Jupyter Notebook

olsen software

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Introduction to Jupyter Notebook

- Jupyter Notebook is a handy way to create a web page that combines text and Python code

- A Jupyter notebook contains:
  - Plain text (in Markdown format)
  - Other rich media (e.g. images)
  - Python code cells (other languages are also supported, e.g. R)
  - The result of running Python code (e.g. data visualizations)

- Jupyter Notebook is widely used in data science
  - A very good way to run data analysis code and show the results
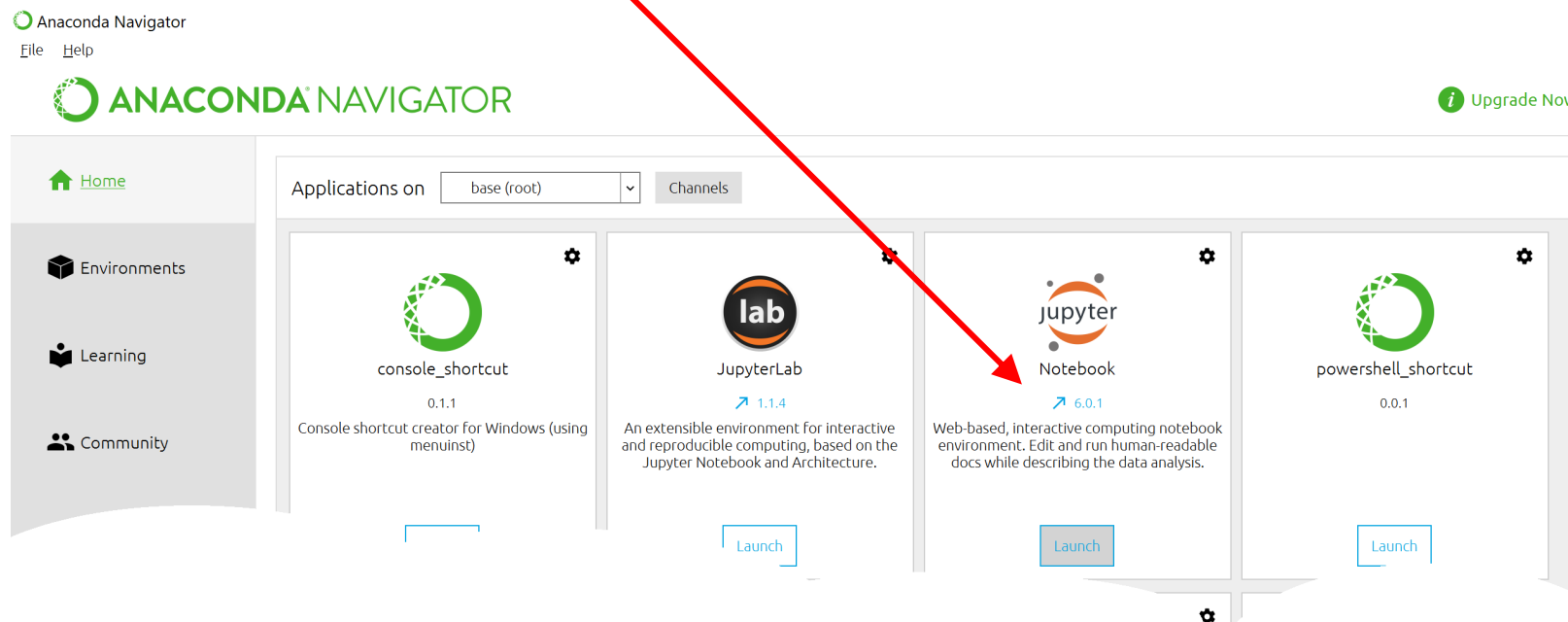
Installing Jupyter Notebook

- The easiest way to get started with Jupyter Notebook is by installing Anaconda
  - Anaconda is the most widely used Python distro for data science
  - Includes popular data science libraries (NumPy, Pandas, etc.)
  - Also has Jupyter preinstalled

