Developing Extensions for JupyterLab

Meet the instructors

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Exploring Extensions

- What are extensions?
- Examples
  - DrawIO
  - Latex
  - Git
  - Spellchecker
  - Themes
- Installing prebuilt vs source

Git

LaTeX

DrawIO

Anatomy of an Extension

- Extensions, plugins and widgets
- Code Walkthrough…
  - We will be using an example created from https://github.com/jupyterlab/extension-cookiecutter-ts
  - The example is loosely based on the in-depth example found in the jupyterlab documentation: https://jupyterlab.readthedocs.io/en/stable/extension/extension_tutorial.html

Code Exercise

1. Open examples/tutorial_extension dir in your IDE

2. Try adding a toolbar button that refreshes the image using the following hints:

   - The toolbar can be accessed from **`MainAreaWidget.toolbar`**

   - A **`ToolbarButton`** class can be found in **`@jupyterlab/apputils`**

3. An example answer can be found on the next slide if you get stuck

Code Exercise Example Answer

```
const button = new ToolbarButton({
    icon: refreshIcon,
    onClick: () => widget.load_image()
});
main.toolbar.addItem('refresh', button);
```

Debugging JupyterLab Extensions

- When is debugging useful
- Setting up for debugging
- Launching JuyterLab for debugging
- Setting breakpoints
- Other ways to debug

When is debugging useful

- To find errors in code
- Investigating unexpected results
- Understanding the code path
- Learning internals of other extensions

