

Introduction to Jupyter Notebooks

A Tool for Interactively Developing and Presenting Data Science Projects

What is a “notebook”?

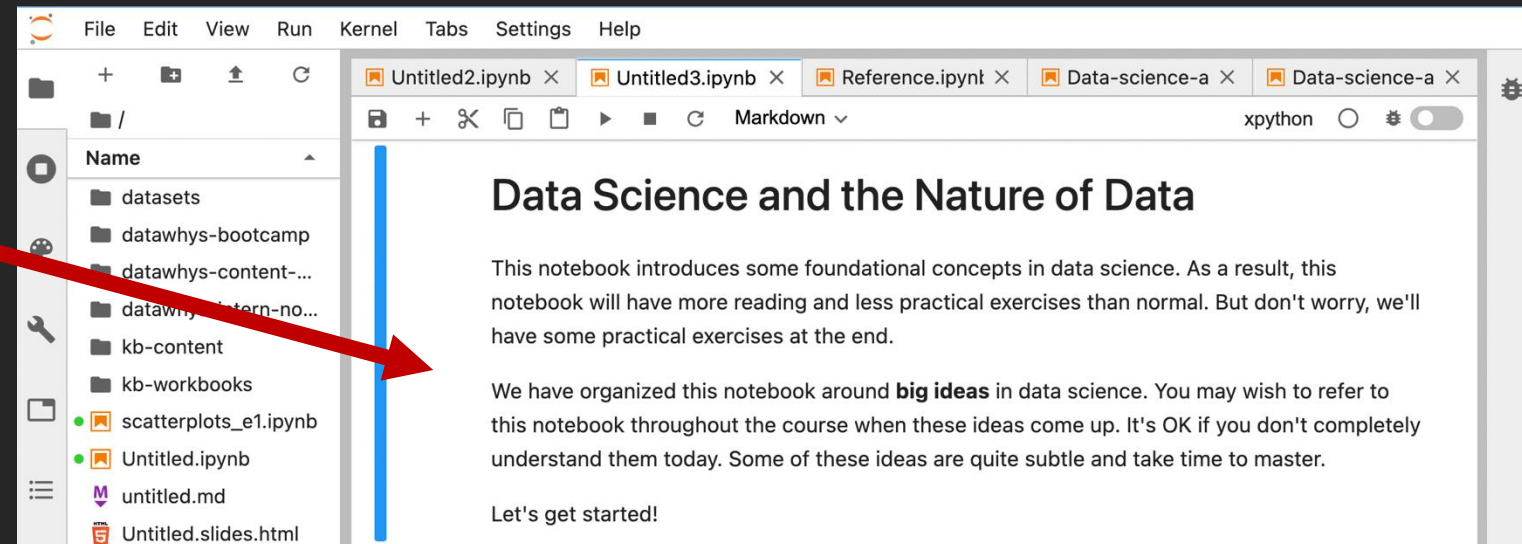
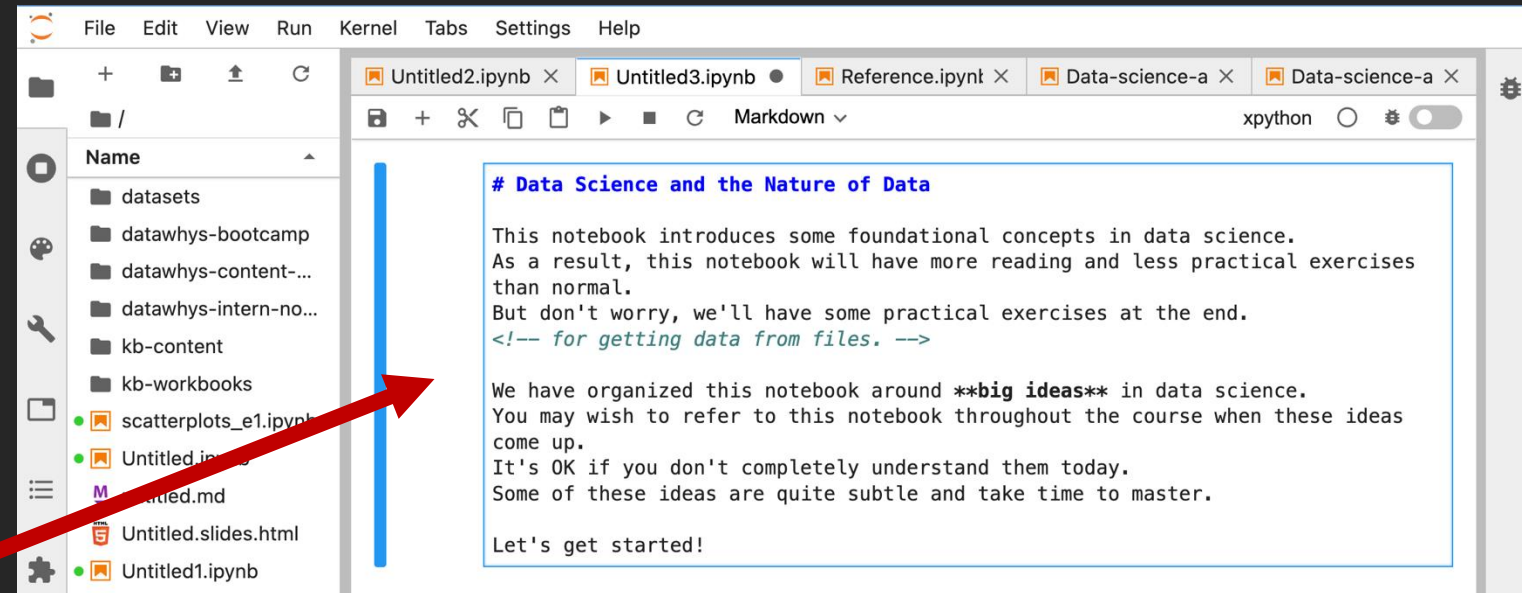
- It is a **computational document**.
- Computational documents allow users to create a single file with:
 - Prose elements
 - Images
 - Embedded code fragments
 - Code execution outputs
 - Formulas
 - Charts
- How are these elements combined?

