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**
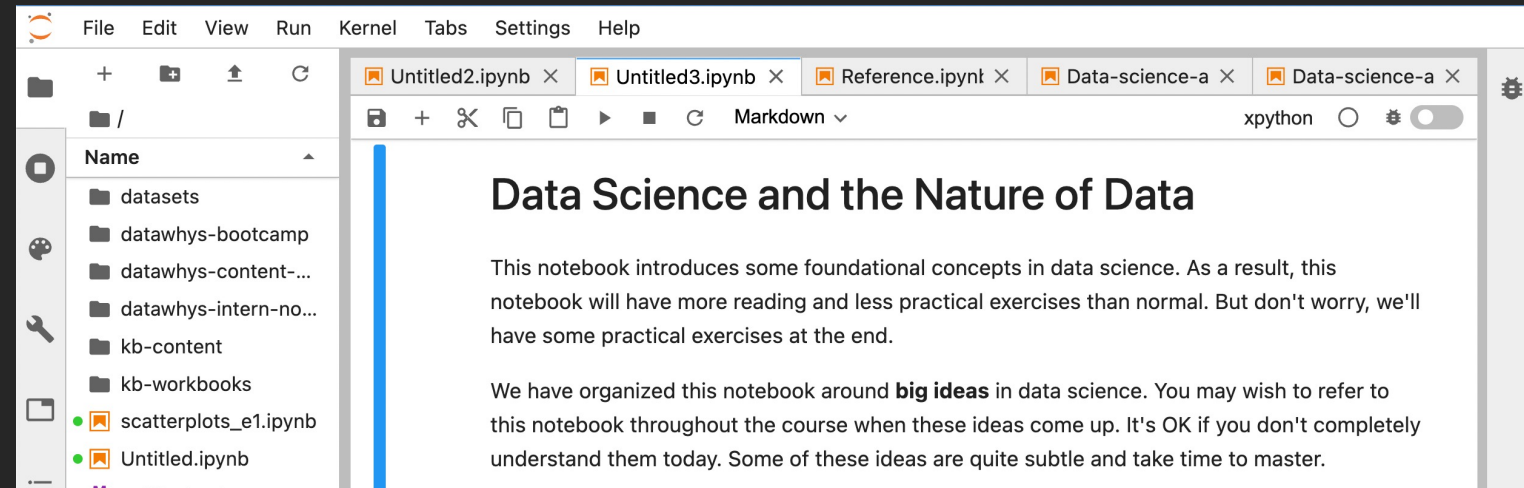 - **Code cells**