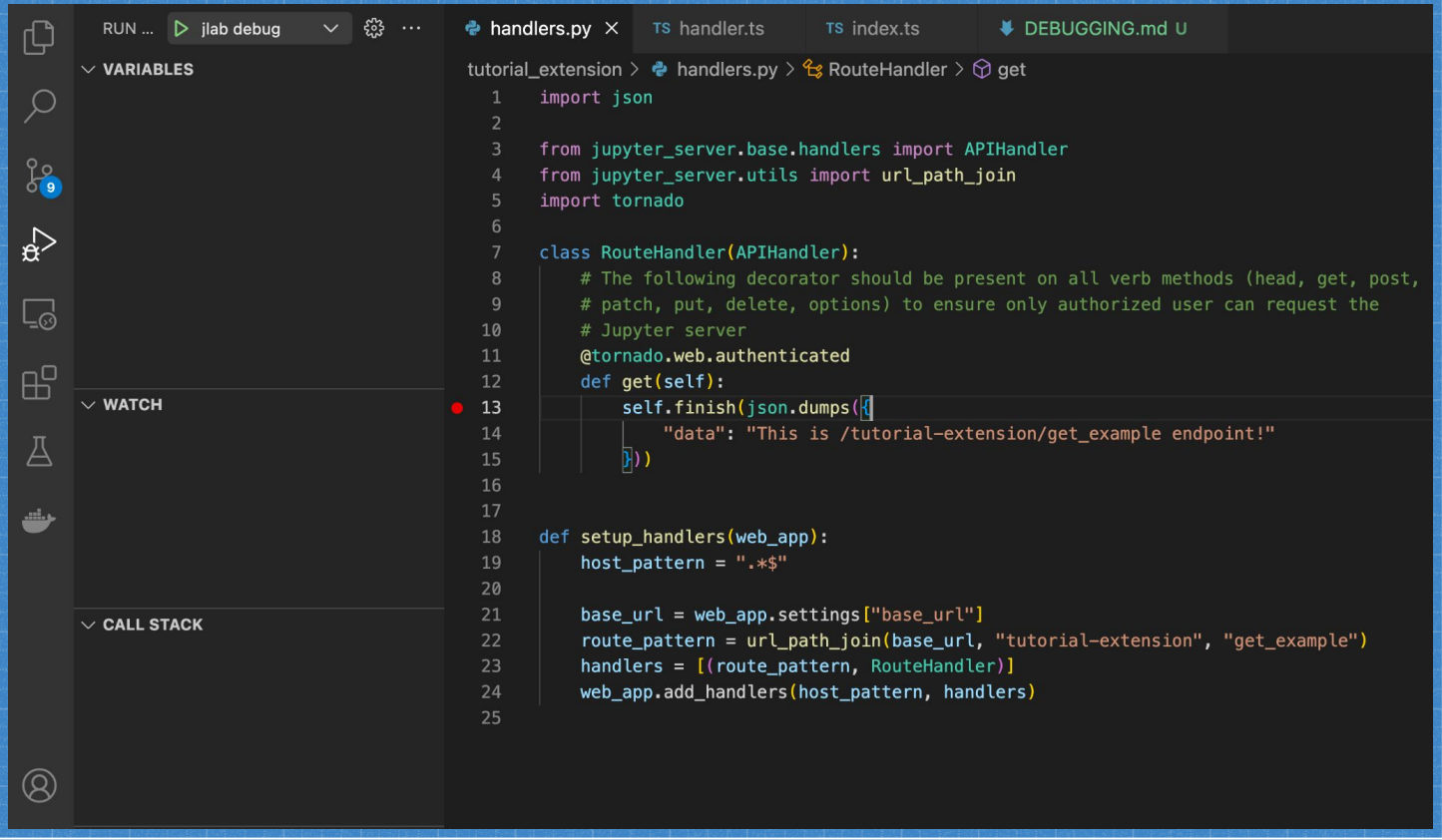
How to know something has gone wrong

- UI elements are missing
- Errors appear in the server log
- Errors appear in the browser console