Cells

- Each notebook is made up of distinct **cells**
- Each cell is **executable**
- Each cell has a **cell-type**
- Cells of different types can be used to make different document elements
- Two main types of cells:
 - **Markdown cells**
 - **Code cells**

Markdown Cells

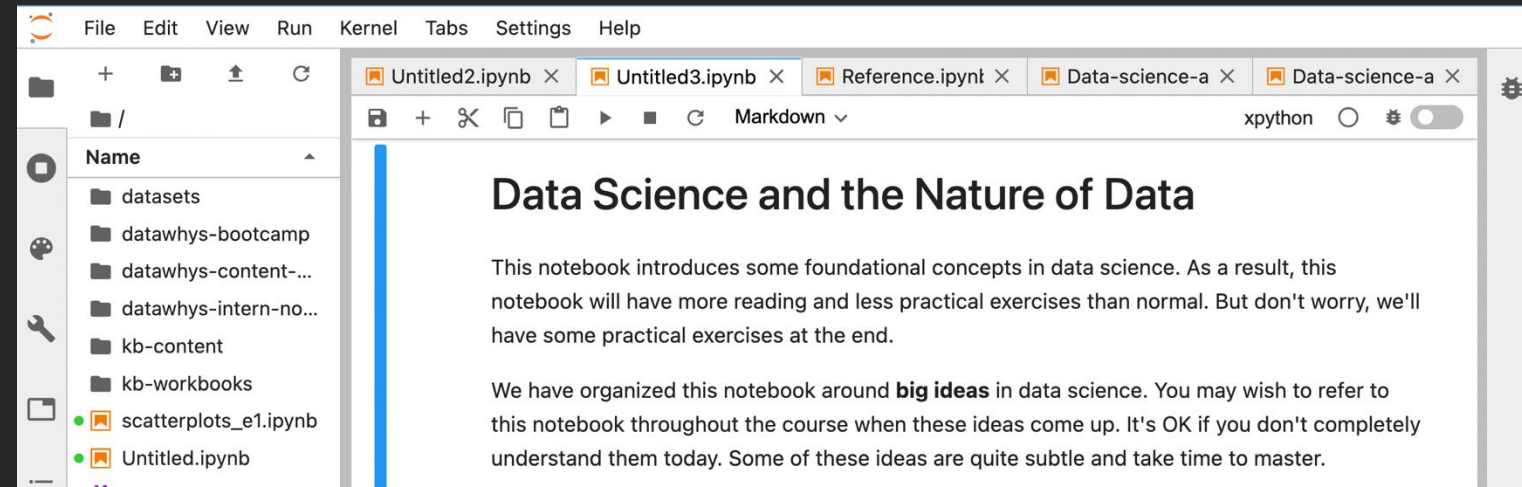
- Contain:
 - Prose in Markdown syntax
 - HTML
 - LaTeX formulas
- Editor View
- Rendered View



How-to: Switch Between Editor & Render View

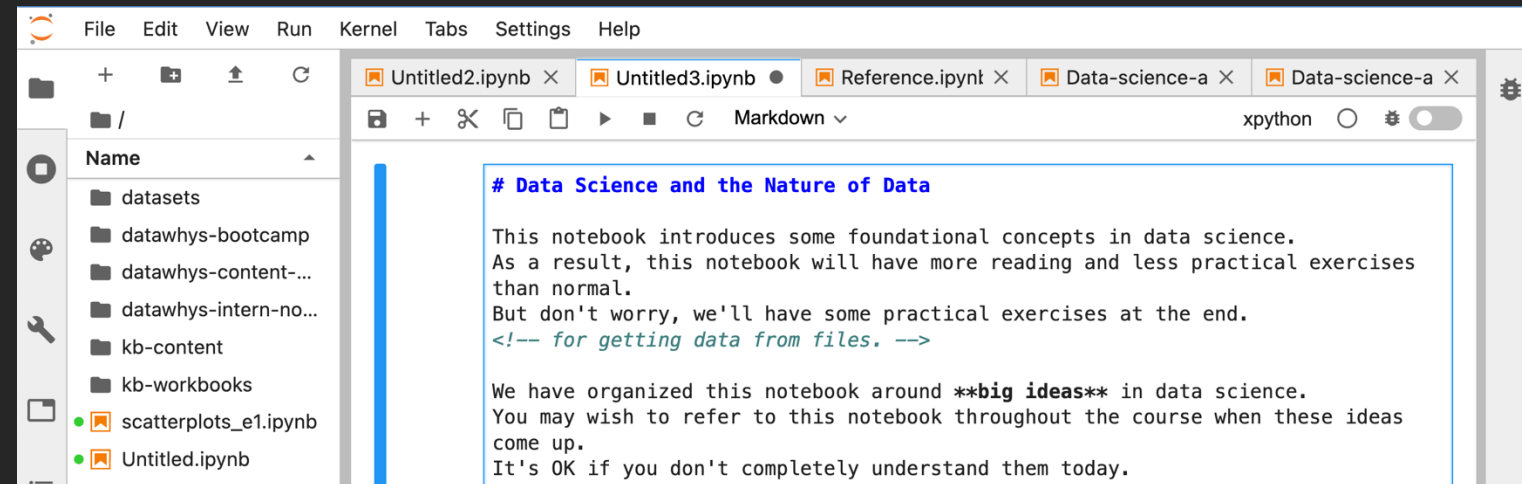
Render to Editor:

1. Double-click inside cell



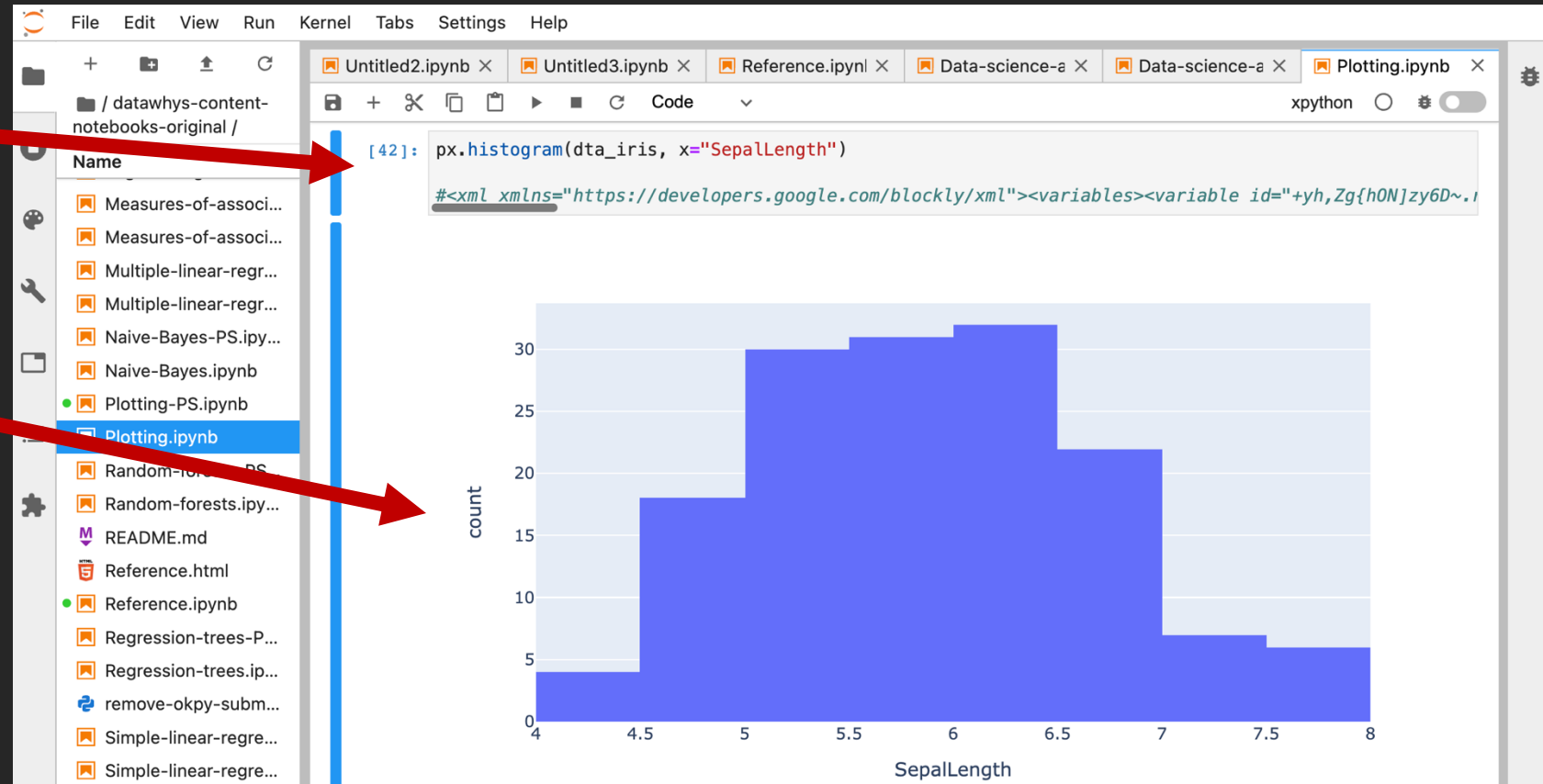
Editor to Render:

1. Run the cell



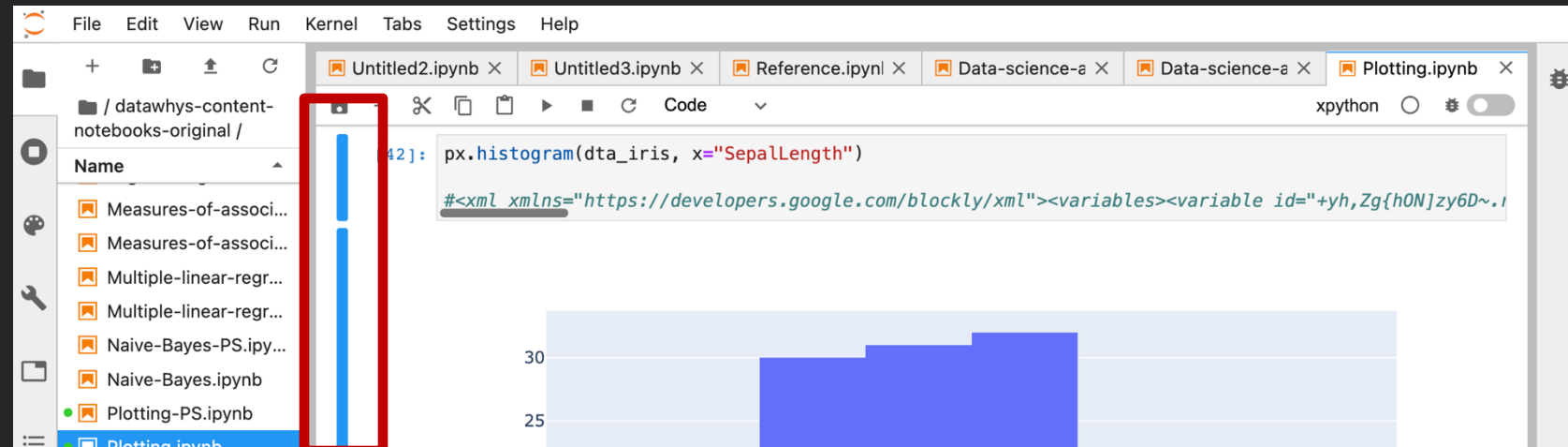
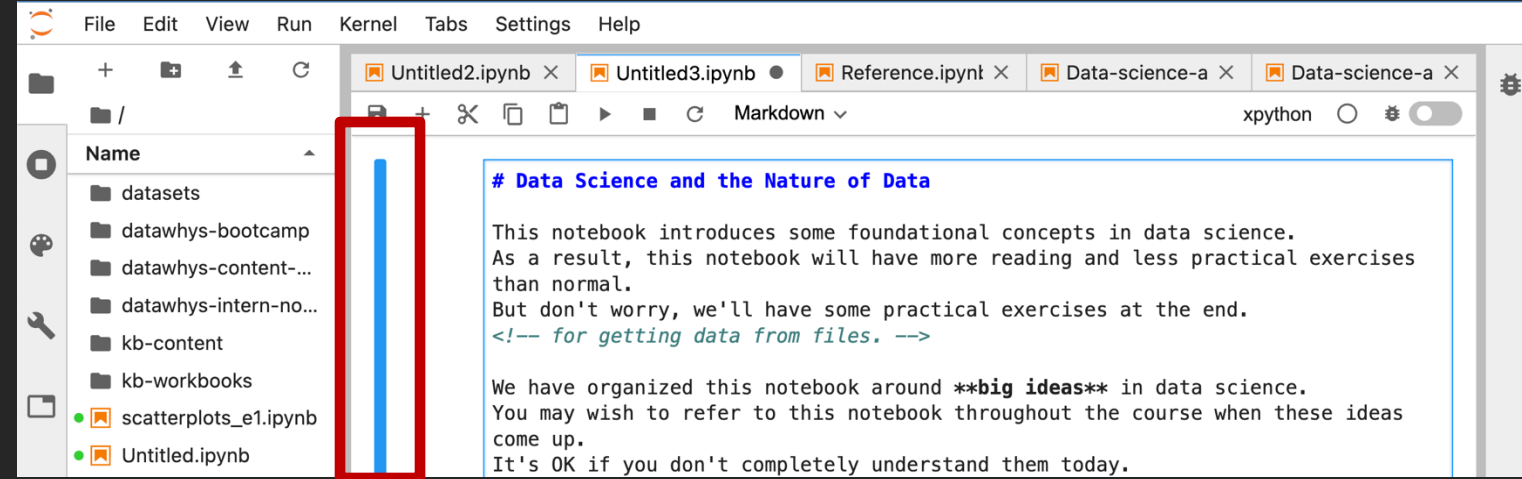
Code Cells

- Code Input
 - Python code
 - Blockly xml tag
- Code Output
- Code cells in same notebook have shared memory stack (**Kernel**)



Currently Active Cell

- Indicated by blue bar to left of cell
- Click inside cell or surrounding area to make a cell active
- Only one cell is ever “active” at a time