- To get Anaconda:
  - Go to https://www.anaconda.com/products/individual
  - Follow the download instructions

- Alternatively you can install Jupyter separately
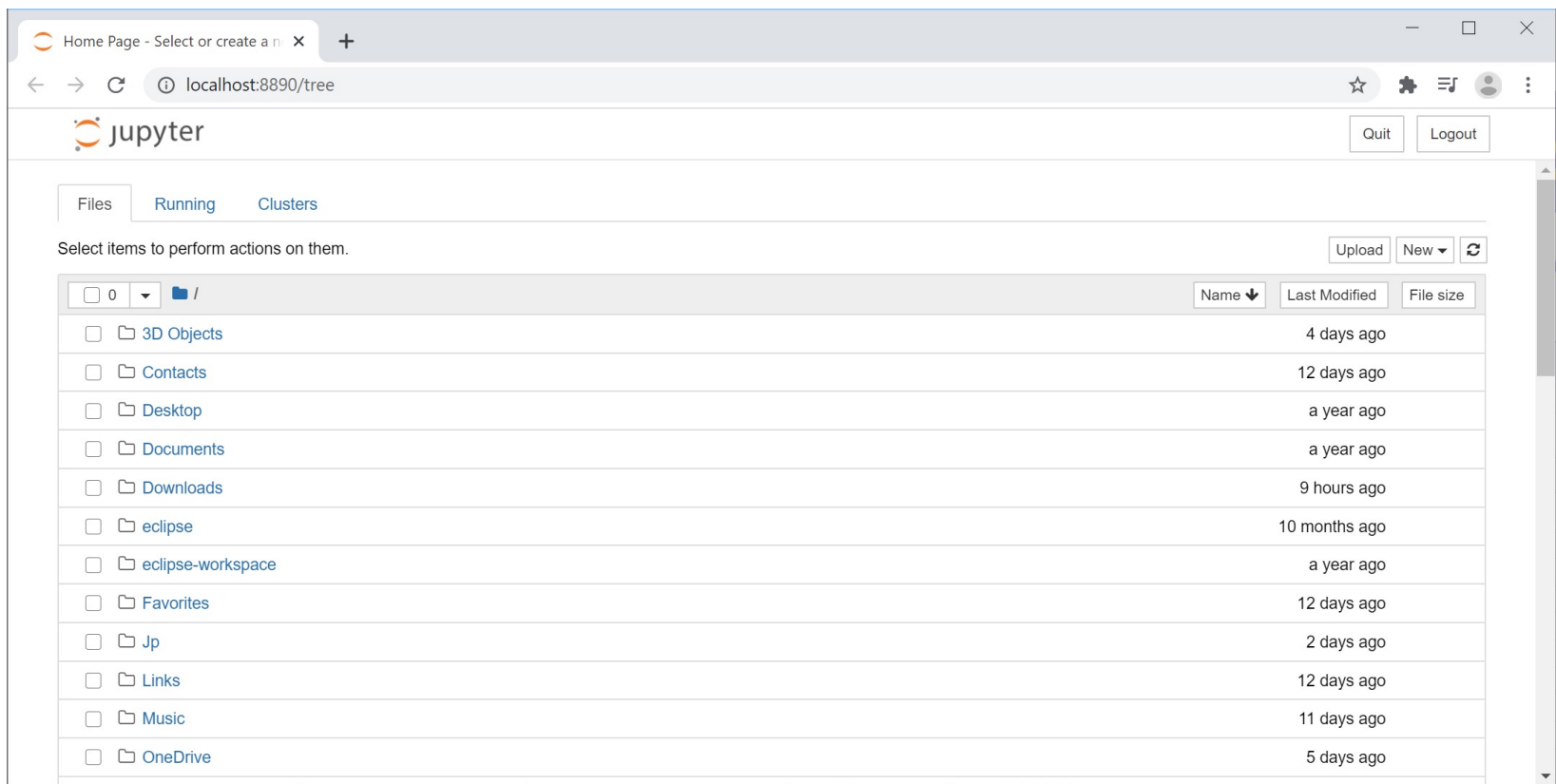
```
pip install jupyter
```