Markdown Cells

- Contain:
  - Prose in Markdown syntax
  - HTML
  - LaTeX formulas
- Editor View
- Rendered View
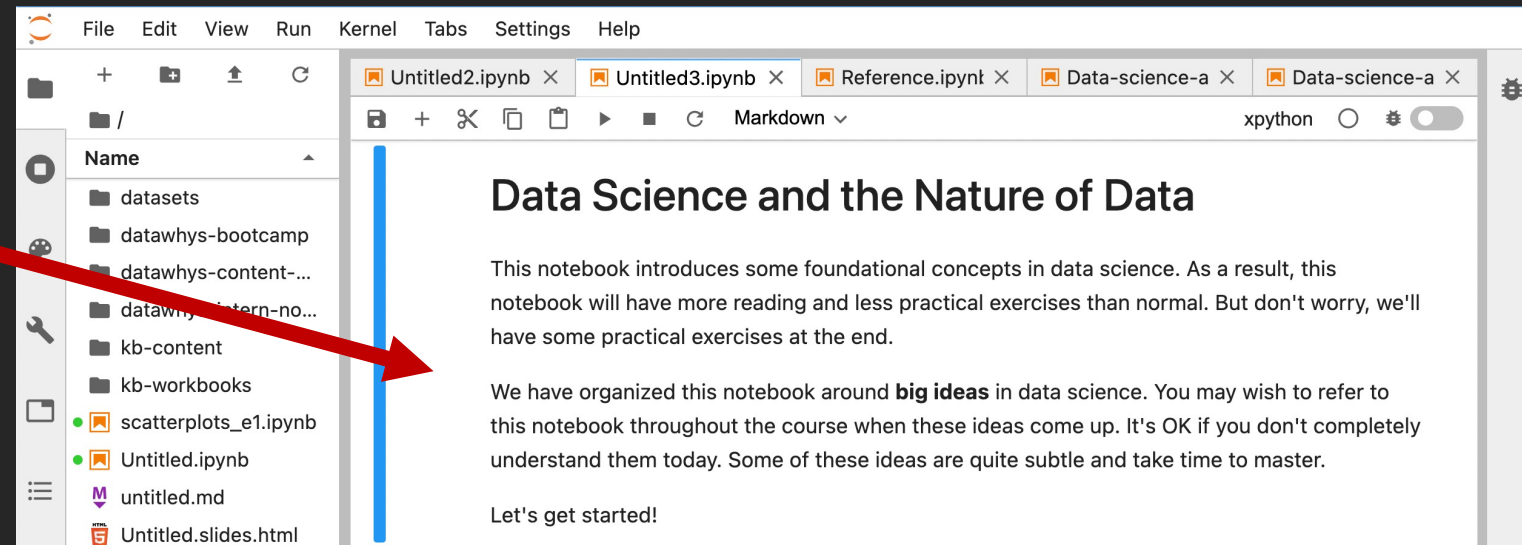