Introduction to Google Colab & PyTorch

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Oct 4th 2023

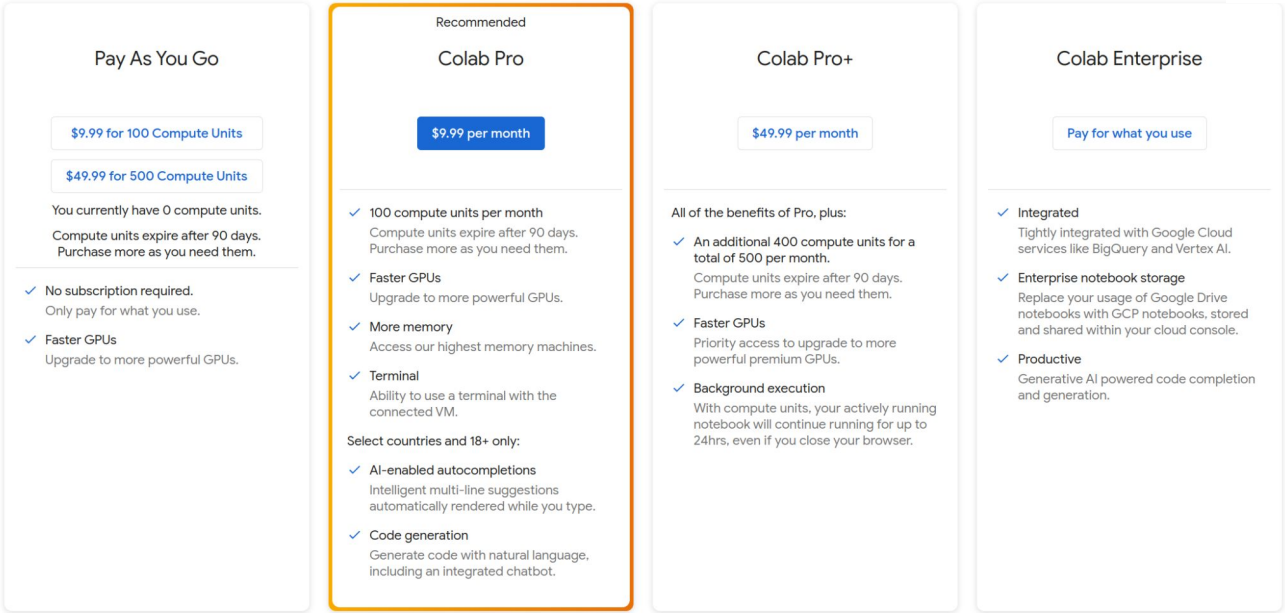
University of Minnesota
Driven to Discover℠

Outline

- **Google Colab**
- Basics of PyTorch

Google Colab

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



Pay As You Go

$9.99 for 100 Compute Units

$49.99 for 500 Compute Units

You currently have 0 compute units.

Compute units expire after 90 days. Purchase more as you need them.

- ✓ No subscription required.
  Only pay for what you use.
- ✓ Faster GPUs
  Upgrade to more powerful GPUs.

Recommended

Colab Pro

$9.99 per month

- ✓ 100 compute units per month
  Compute units expire after 90 days. Purchase more as you need them.
- ✓ Faster GPUs
  Upgrade to more powerful GPUs.
- ✓ More memory
  Access our highest memory machines.
- ✓ Terminal
  Ability to use a terminal with the connected VM.

Select countries and 18+ only:

- ✓ AI-enabled autocompletions
  Intelligent multi-line suggestions automatically rendered while you type.
- ✓ Code generation
  Generate code with natural language, including an integrated chatbot.

Colab Pro+

$49.99 per month

All of the benefits of Pro, plus:

- ✓ An additional 400 compute units for a total of 500 per month.
  Compute units expire after 90 days. Purchase more as you need them.
- ✓ Faster GPUs
  Priority access to upgrade to more powerful premium GPUs.
- ✓ Background execution
  With compute units, your actively running notebook will continue running for up to 24hrs, even if you close your browser.