- You can run Jupyter Notebook directly, or launch it from the Anaconda Navigator window

- When you run Jupyter Notebook, a Python web server starts up
  - The web server serves up your Jupyter notebooks
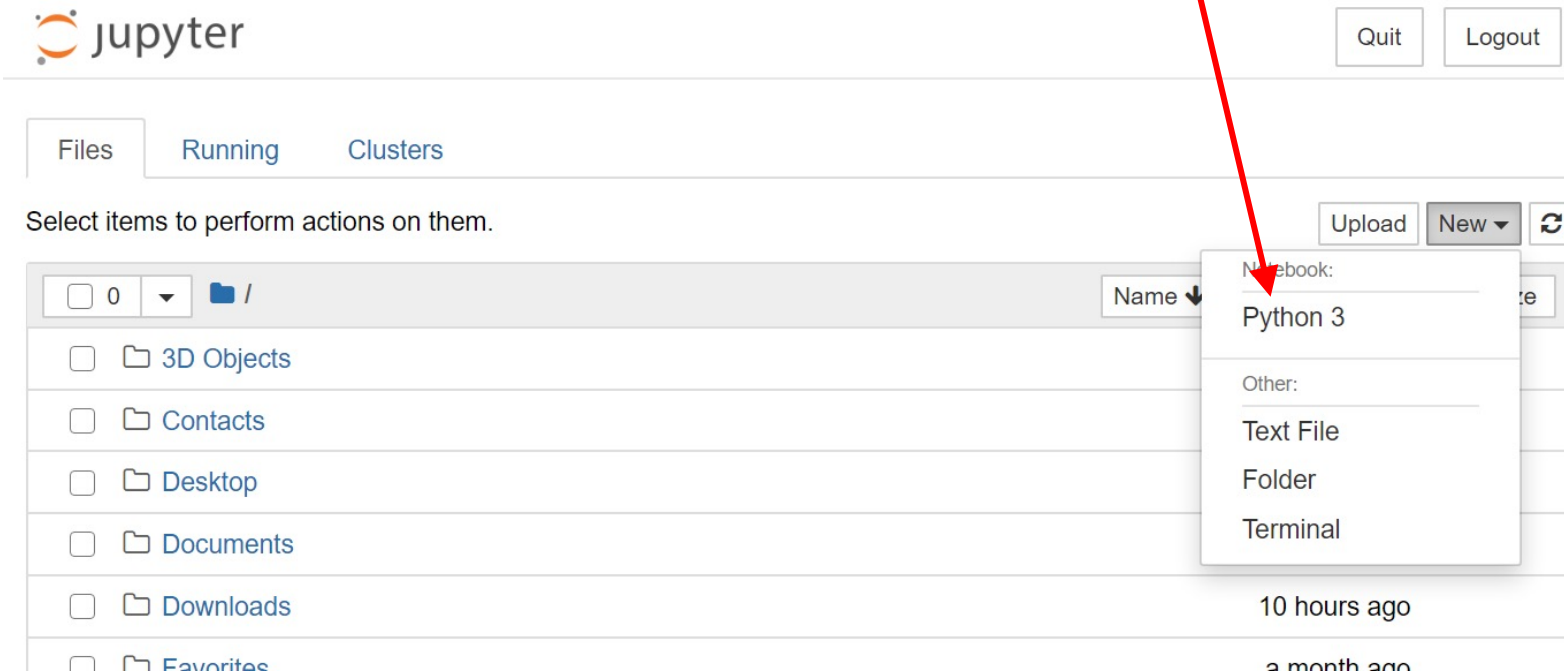 - A Jupyter notebook is actually a small web app (very portable!)