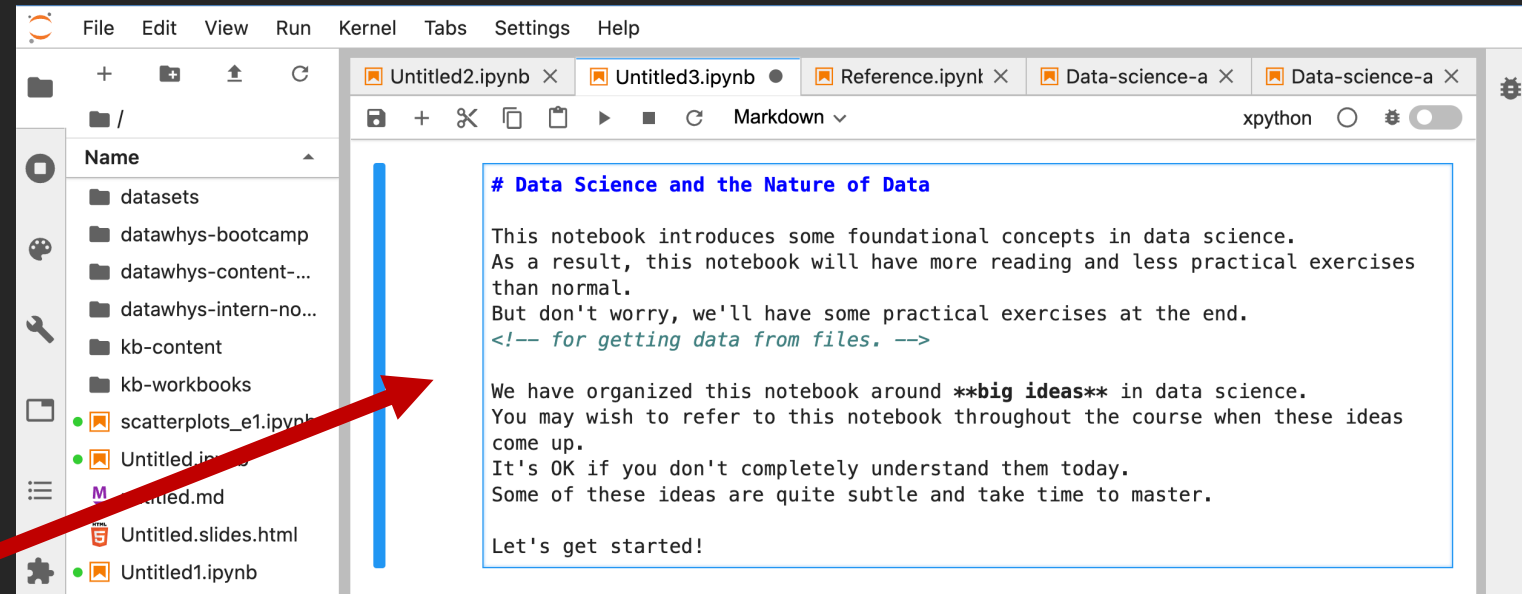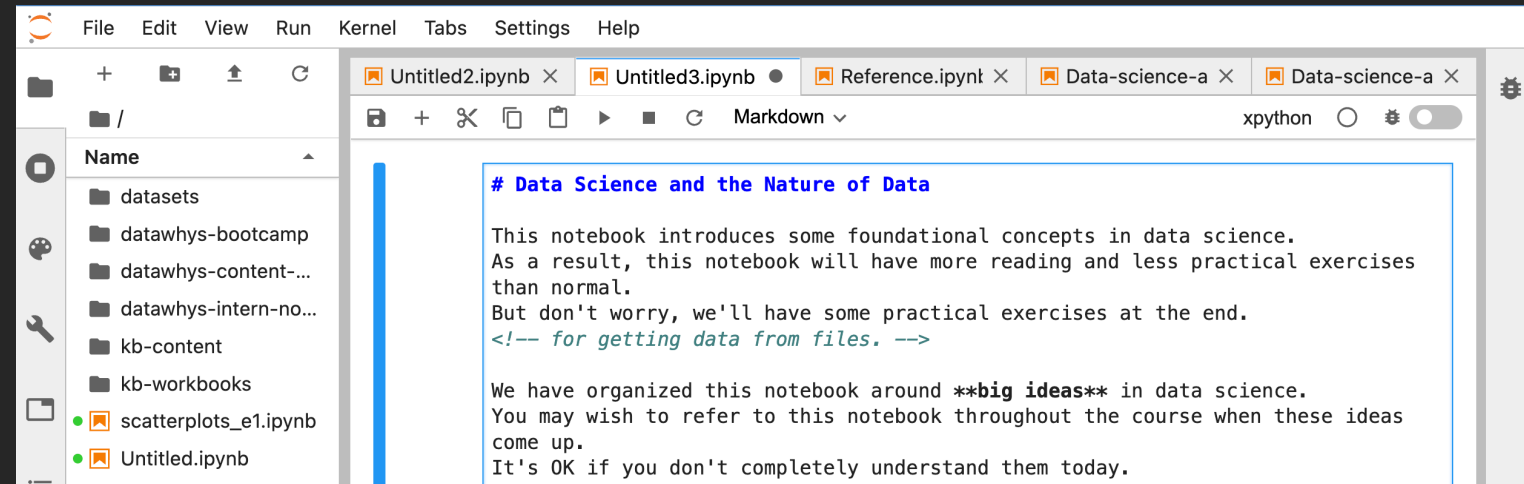
How-to: Switch Between Editor & Render View