Colab Enterprise

Pay for what you use

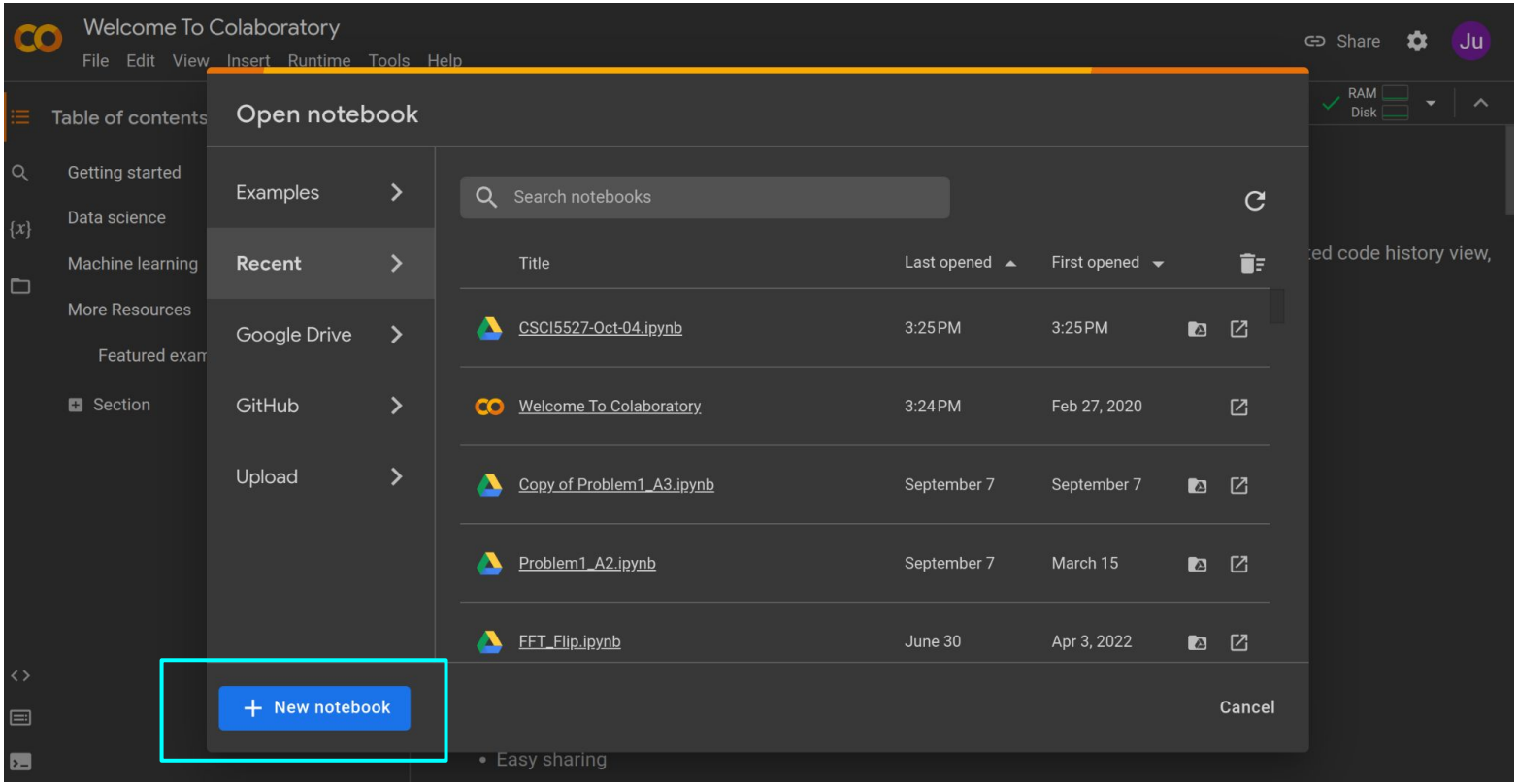
- ✓ Integrated
  Tightly integrated with Google Cloud services like BigQuery and Vertex AI.
- ✓ Enterprise notebook storage
  Replace your usage of Google Drive notebooks with GCP notebooks, stored and shared within your cloud console.
- ✓ Productive
  Generative AI powered code completion and generation.