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Running Jupyter Notebook (2 of 2)

- A browser opens, e.g. to http://localhost:xxxx/tree
  - This is the Jupyter dashboard
  - Shows your home folder by default, e.g. C:\Users\Administrator

- In the Jupyter dashboard, click New | Python 3

Creating a Simple Notebook (2 of 2)

- Jupyter creates a new notebook called `Untitled.ipynb`
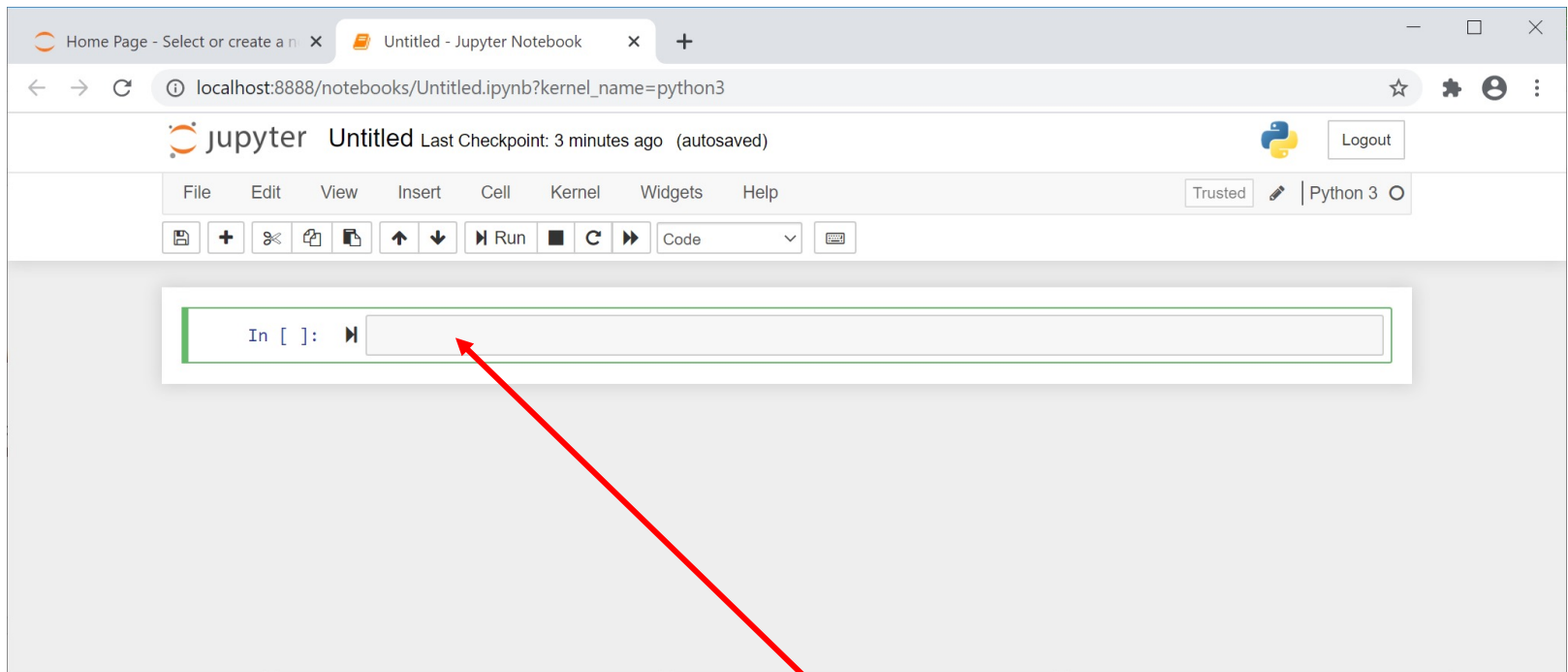
- The notebook contains a single cell initially
  - There are 2 types of cell - code or text
  - The cell here is a code cell (empty initially)
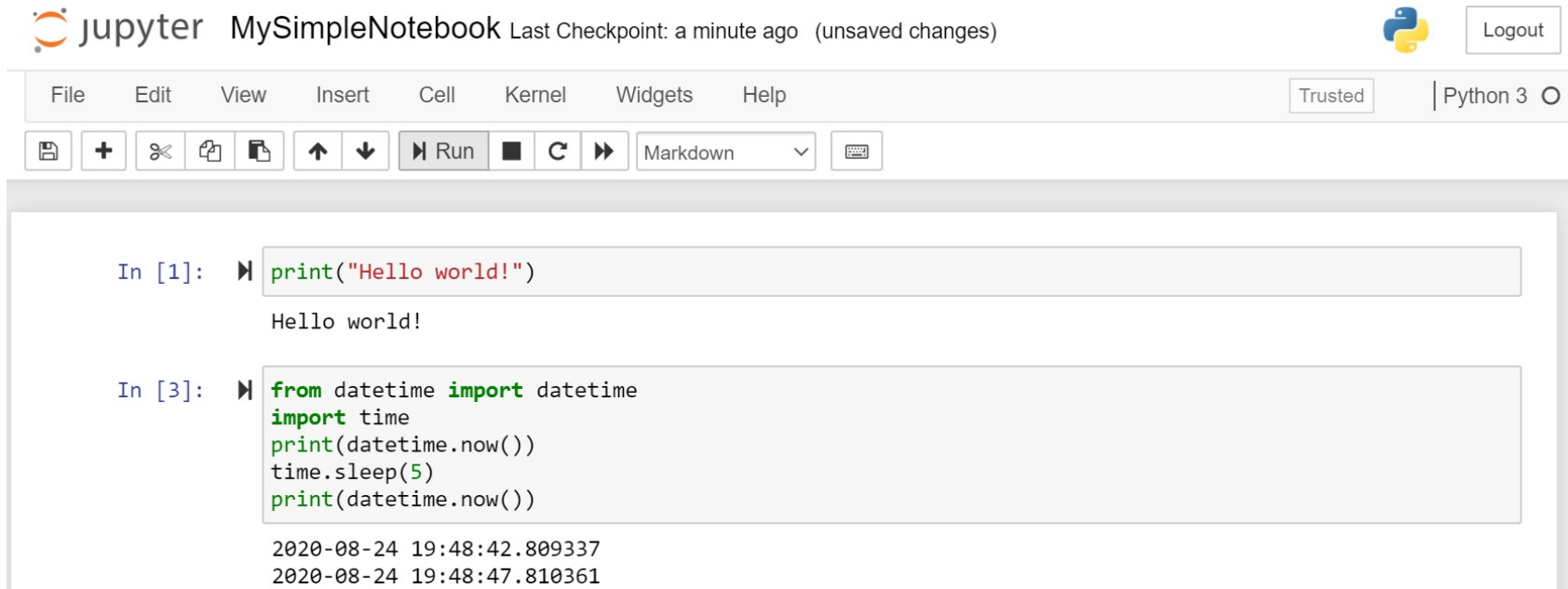
Entering and Running Code in a Code Cell