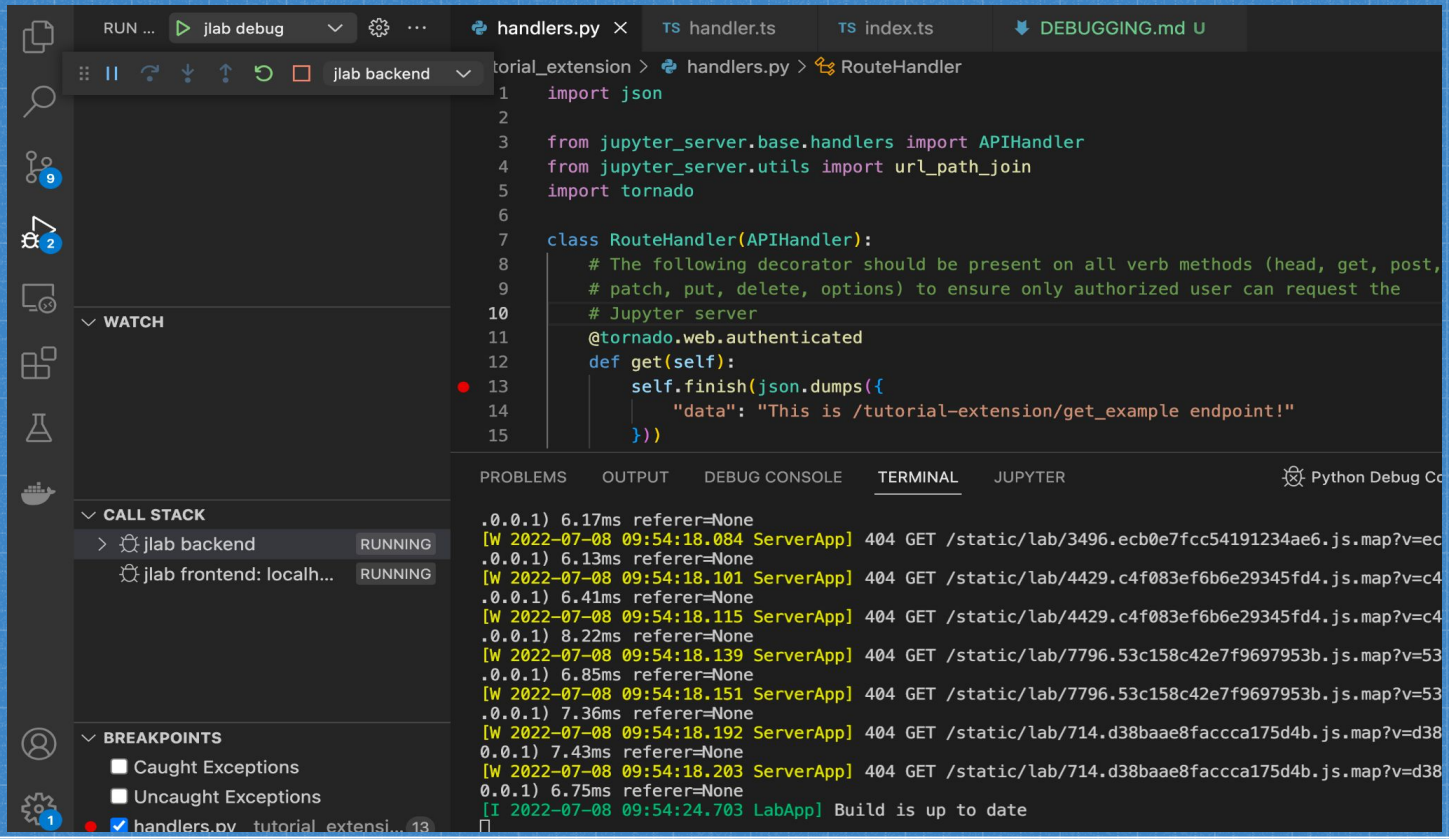
Debugging in Visual Studio Code

- Instructions are in DEBUGGING.md
- Install the cookiecutter package
  `pip install cookiecutter`
- Use the debug-config-cookiecutter
  `cookiecutter ../debug-config-cookiecutter`
- Install the debug dependencies
  `jlpm install`
- Build the extensions
  `jlpm build`