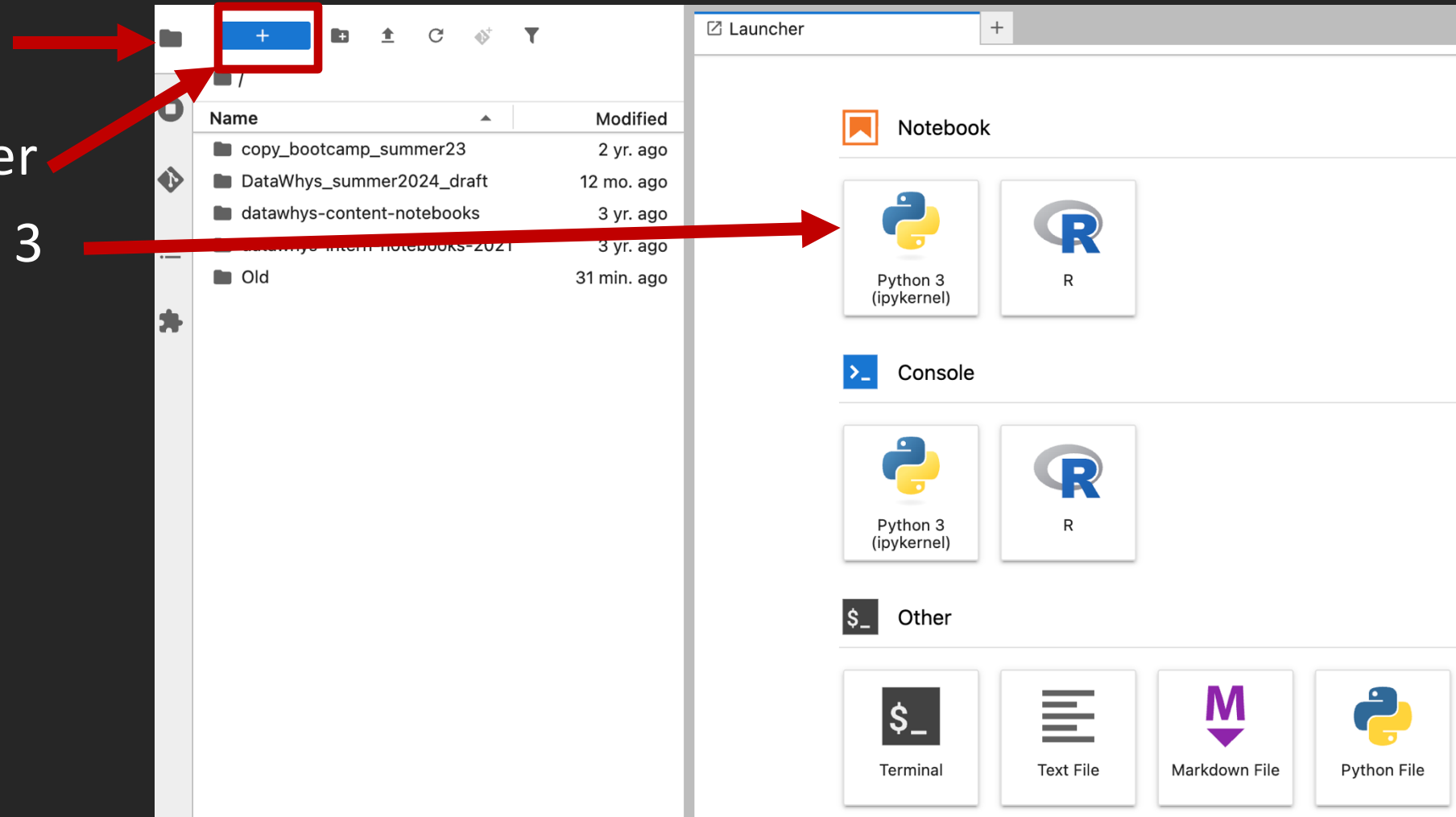


Activity 1: Print Your Name

1. Open provided file **your_name.ipynb**
2. Observe current value of variable **your_name** in cell 1
3. Select “Run All Cells” from Run Menu
4. Observe outputs of cells 2 and 3 match preset **your_name** value
5. Change value of **your_name** in cell 1
6. Select “Run All Cells” from Run Menu
7. Observe the changes to the cell outputs
8. Show your work to one of the instructors/mentors

