

Getting started

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demolab is a lab notebook for computational science. You write the science as code, an experiment runs it and emits data, a write-up reads that data, and one build turns the whole repository into a website and a set of PDFs. Numbers and figures come from the run, never retyped, so a result on the page can't quietly drift from the code that produced it. A coding agent operates it in plain language; you stay in the loop.

Install

Open a coding agent in an empty folder and paste:

Clone github.com/eoinmurray/demolab and follow its `GETTING-STARTED.md` strictly.

It runs the `GETTING-STARTED` runbook and sets everything up with you: the toolchain — `uv` for Python, `Typst` for publishing, and `go-task` as the command runner — then your own copy of the repository, the scaffold, and your first experiment. You drive everything through `task`, which wraps `uv` and `typst`; you never call `pip` or `python` directly.

Your first run

The agent drives this: `GETTING-STARTED` stands the lab up, then builds your first experiment with you — your own science, or a suggested starter — and you watch it land on a live page. By hand, the loop is:

```
task install      # resolve dependencies
task scaffold    # lay down writings/ experiments/ tools/ artifacts/
task dev         # serve the site at localhost:3000, live-reloading on save
task run -- exp000 # run an experiment end to end (once you've written one)
```

Change a parameter, `task run` again, and watch the page update — figures and numbers, no prose touched. That's the whole point. `task build` compiles everything once; `task test` runs the suite. (Want a worked example in your tree? `task add-demo-content` overlays the same demo this site is built from; `task clear-demo-content` removes it.)

How a lab is laid out

Four content directories, each with one job:

- `tools/`: the **science**. Reusable models and solvers, one directory per tool. A tool emits **data** (a `numbers.json` plus the data behind each figure), never plots, and stays language-agnostic.
- `experiments/`: the **runners**. One `expNNN.py` per experiment: it calls a tool (or computes inline), renders the figures into `artifacts/data/expNNN/`, and stages a `numbers.json` of the headline metrics.
- `writings/`: the **write-ups**. One `.typ` per entry. It reads the run, `#let run = json("/artifacts/data/expNNN/numbers.json")`, embeds the figures, and pulls every number from that file. Prose-only articles (like this one) and slide decks live here too.
- `artifacts/`: the committed **record**: `data/<id>/` (figures + numbers) and `pdfs/` (a PDF per entry, plus a bound book). The built website (`site/`) is regenerated by CI, so it's gitignored.

The engine itself lives in `demolab-engine/`: a black box you never edit, swapped wholesale when you update.

The loop

The discipline is one rule with teeth: *nothing on the page is typed by hand*.

1. A tool computes and writes data files.
2. A runner turns that data into figures and a `numbers.json`.
3. A write-up reads the `numbers.json` and embeds the figures.
4. `task build` compiles the repository into a website, a PDF per entry, and a book.

Change the code, rebuild, and the prose, figures, and numbers update together. Every result carries the git provenance of the run that made it.

Publish

One build emits three things from a single source: a **website** (HTML with real, selectable math), a **PDF per entry**, and a bound **book**. To put it online, `task deploy-setup` drops a GitHub Pages workflow; enable Pages in the repository settings and push. The site uses relative links, so it works under any path.

Driving it with an agent

demolab is meant to be run by a coding agent. You type a **name in capitals** and it acts:

- **HELP**: list everything it can do.
- A **guide** name (`RULES`, `HOUSESTYLE`, `SLIDES`, `STRUCTURE`, `GLOSSARY`, `SUPPORT`): it walks you through that reference.
- A **runbook** name (`LINT`, `DOCTOR`, `MIGRATE-STACK`, ...): it runs that procedure step by step.

The reference layers are documented right here in this collection: a page for each **guide** (always-on conventions), plus a **runbooks** index (the on-demand procedures).