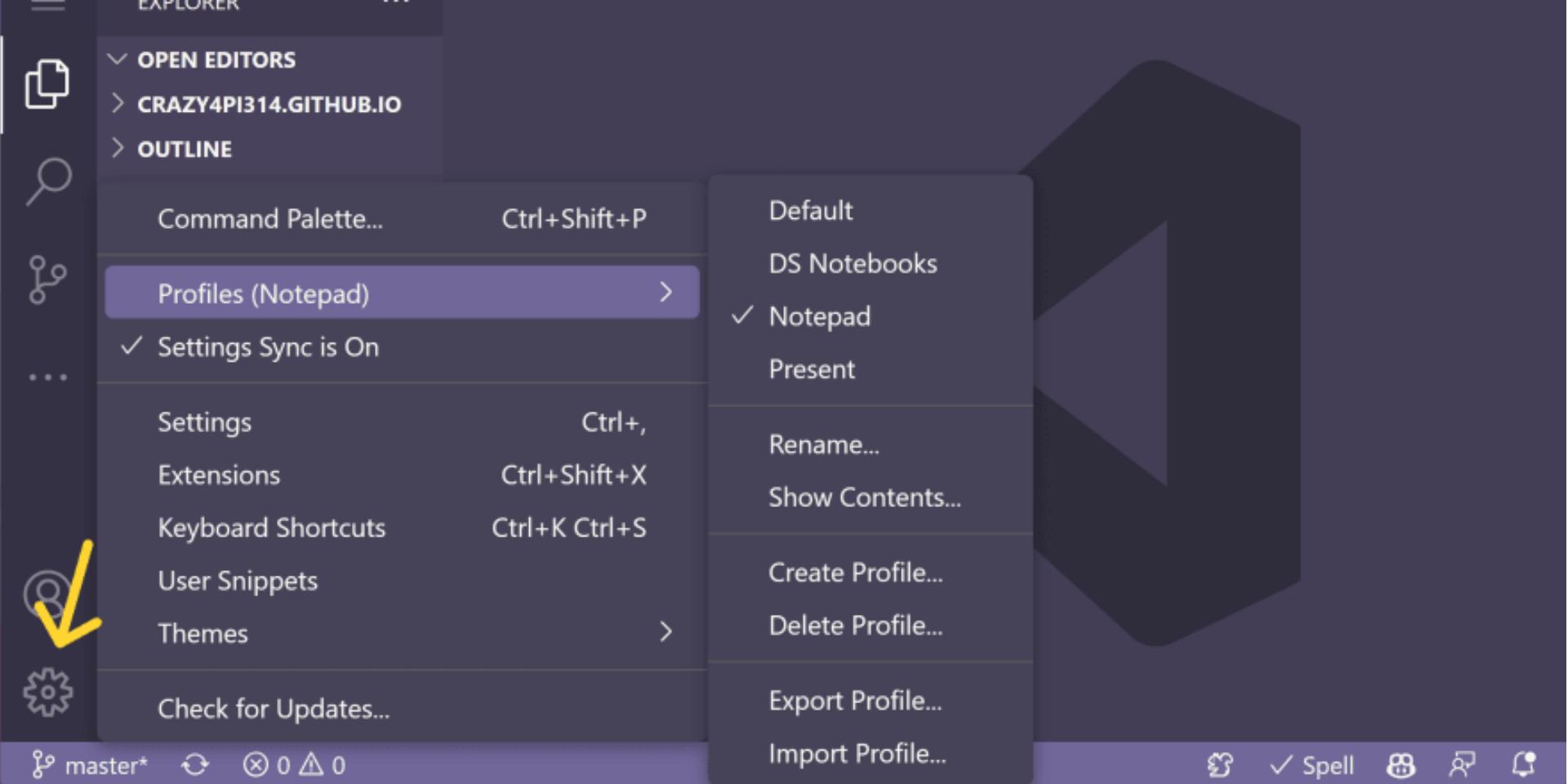
scientific-python.org/calendars

Case Study: NumPy

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

TIP: VS Code Profiles

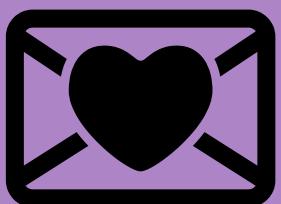
Lightweight option for editor customization



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

aka.ms/custom-vscode-profiles

"Open a browser and launch it in a Codespaces"



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

lemillermsft/skconsole



aka.ms/pycascades_devcontainers

Demo!



Labour and rest, that equal periods keep

Wrap-up

Dev Containers:



Specify a full development environment, code and editor included

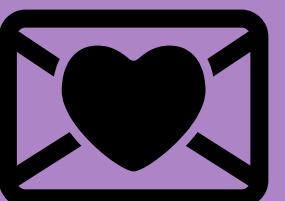


Speed up collaboration with reproducible + shareable workspaces



Make teaching easier by reducing setup complexity and hardware constraints

"I'll send you a Dev Container!"



devcontainer.json - anaconda [Dev Container: Anaconda (Python 3)] - Python - Visual Studio

EXPLORER ... { } devcontainerjson X

ANACONDA [DEV CONTAINER: ANACONDA (PYTHON 3)] .devcontainer { } devcontainer.jsondevcontainer > { } devcontainer.json > ... // For format details, see http://... // README at: https://github.com/... { "name": "Anaconda (Python 3)", "build": { "context": "...", "dockerfile": "Dockerfile" } }

Dockerfile // Features to add to the dev container // "features": {}, noop.txt // Use 'forwardPorts' to map host ports to the container // "forwardPorts": [], // Use 'postCreateCommand' to run commands after the container has been created // "postCreateCommand": "py ... // Configure tool-specific customizations // "customizations": {}, // Uncomment to connect as root user // "remoteUser": "root" }

OUTLINE TIMELINE

Dev Container: Anaconda (Python 3) 0 0 0 0 Ln 25, Col 1 Tab Size: 4 UTF-8 LF { } J



aka.ms/pycascades_devcontainers

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**Thank
you!**