JUPYTERLAB EXTENSIONS

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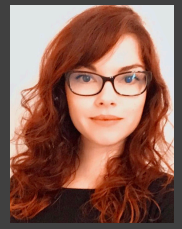

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What is JupyterLab

What are JupyterLab Extensions

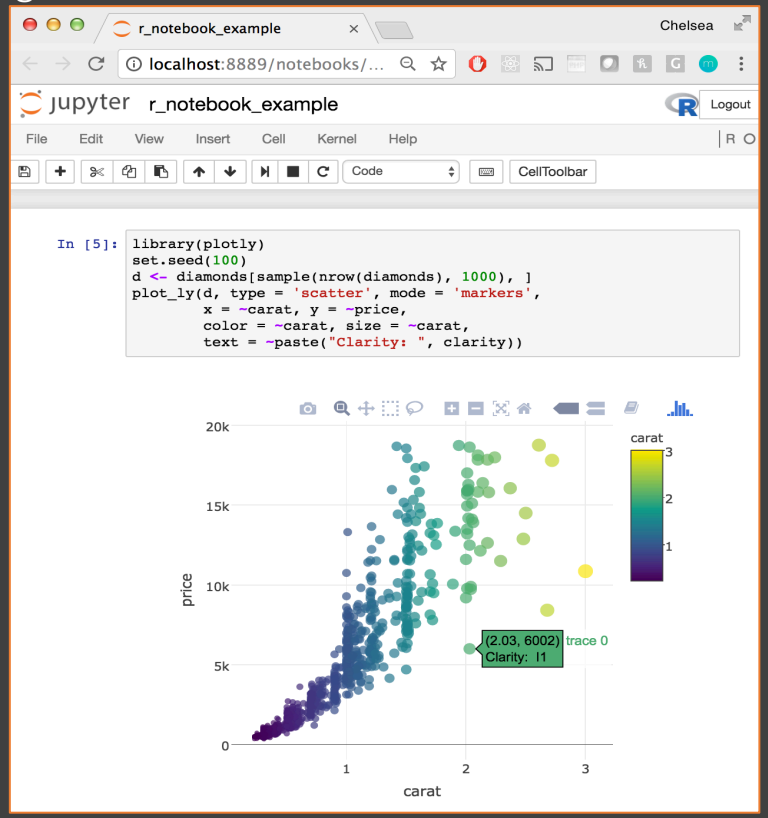
Why use JupyterLab Extensions

Installing Extensions

Creating an Extension

What is JupyterLab?

- Started from **classic Jupyter Notebook,** a web-based interface that can execute code, edit in-place, contain text, images, etc.
- Notebooks presents a document-like view rendered by modern bowsers
- Kernels interpret/execute cell contents with support for over 50 programming languages
- Classic Notebook:



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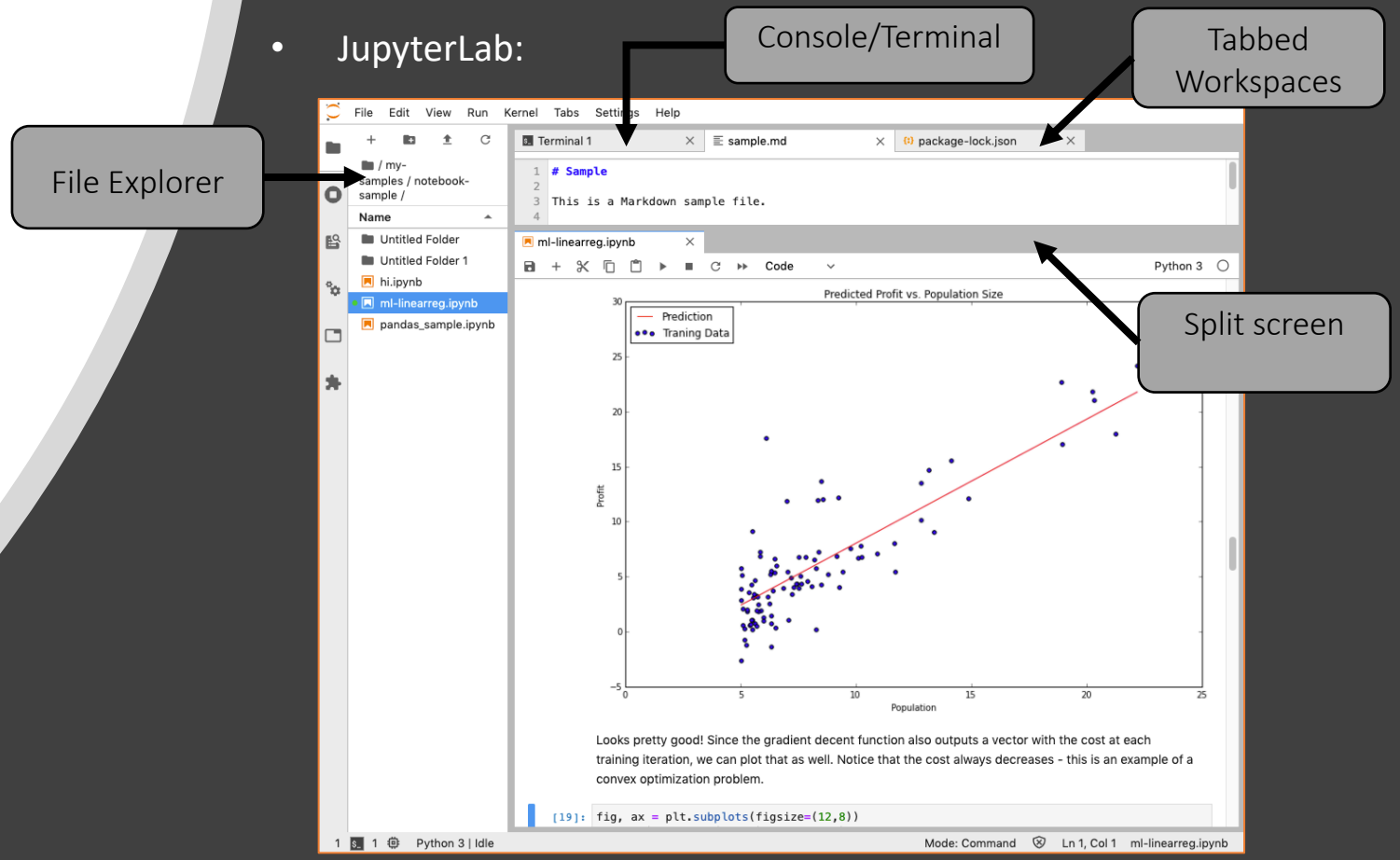
What is JupyterLab?

- JupyterLab is the next generation UI for Project Jupyter
- It provides a modular and extensible architecture
- It will eventually replace the classic Jupyter Notebook UI
- JupyterLab:



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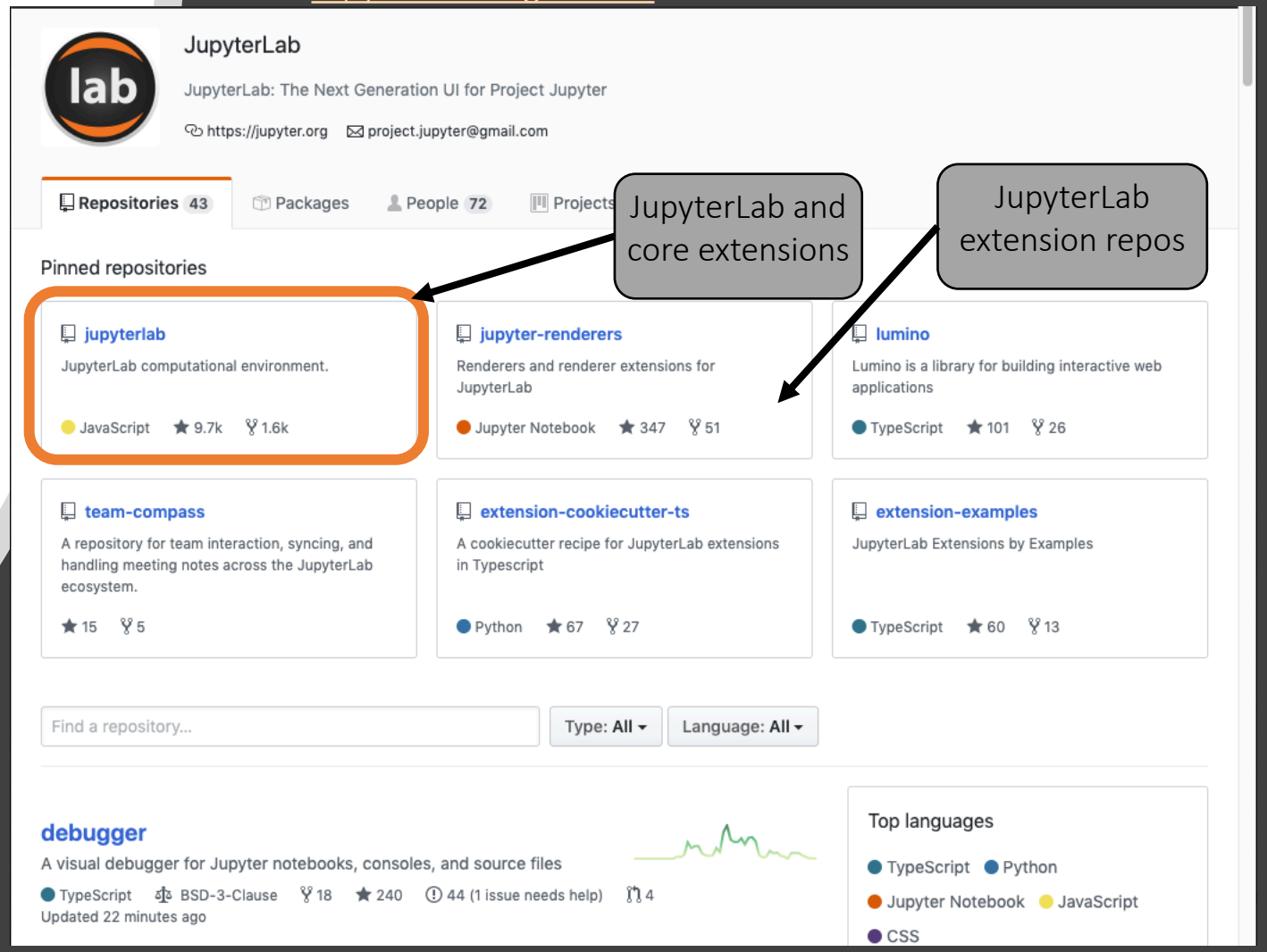
What is JupyterLab?

- On JupyterLab Org Github :



