

# Week 4: Reading and Writing Data

## Unit 1: Motivation and Definition

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# Motivation and definition

## How can data be permanently stored?

- Right now, all the data processed in our programs is lost when the program is stopped.
- How can data be permanently stored, even when the computer is switched off?
- Read data from and write data into **files**
- Definition of a file:
  - Logically related
  - Usually sequentially ordered
  - Permanently stored (e.g. on a hard drive)
  - Identified by a name



Hard disk

# Motivation and definition

## Showtime

Now it's time to get hands on and start programming!

If you like, you can open the [Jupyter Notebook](#) instructions in parallel to the demo.

If you haven't done so yet:

- [Download the Notebook](#)
- [Start the Jupyter Server](#) and open the Notebook

The screenshot shows a Jupyter Notebook interface with the following details:

- Title Bar:** File, Edit, View, Run, Kernel, Tabs, Settings, Help. The tab "Showtime.ipynb" is selected.
- Toolbar:** Includes icons for file operations (New, Open, Save, etc.), kernel selection (Python 3 (ipykernel)), and cell types (Code, Markdown, etc.).
- Section Header:** A section titled "Showtime" with two small decorative icons.
- Text Content:** "It's time to get hands-on and start programming!" followed by a note about keeping the notebook open for reference if not done yet, and a numbered list of steps: 1. Download the Notebook, 2. Start the Jupyter Lab Server, 3. Open the Notebook. Below this is the text "Now, let's begin! 🚀".
- Code Cell:** [1]:  
```python  
for i in range(3, 0, -1):  
 print("...", i)  
print("Showtime 🎉")  
... 3  
... 2  
... 1  
Showtime 🎉  
```
- Bottom Status Bar:** Shows "Simple" mode, "Python 3 (ipykernel) | Idle", "5" (cell count), "Mode: Command", "Ln 1, Col 15", "Showtime.ipynb", and a bell icon.

# Motivation and definition

## Summary / key takeaways

In this unit you learned ...

- ... that files are the classical means to store data