- Enter Python code in the cell, then click the Run button
  - When you run a cell, its output is displayed just beneath it
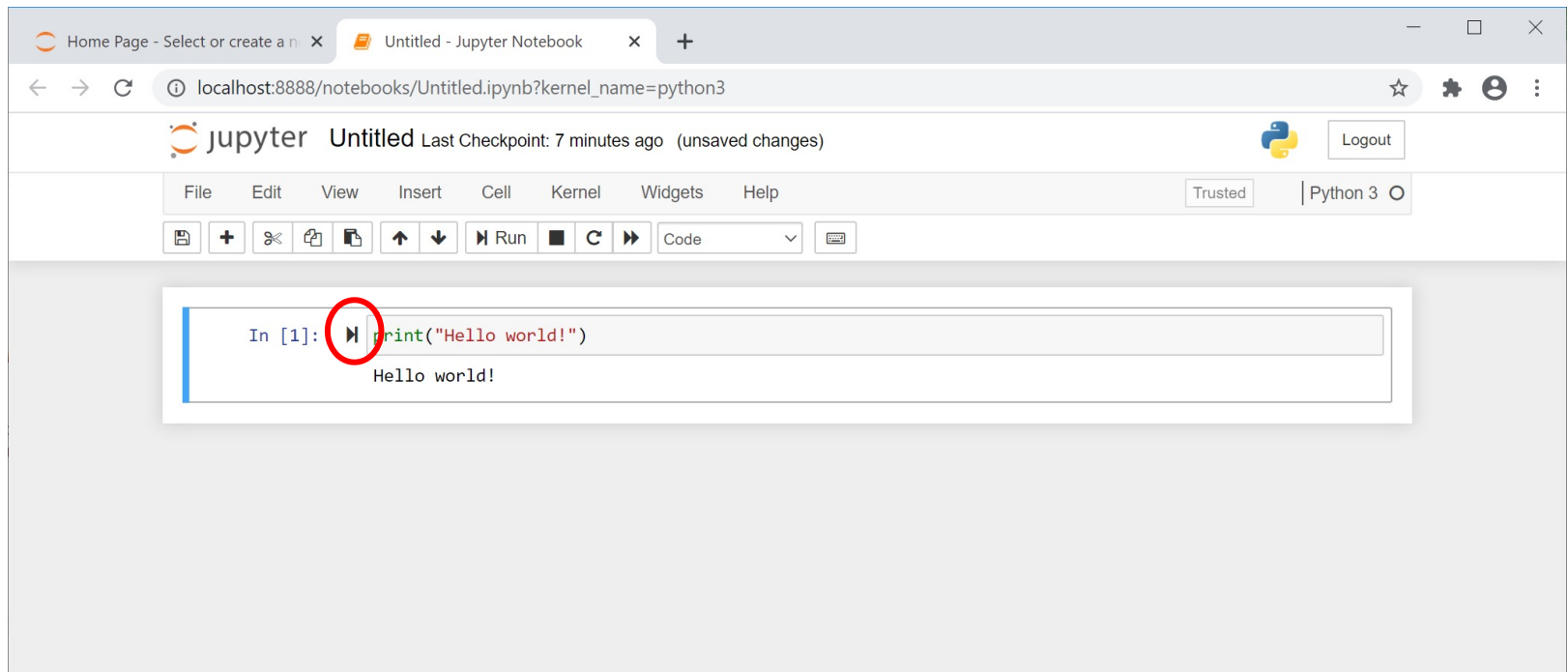
- Notice the label to the left of the cell is now In [1]
  - If you run the code again, the label changes to In [2]