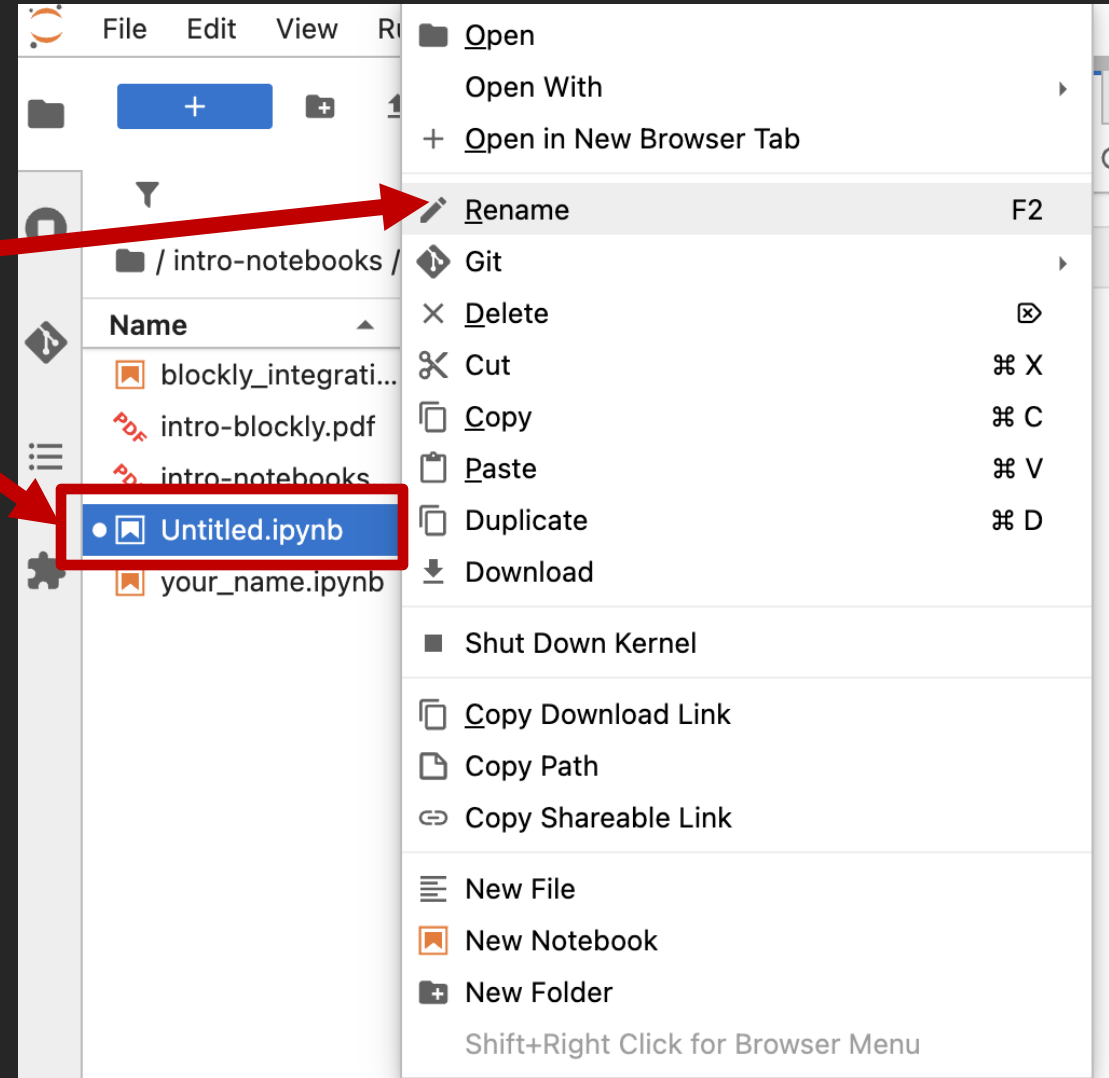
How-to: Create a Notebook

1. Open File Browser
2. Open Launcher
3. Select Python 3 (ipykernel)



How-to: Rename a Notebook

1. Right click on the notebook
2. Rename
3. Hit Enter

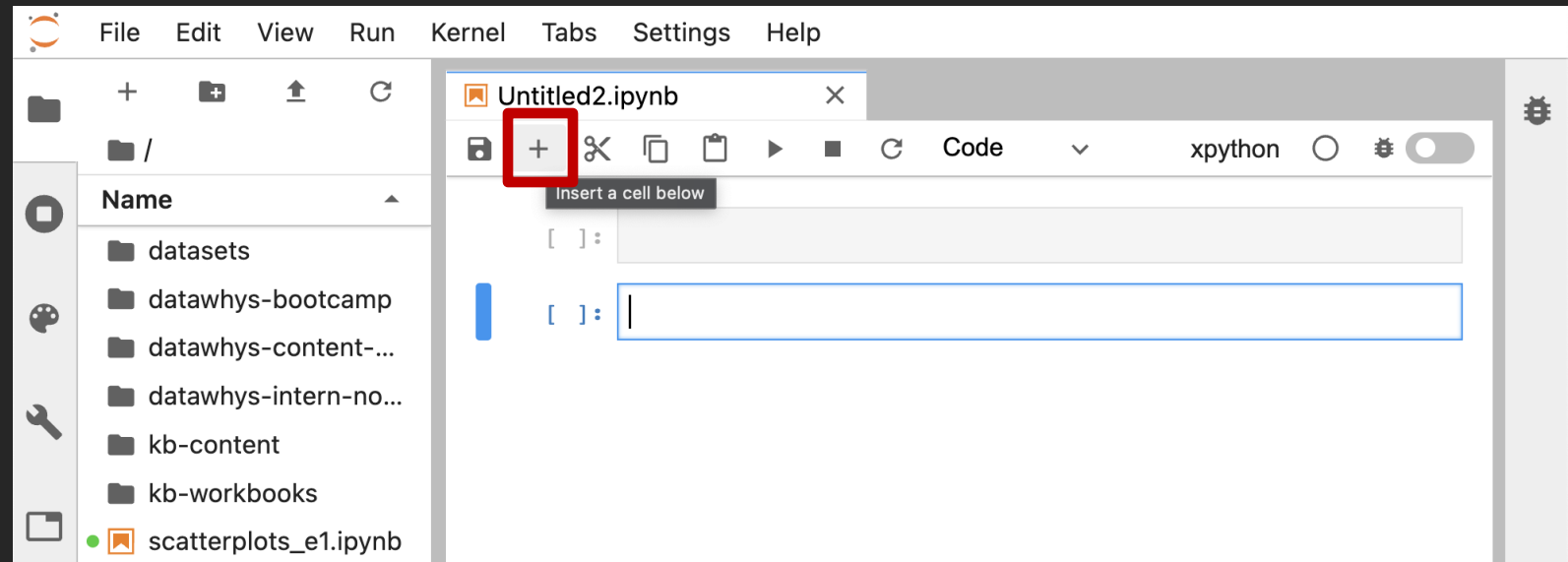


How-to: Create a Cell

From .ipynb file editor:

A. Click  to **insert** a new cell

This will insert a **Code-type cell** below the currently active cell.