https://colab.research.google.com/signup

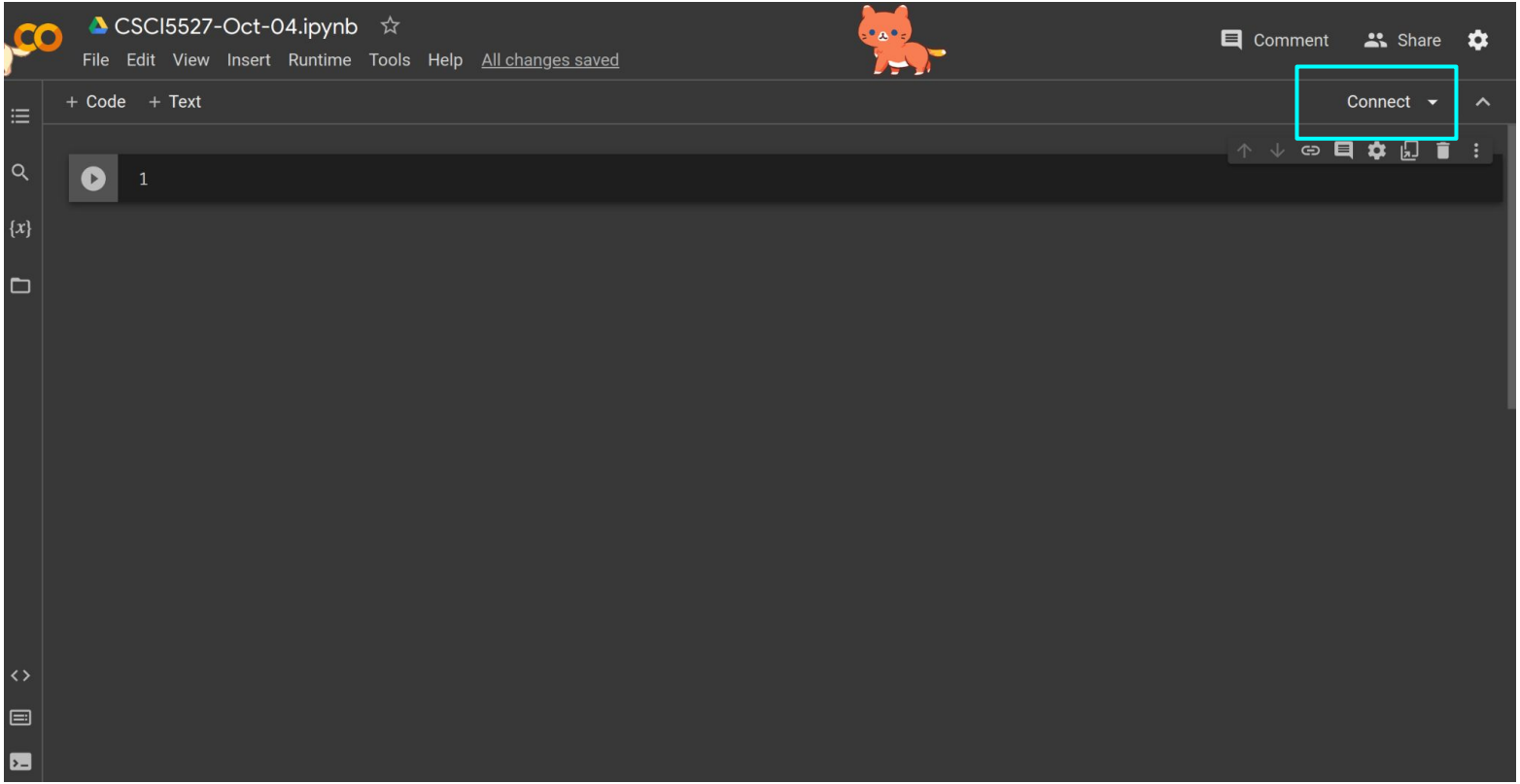
Everyone registered to the class receives **3-month subscription to Colab Pro**, reimbursed by the CS&E department directly into your student account