Inserting a Code Cell

- To insert another code cell:
  - Click Insert | Insert Cell Below
  - Click Cell | Cell Type | Code
  - Enter code in the new cell as appropriate, and run it

Inserting a Markdown Cell

- To insert a Markdown cell:
  - Click Insert | Insert Cell Below
  - Click Cell | Cell Type | Markdown
  - Enter Markdown text in the cell, as appropriate

- Here's some sample Markdown
  - For details, see https://www.markdownguide.org/cheat-sheet/

```
# This is an H1
## This is an H2

**This is bold text**
*This is italicized text*

Ordered list:
1. First item
2. Second item
3. Third item

Unordered List:
- First item
- Second item
- Third item
```

Saving your Notebook

- It's good practice to save your notebook regularly
  - To do this, press Ctrl+S
  - This saves your notebook via the "Save and Checkpoint" command

- What is a "checkpoint"?
  - When you create a notebook, Jupyter also creates a checkpoint file
  - Located in a hidden subdirectory named `.ipynb_checkpoints`

- What's the point of the "checkpoint"?
  - Jupyter autosaves your notebook every 2min to the checkpoint file, without altering your actual notebook file
  - When you do "Save and Checkpoint", Jupyter updates both the primary file and the checkpoint file

Renaming your Notebook

- The notebook is currently named `Untitled.ipynb`
  - You probably want a better name ☺

- Interestingly you can't rename a notebook while it's running (remember, a notebook is a mini web app)
  - You have to shut it down first, via File | Close and Halt
  - This takes you back to the Jupyter dashboard

- You can now rename the notebook file in the dashboard
  - Select the notebook in the dashboard
  - Then click Rename in the dashboard controls

Any Questions?