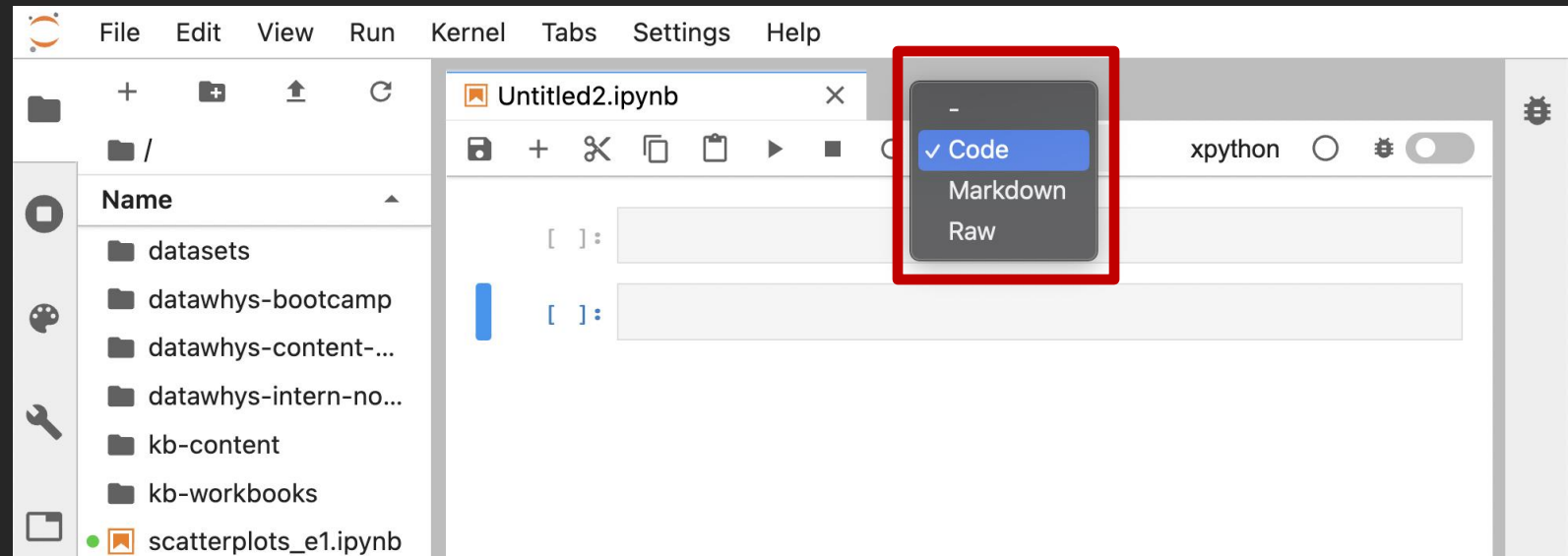
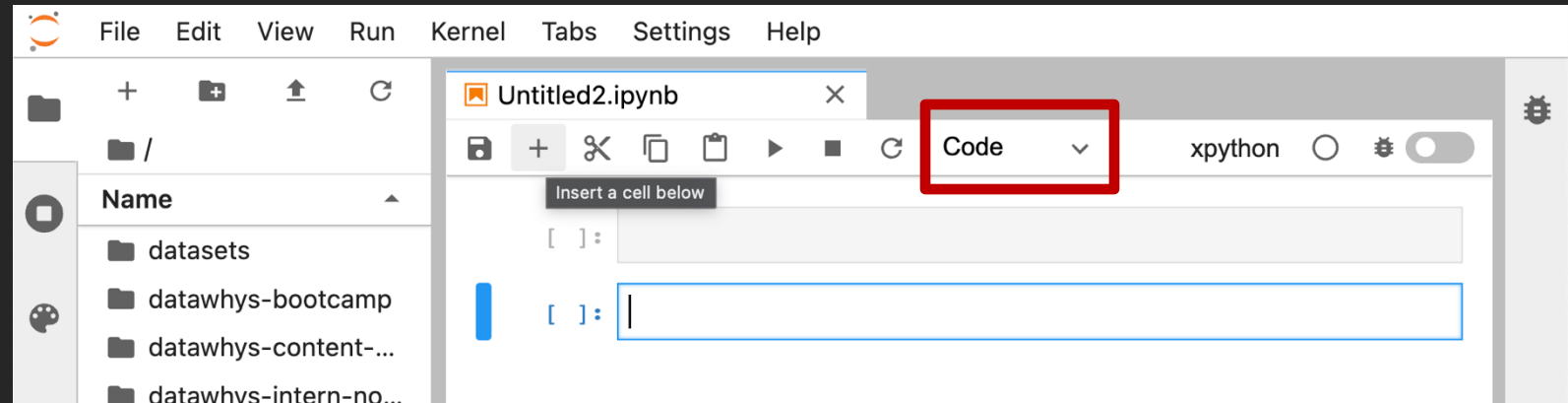


How-to: Change Cell-type

From .ipynb file editor:

1. Open cell-type dropdown
2. Select new cell-type

This will change the type of the currently active cell.

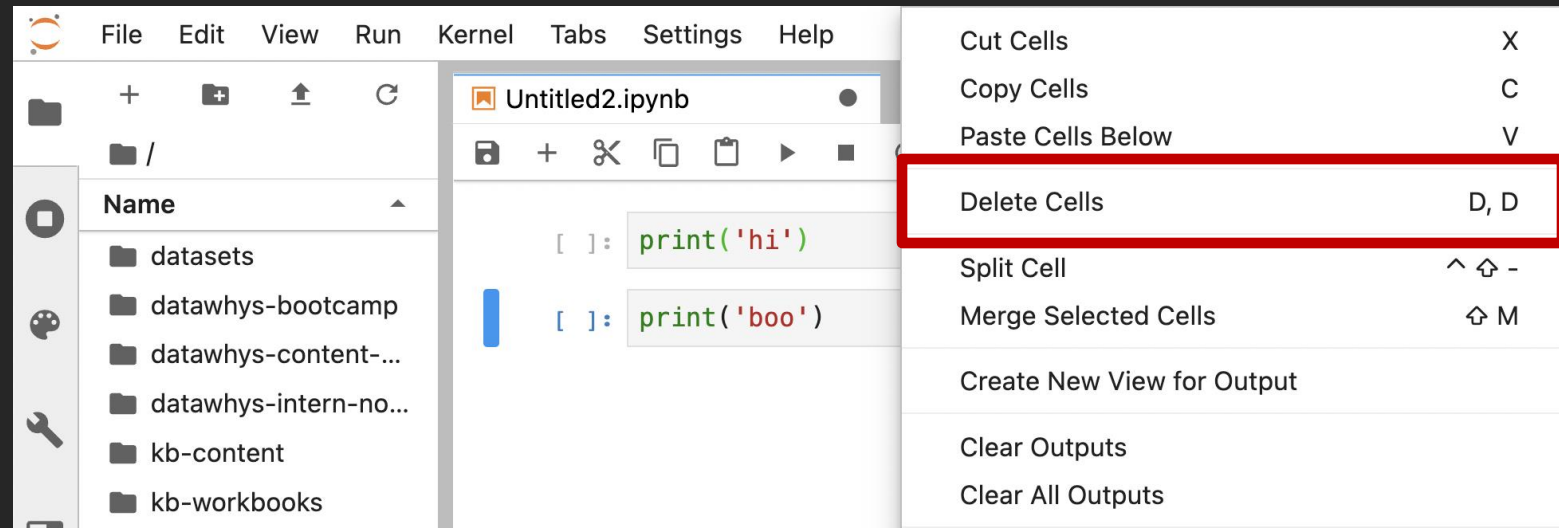


How-to: Delete a Cell

From .ipynb file editor:

1. Right-click inside cell area
2. Select “Delete Cells”

This will delete the currently active cell.