Create a new notebook

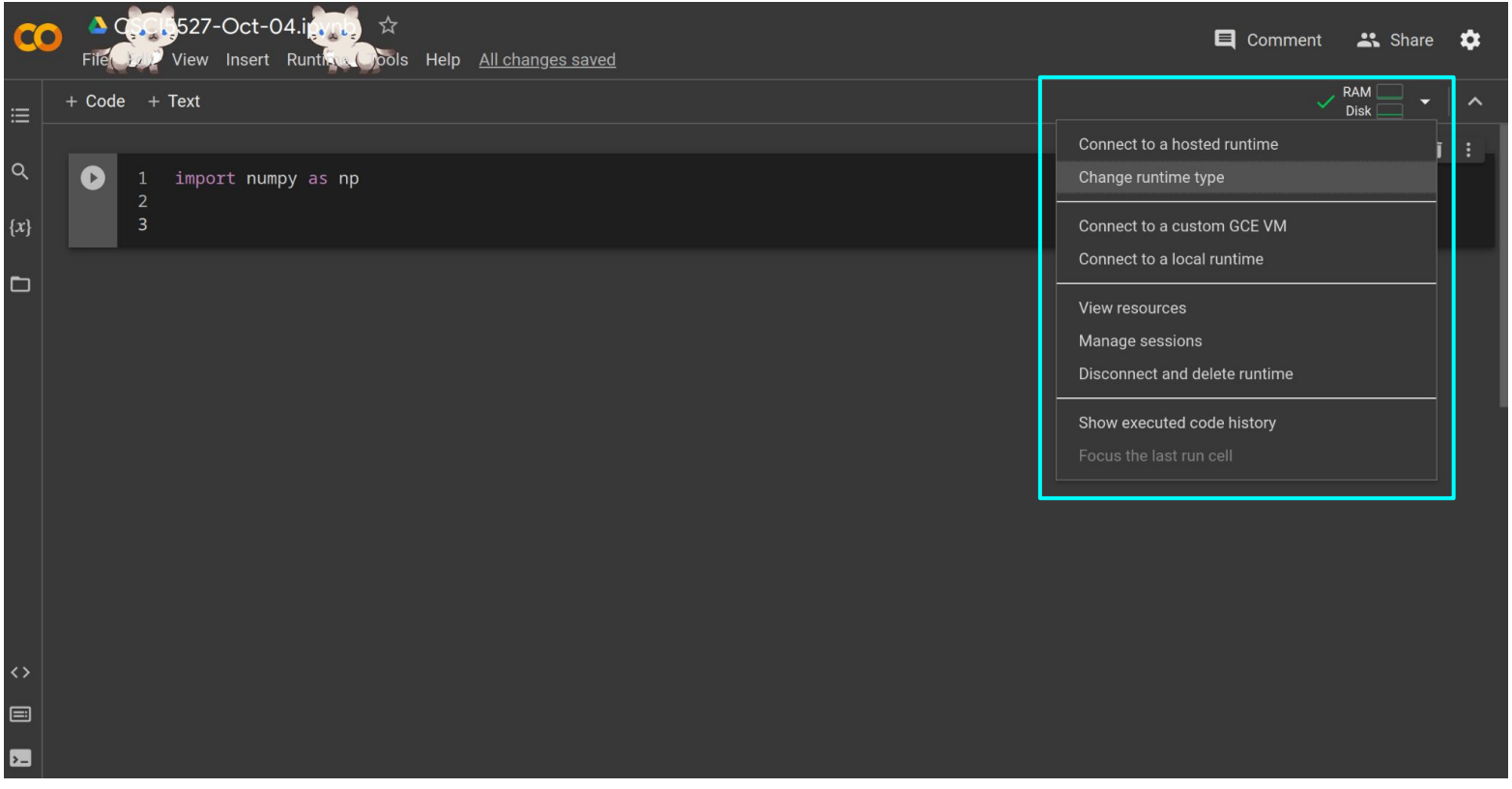
https://colab.research.google.com/