Render to Editor:

1. Double-click inside cell

Editor to Render:
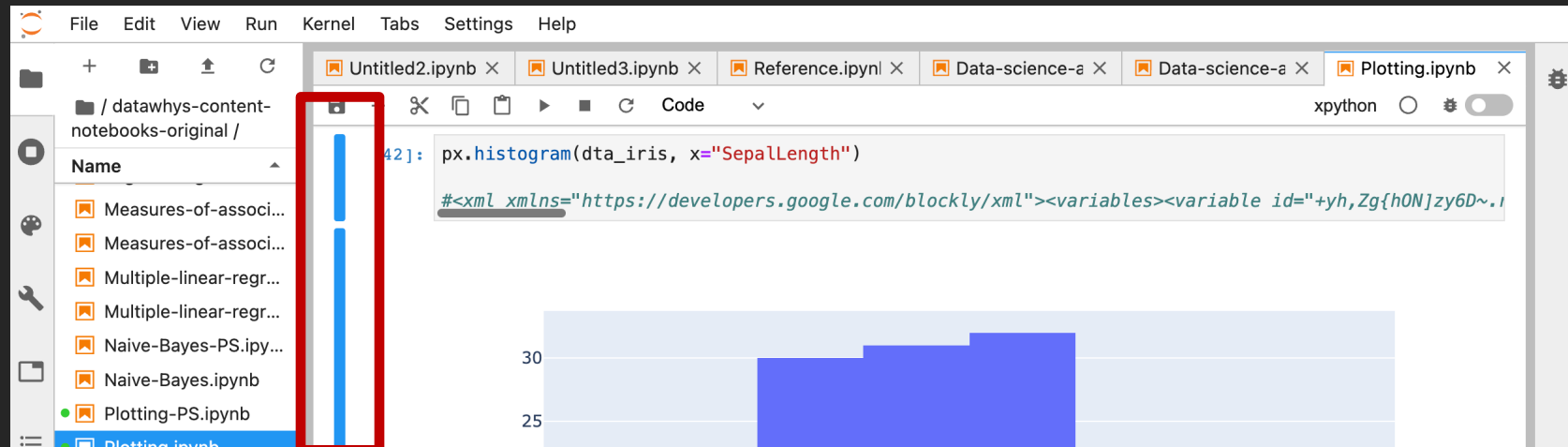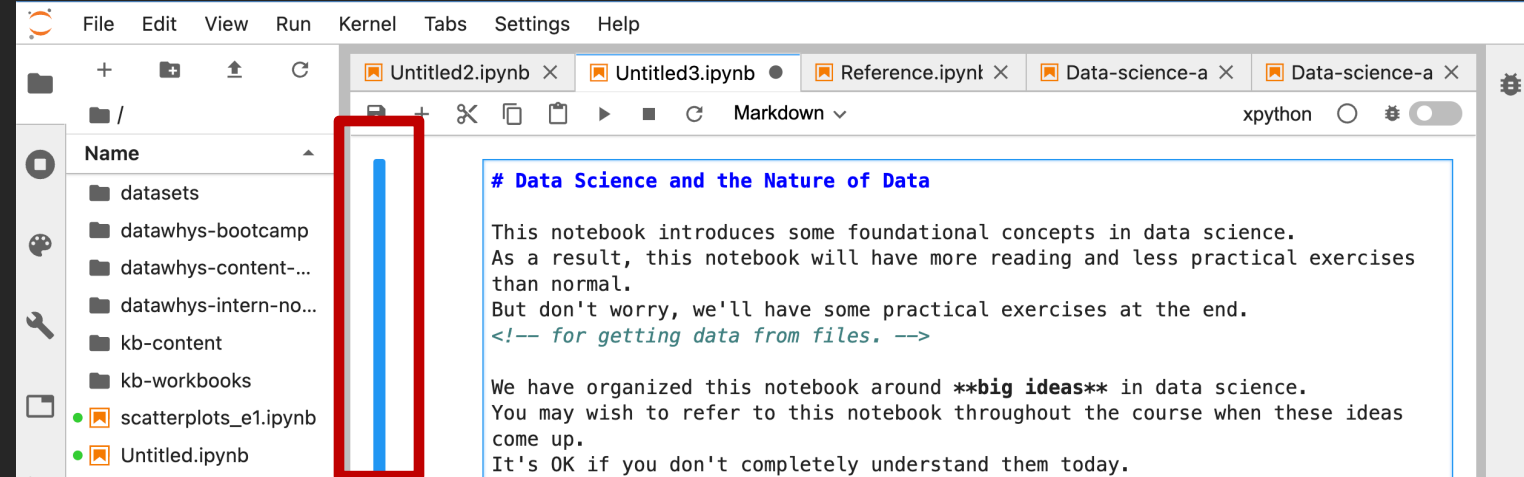
1. Run the cell