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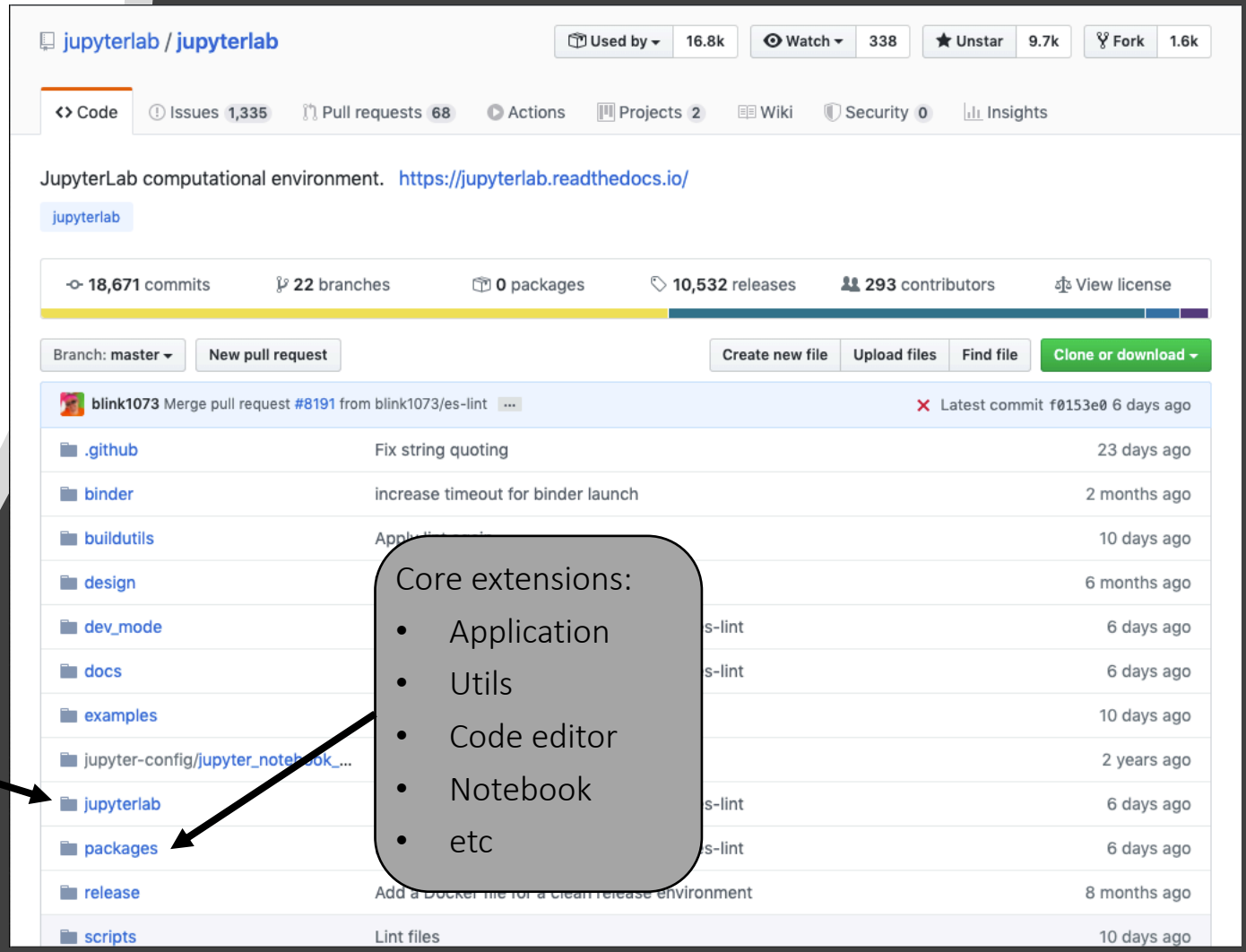

Backend code:

- Handlers
- Commands
- Debug
- Extension setup
- etc

Core extensions:

- Application
- Utils
- Code editor
- Notebook
- etc

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What are JupyterLab Extensions

JupyterLab is designed to be extendable

Extensions enable users and developers to:

- Create new editors and output visualization
- Add buttons and menu items to existing functionality
- Provide APIs for other extensions to use

JupyterLab itself is just a collection of core extensions

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Why use JupyterLab Extensions

The core extensions are intentionally limited in scope

Every user needs slightly different tools for their own work

By installing extensions specific to their scenario they can create a customized environment tailored to their work

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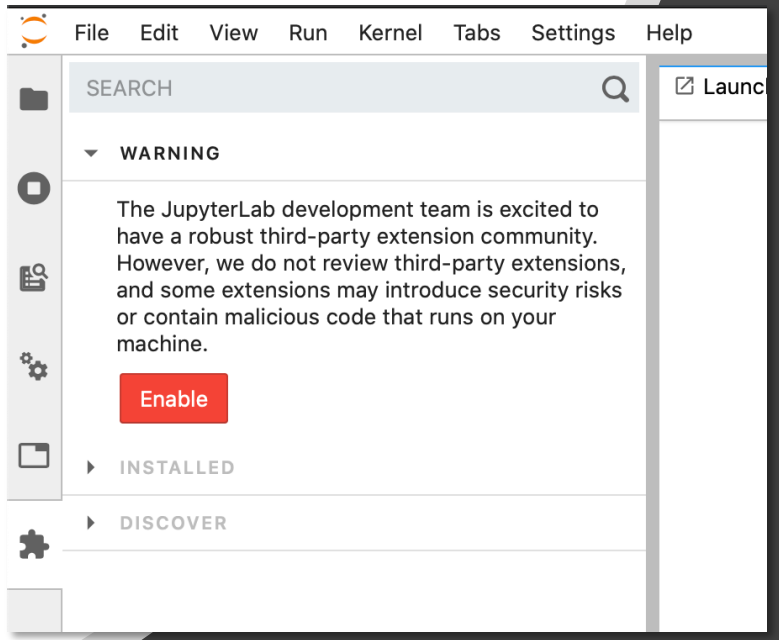
Installing Extensions