How-to: Run Currently-Active Cell

From .ipynb file editor:

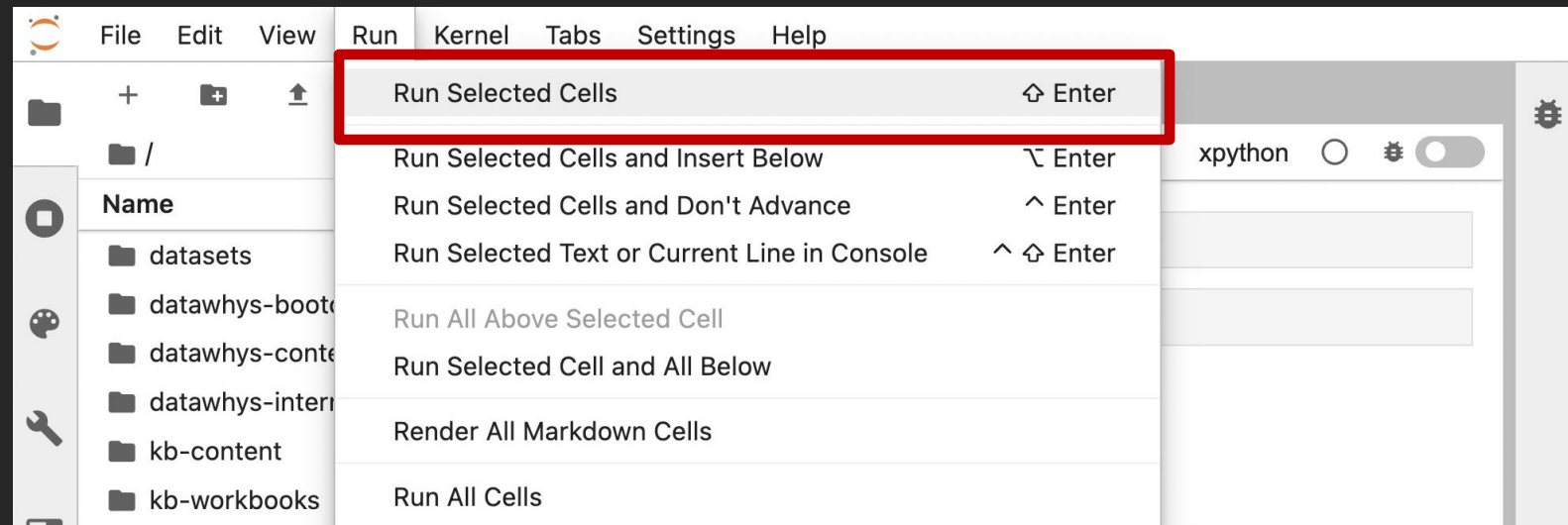
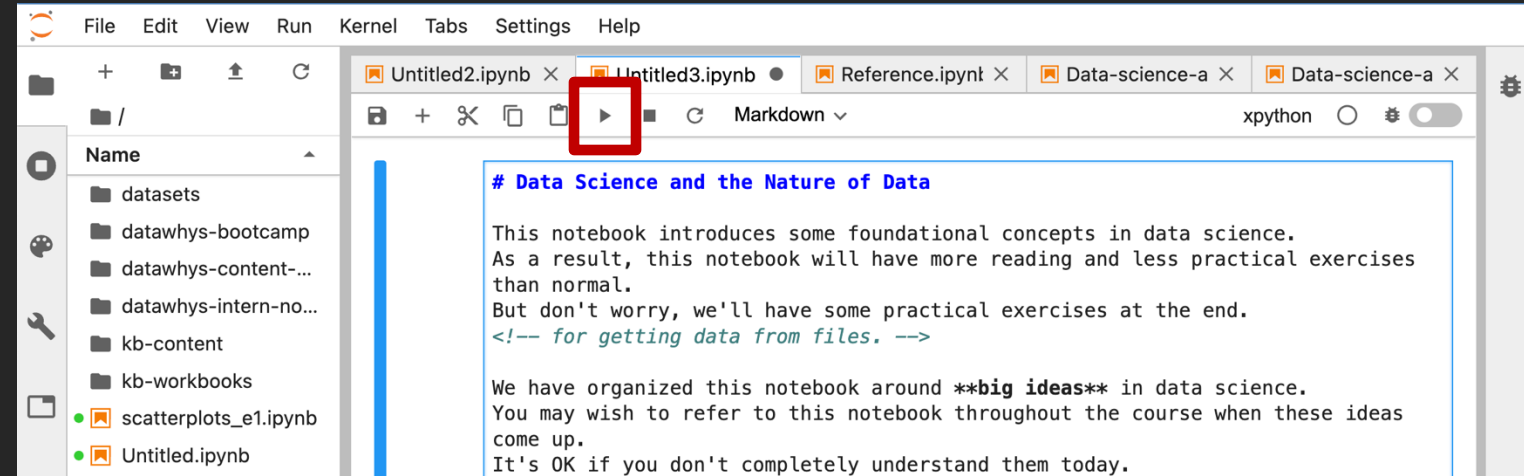
1. Key press SHIFT-Enter

OR

1. Click the  button

OR

1. Open Run Menu
2. Click “Run Selected Cells”



Activity 2: Create a Notebook

1. Create a new notebook
2. Rename the new notebook **age_to_seconds.ipynb**
3. Edit the notebook so it contains only the following 2 cells (in order):
 1. A Markdown cell with **# Age in Seconds Calculator**
 2. A Code cell with **<your age> * 365.25 * 24 * 60 * 60**
(e.g. $75 * 365.25 * 24 * 60 * 60$)
*You can use a fake age, but not same as example (75).
4. Run both cells
5. Show your work to one of the instructors

Summary

- Computational documents
- Cells and cell-types
- How to perform basic operations in a Jupyter Notebook