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. Upload a screenshot of your new outputs to Discord

How-to: Create a Notebook

1. Open File Browser
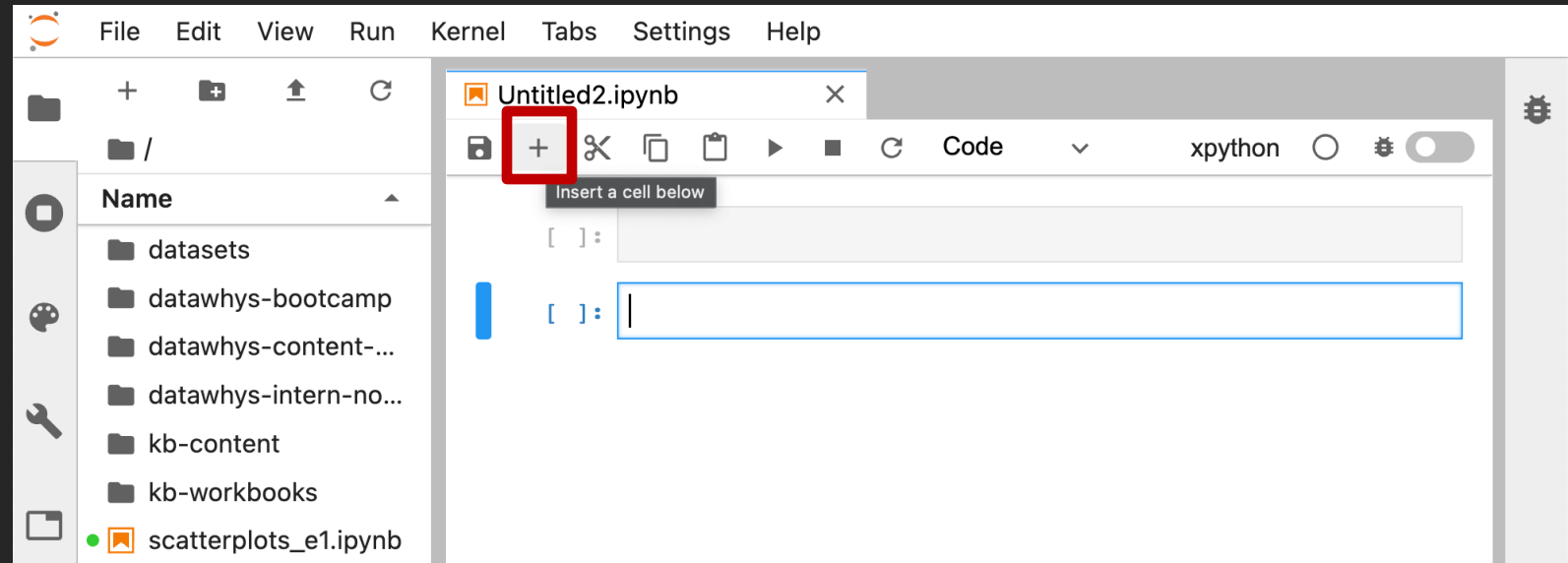2. Open Launcher
3. Select xpython
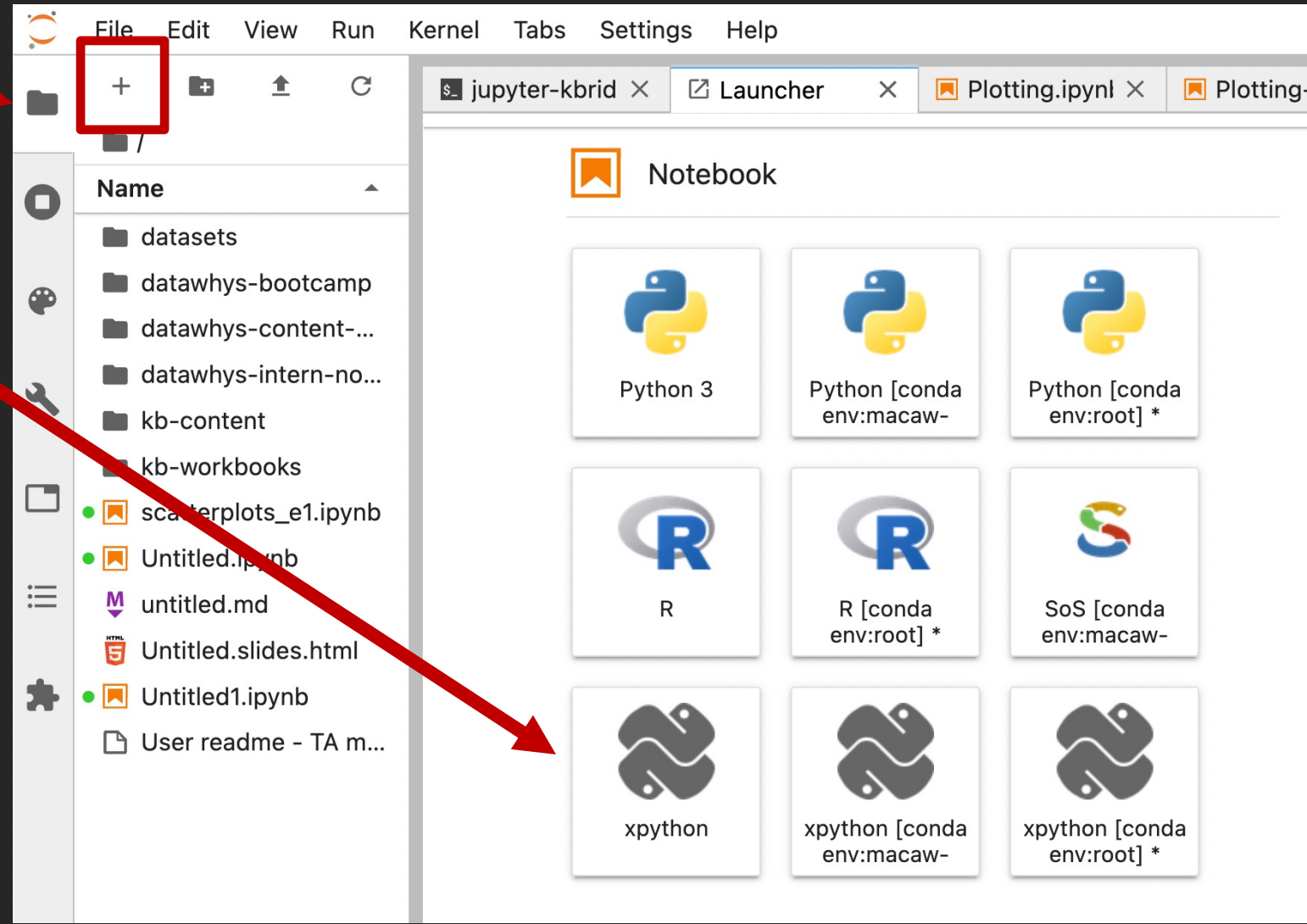
How-to: Create a Cell