1. Start JupyterLab

```
$ jupyter lab
```

2. To install an extension via the UI open the Extension Manager tab in the side bar
   - The UI is still experimental and will show a warning prior to enablement
3. Once enabled it will list currently installed extensions in the Installed section and extensions available to install in the Discover tab.
   - You can search both sections using the search bar
   - The Discover tab displays packages published on npm with the keywork ‘jupyterlab-extension’



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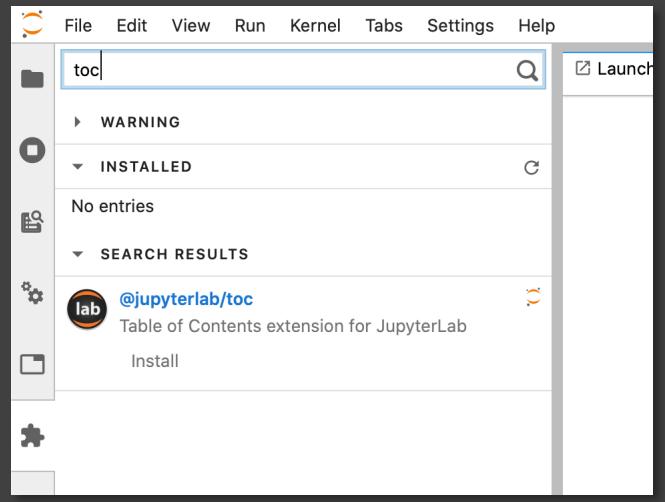
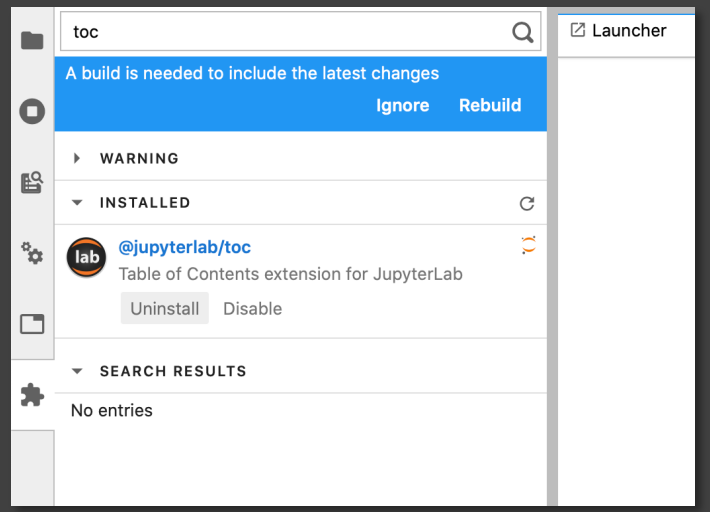
4. In the search bar, search for ”toc” and click Install
5. After installing it will prompt you to rebuild jupyterlab