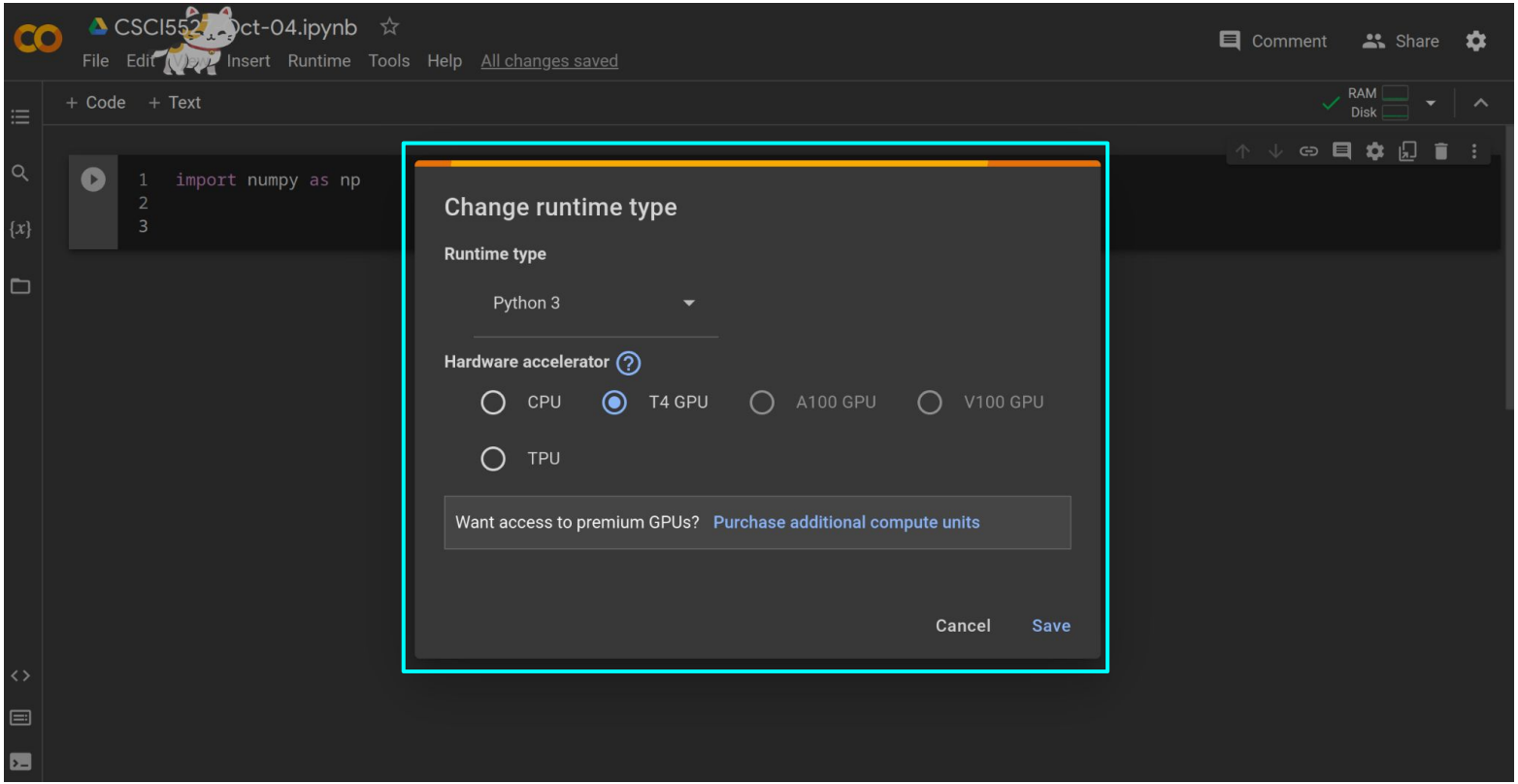
Connect to a runtime session



Change runtime type