From .ipynb file editor:

1. Click ➕ to **insert** a new cell

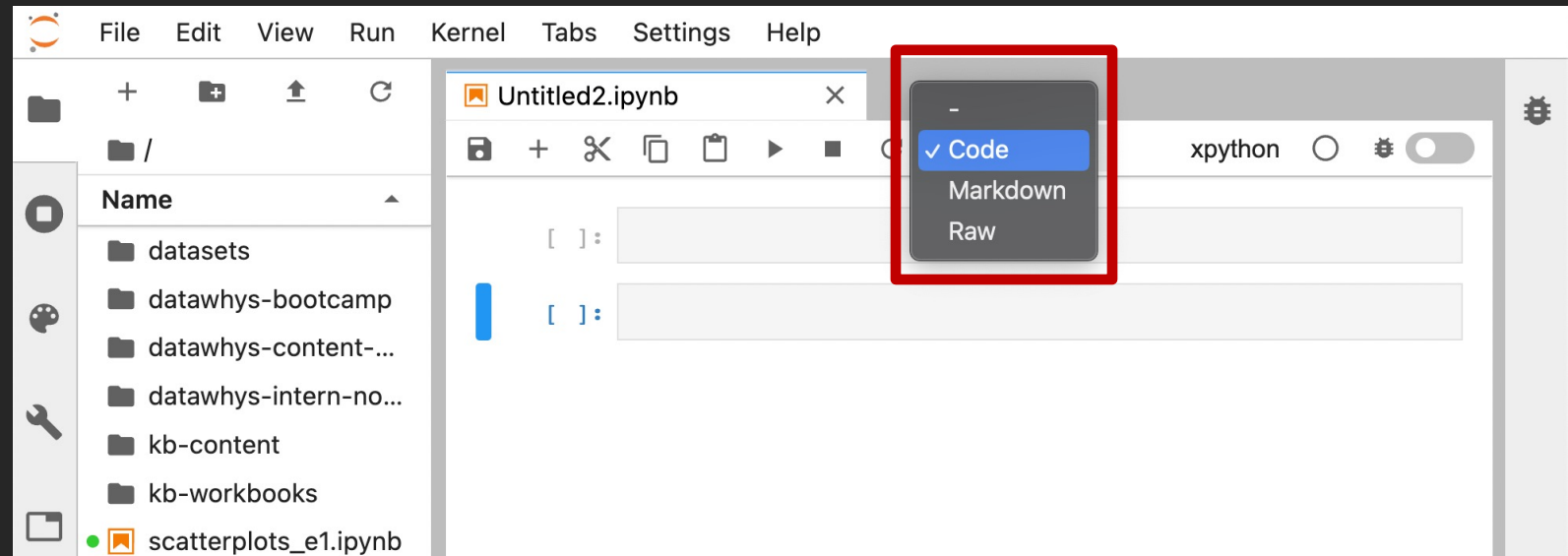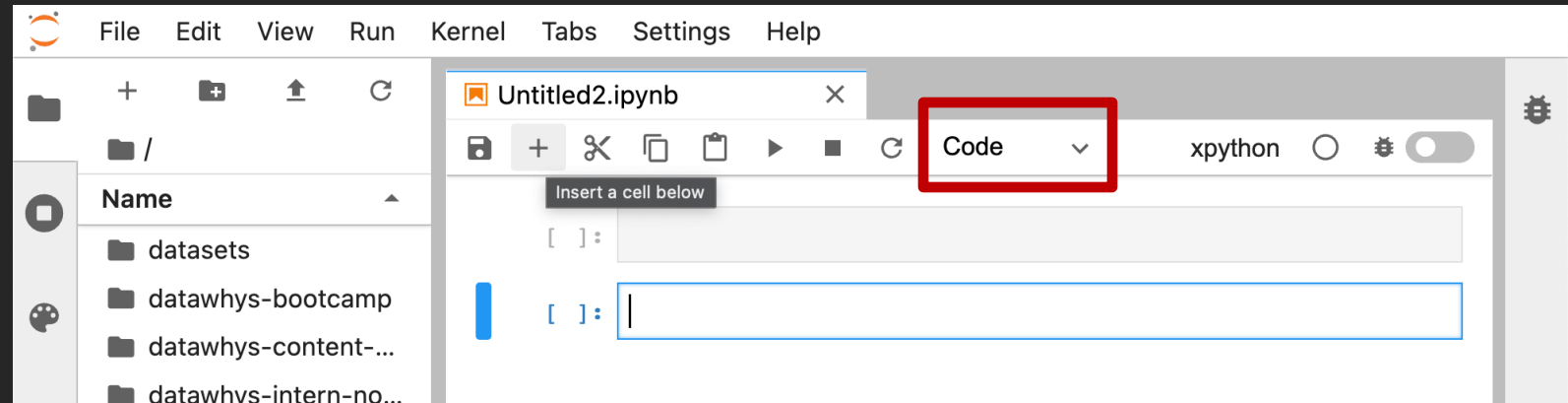This will insert a **Code-type cell** below the currently active cell.