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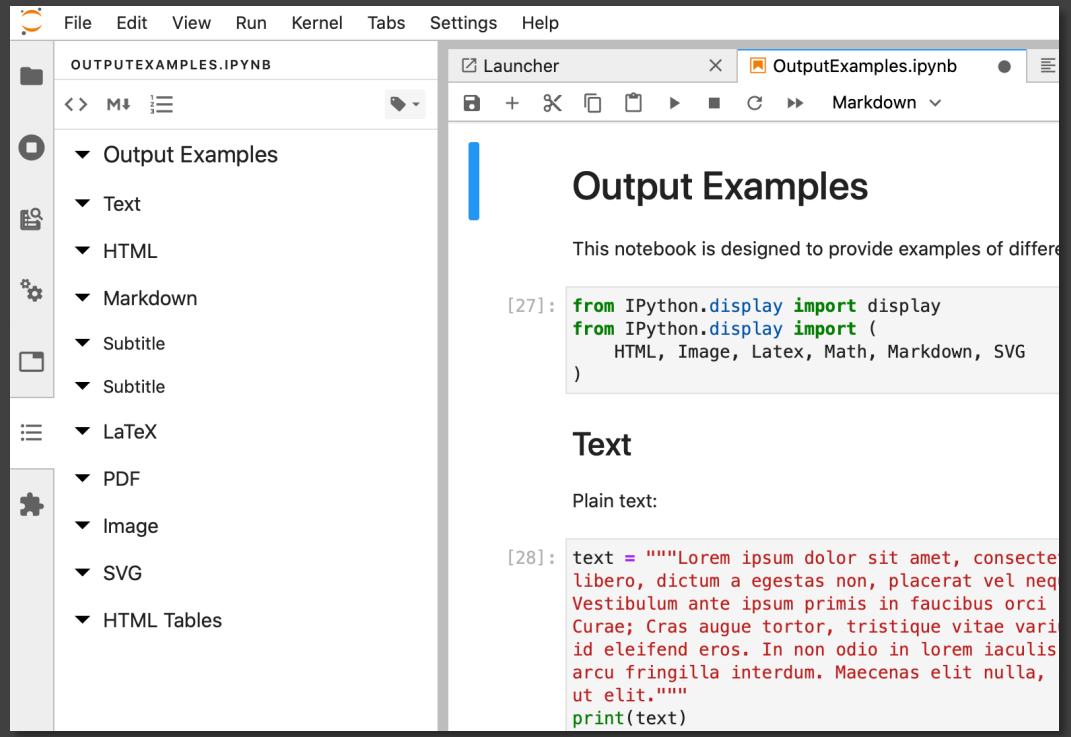
6. Once it finishes installing it will prompt you to refresh
7. After refreshing you will see the new TOC tab in your sidebar, try opening the TOC tab while a notebook, markdown, or python file is open



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8. Some extensions can't be installed via the UI. Try searching for and installing "git". It will display a message telling you that the extension requires requires a corresponding server extension.
9. For server extensions we need to install via the CLI
   1. Go back to your terminal and (double) ctrl-C lab
   2. Then install the git extension:

```
$ pip install jupyterlab-git
$ jupyter lab build
```

   3. This will install both the lab extension and the server extension. Once it's finished start JupyterLab again:

```
$ jupyter lab
```

Definitions:

labextension – front end extensions; can be installed and built via UI without restarting JupyterLab

serverextension – back end extensions; must be installed via CLI and require restarting JupyterLab

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Creating an Extension

1. Creating a new extension using the cookie-cutter

```
$ pip install cookiecutter
```

```
$ cookiecutter
https://github.com/jupyterlab/extension-
cookiecutter-ts
```

2. Customizing your extension (following the guide on the next slide)

3. Installing your extension (following the generated README)

4. Running JupyterLab with your extension

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A few quick steps to an example custom extension

- Add these dependencies to package.json

```
"@jupyterlab/apputils": "^2.0.0",
"@jupyterlab/docregistry": "^2.0.0",
"@jupyterlab/notebook": "^2.0.0",
"@lumino/disposable": ”^1.3.5”
```

- Copy button.ts in examples to src and import it in index.ts

```
import {ButtonExtension} from "./button";
```

- Add this code to the activate function in index.ts

```
let buttonExtension = new ButtonExtension();
app.docRegistry.addWidgetExtension('Notebook',
buttonExtension);
```

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Useful Links

JupyterLab Docs: https://jupyterlab.readthedocs.io/

Extension cookie-cutter: https://github.com/jupyterlab/extension-cookiecutter-ts

GitHub Topics filter for finding extensions: https://github.com/topics/jupyterlab-extension

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