# Plot AI compute trends with real data

Starter · 1–3 hours · Free · Step-by-step guide

Online version: https://ai-safety-sandbox.vercel.app/projects/plot-compute-trends/

## Summary

Download Epoch AI's free dataset of notable AI models, chart training compute over time in Python, estimate how fast it grows, and count how many models cross the EU AI Act's compute threshold.

## Why it matters

Compute trends drive forecasts, export controls and legal thresholds. Reproducing them is a good first project for a coder interested in governance.

## What you will have at the end

A notebook with one chart, a growth-rate estimate and a short note.

## Steps (tick each box as you go)

- [ ] **1. Get the data (15 min)**
  Download the notable AI models dataset from Epoch AI's data page (it is free, as a CSV). Open a Google Colab notebook and load it with pandas.

- [ ] **2. Chart compute over time (30 min)**
  Plot training compute against publication date with a log scale on the y-axis. Label a few famous models so the chart tells a story.

- [ ] **3. Estimate the growth rate (30 min)**
  Fit a straight line to log10(compute) for models since 2010 and convert the slope into "× per year" and a doubling time. Compare your answer with Epoch's published estimate.

- [ ] **4. Check a legal threshold (20 min)**
  The EU AI Act presumes "systemic risk" for general-purpose models trained with more than $10^{25}$ FLOP. Count how many models in the dataset exceed it, and when the first one did.

- [ ] **5. Write it up honestly (20 min)**
  Share the chart, your estimate, and the biggest caveat (for example, missing or estimated compute values for some models).

## What you need

- Basic Python (pandas and a plotting library)
- Free Google Colab
- About two hours

## What you will learn

- How compute trends are measured
- Fitting trends on a log scale
- How compute thresholds appear in law

## Key terms

**Compute**
The raw computing power (specialised chips running for a long time) used to train and run AI models. Easier to measure and track than data or ideas.

**Compute governance**
Using control over AI chips and data centres (who can buy, use or track them) as a lever for governing AI.

**EU AI Act**
The European Union's AI law. It sorts AI uses into risk levels, bans a few, and puts extra duties on high-risk uses and on general-purpose AI models.

## Source and links

Epoch AI — data on notable models and compute
https://epoch.ai/data

EU AI Act — high-level summary (general-purpose AI rules)
https://artificialintelligenceact.eu/high-level-summary/

Google Colab
https://colab.research.google.com/

## When you have finished

Write a few paragraphs on what you did, what you found and what you would try next, and share it with a friend, your society or online.

**Try next: Estimate how much compute a famous model needed**
https://ai-safety-sandbox.vercel.app/projects/fermi-estimate-training-compute/

**Try next: Are consumer GPUs a problem for export controls?**
https://ai-safety-sandbox.vercel.app/projects/consumer-gpus-and-export-controls/

Courses, mentors, small grants and communities:
https://ai-safety-sandbox.vercel.app/next-steps/

Questions? Ask in AI Safety Cardiff University (AISCU): https://aiscu.org/

## Notes