How-to: Change Cell-type

From .ipynb file editor:

1. Open cell-type dropdown

2. Select new cell-type

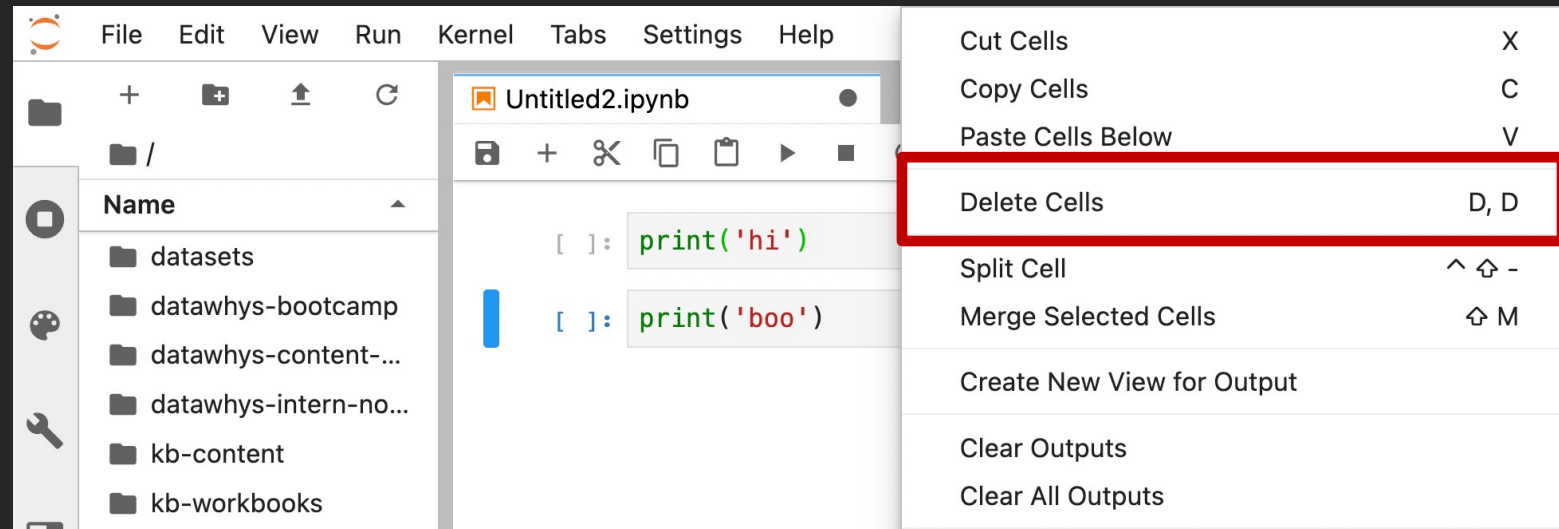This will change the type of the currently active cell.

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.