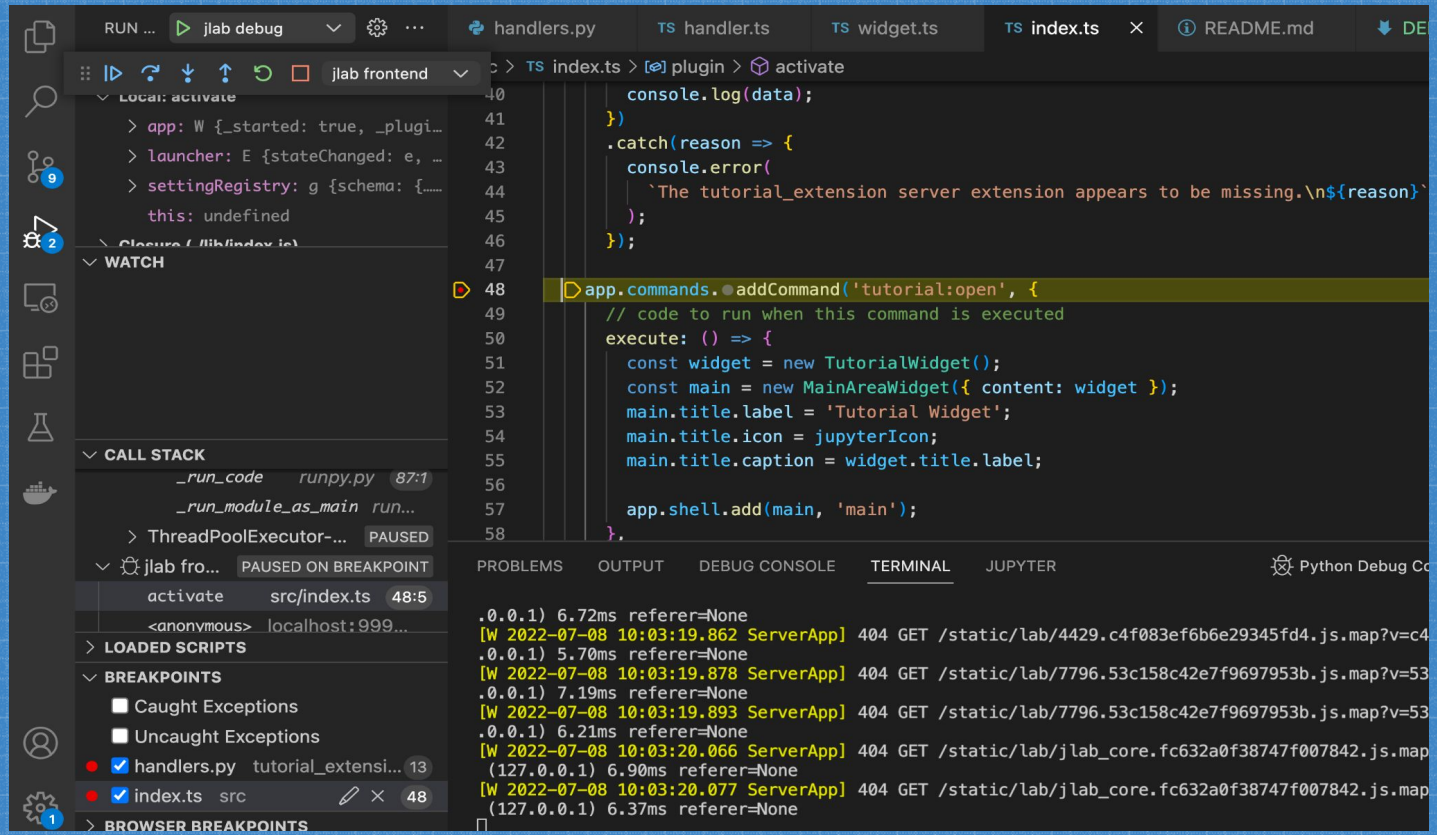
Setting breakpoints



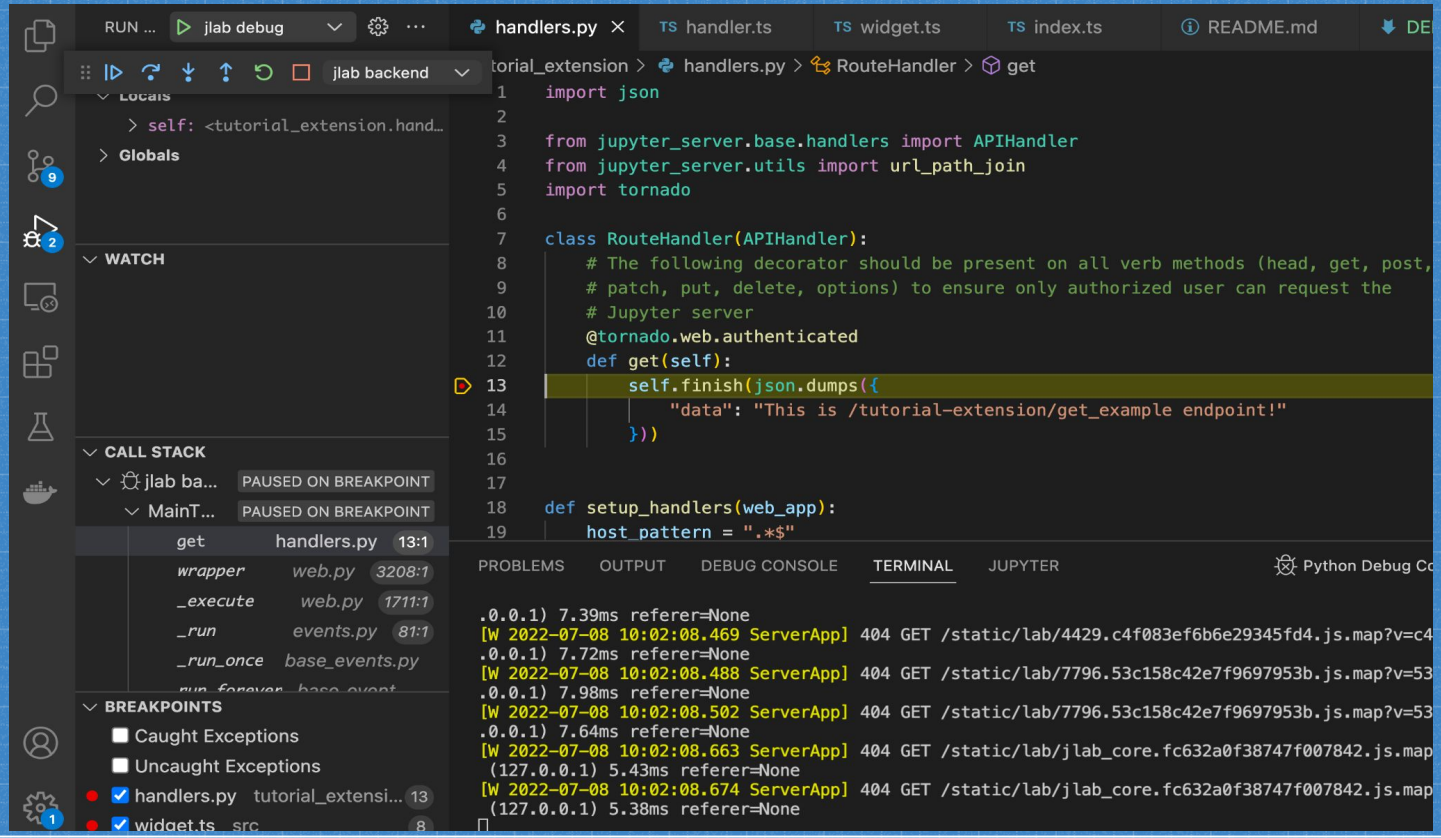
Launching JupyterLab for debugging



Debugging Front End Extension



Debugging Server Extension



Other ways to debug

- Front end extension
  - Use the browser directly to debug
- Server extensions
  - Python’s command line debugger (pdb)

```
import pdb; pdb.set_trace()
```

  - IPython pdb, a better alternative to pdb (pip install ipdb)

```
import ipdb; ipdb.set_trace()
```

Working on Your Own Extension

- Jupyter Server extension
- Theme extension
- Whatever you wanted to start on - or pick from here