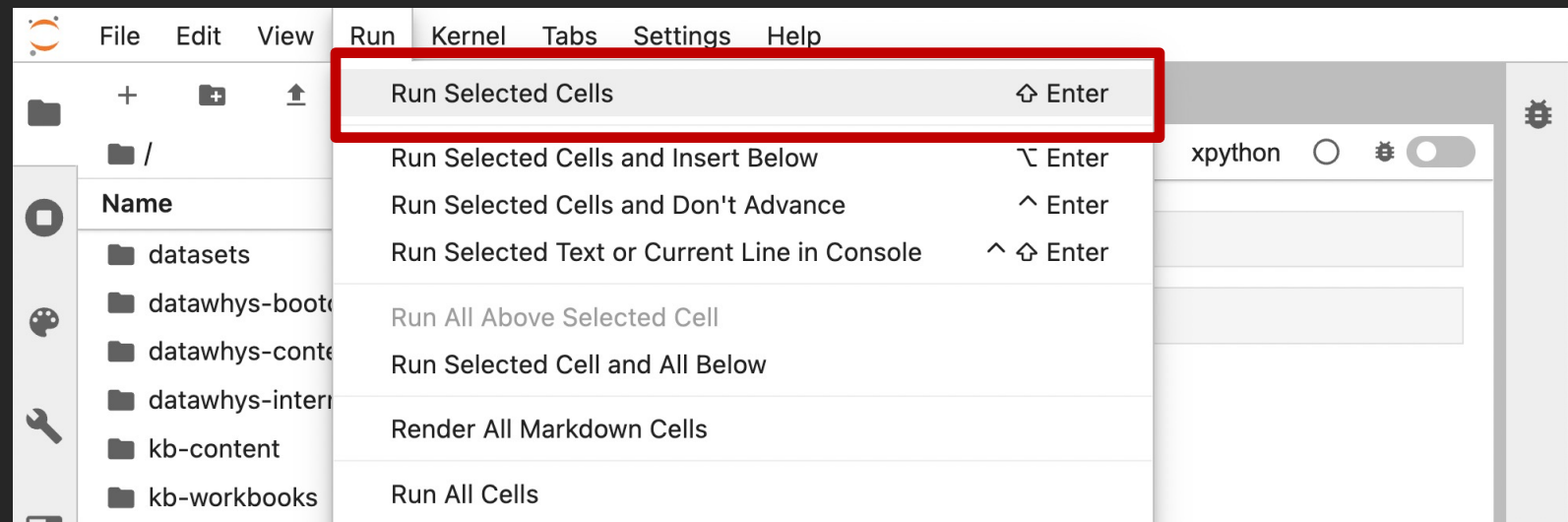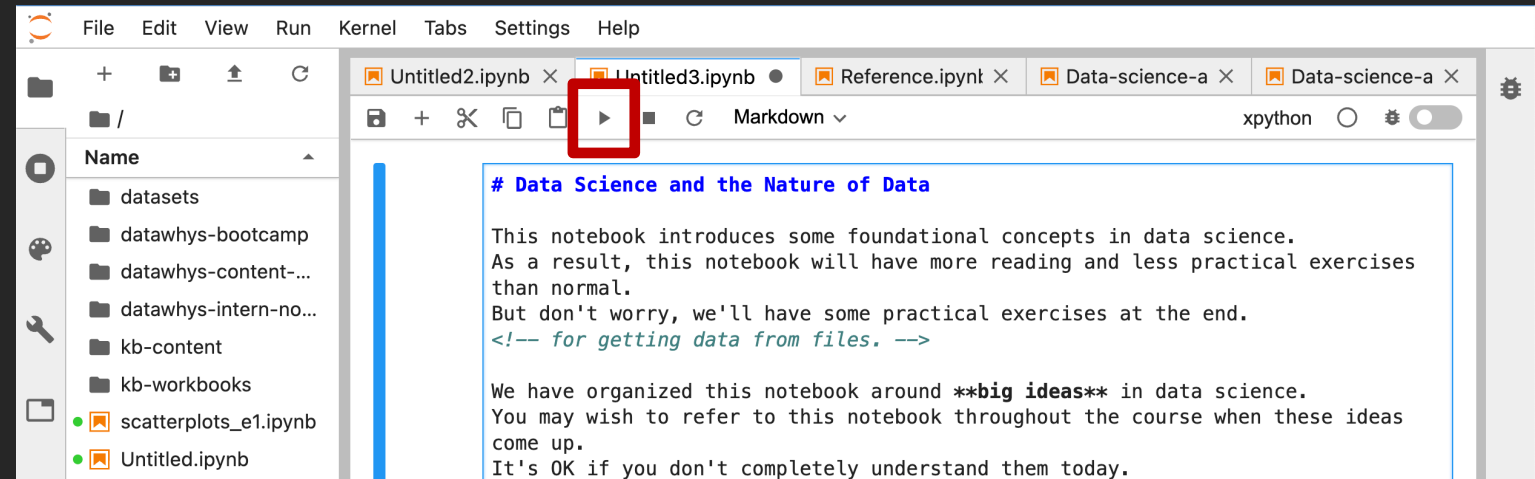# How-to: Run Currently-Active Cell

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. Take a screenshot of both cells (including output) and upload to Discord

Summary

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