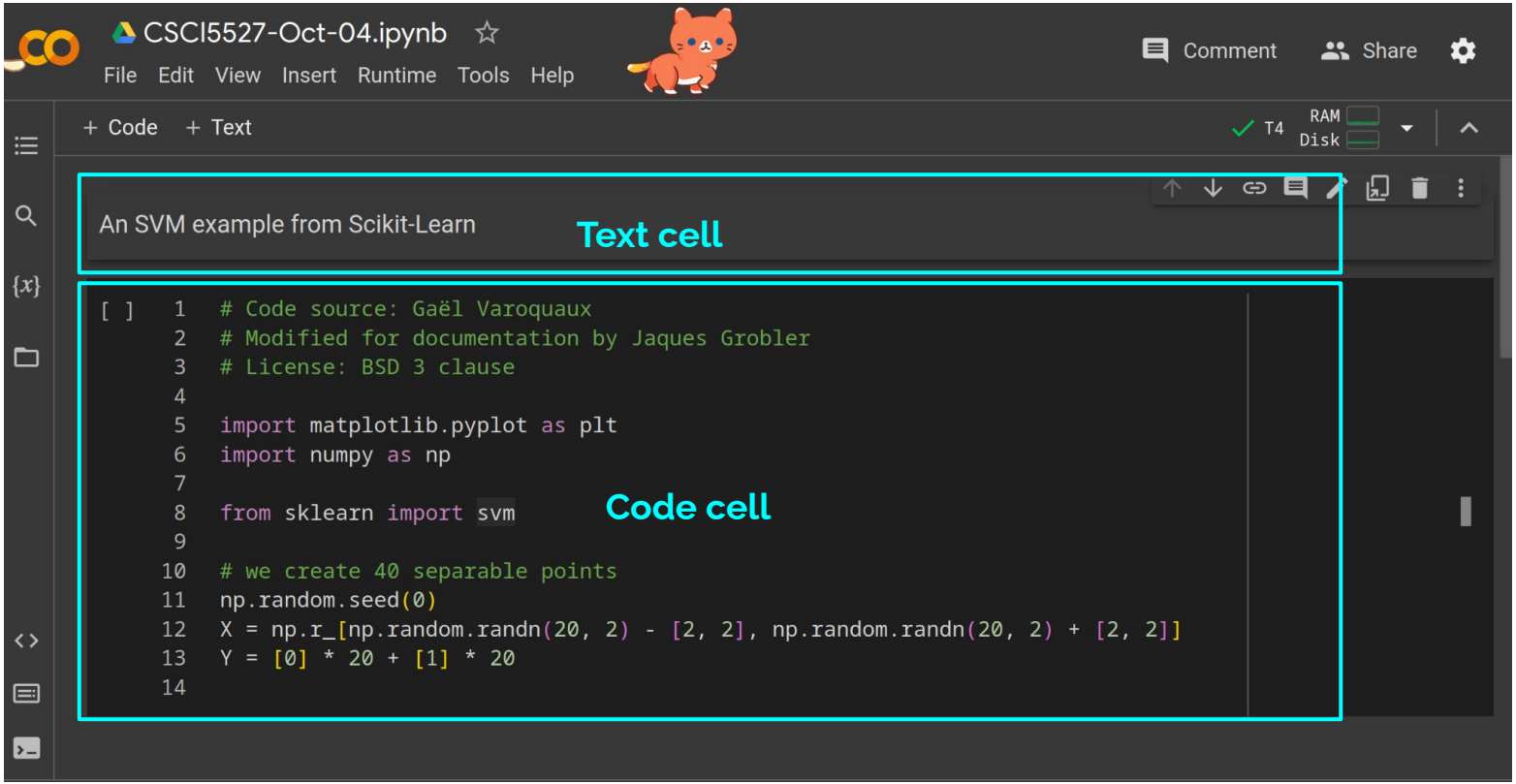


Choose GPU's to speed up

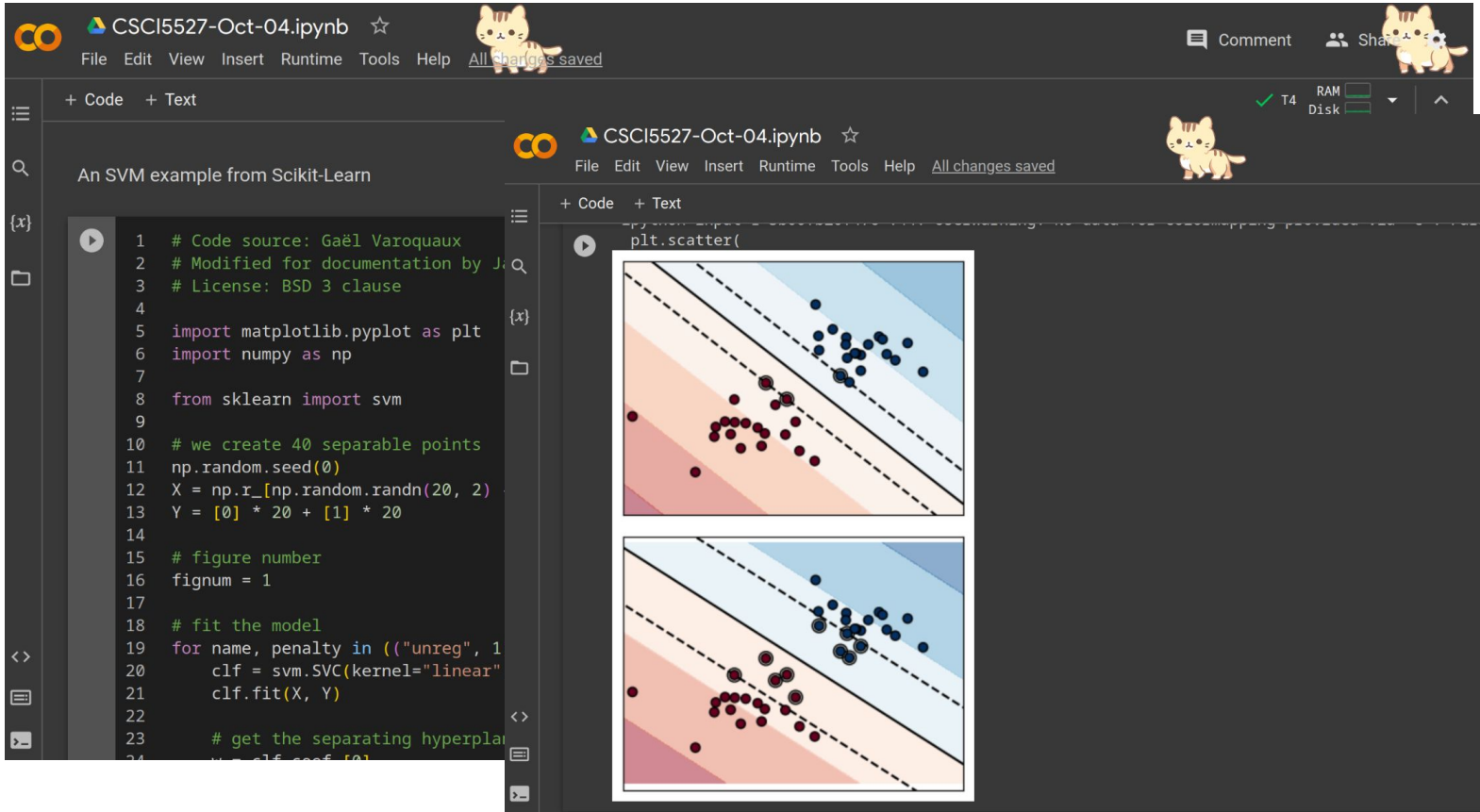


Text cells and code cells

Text cells use Markdown syntax
https://colab.research.google.com/notebooks/markdown_guide.ipynb

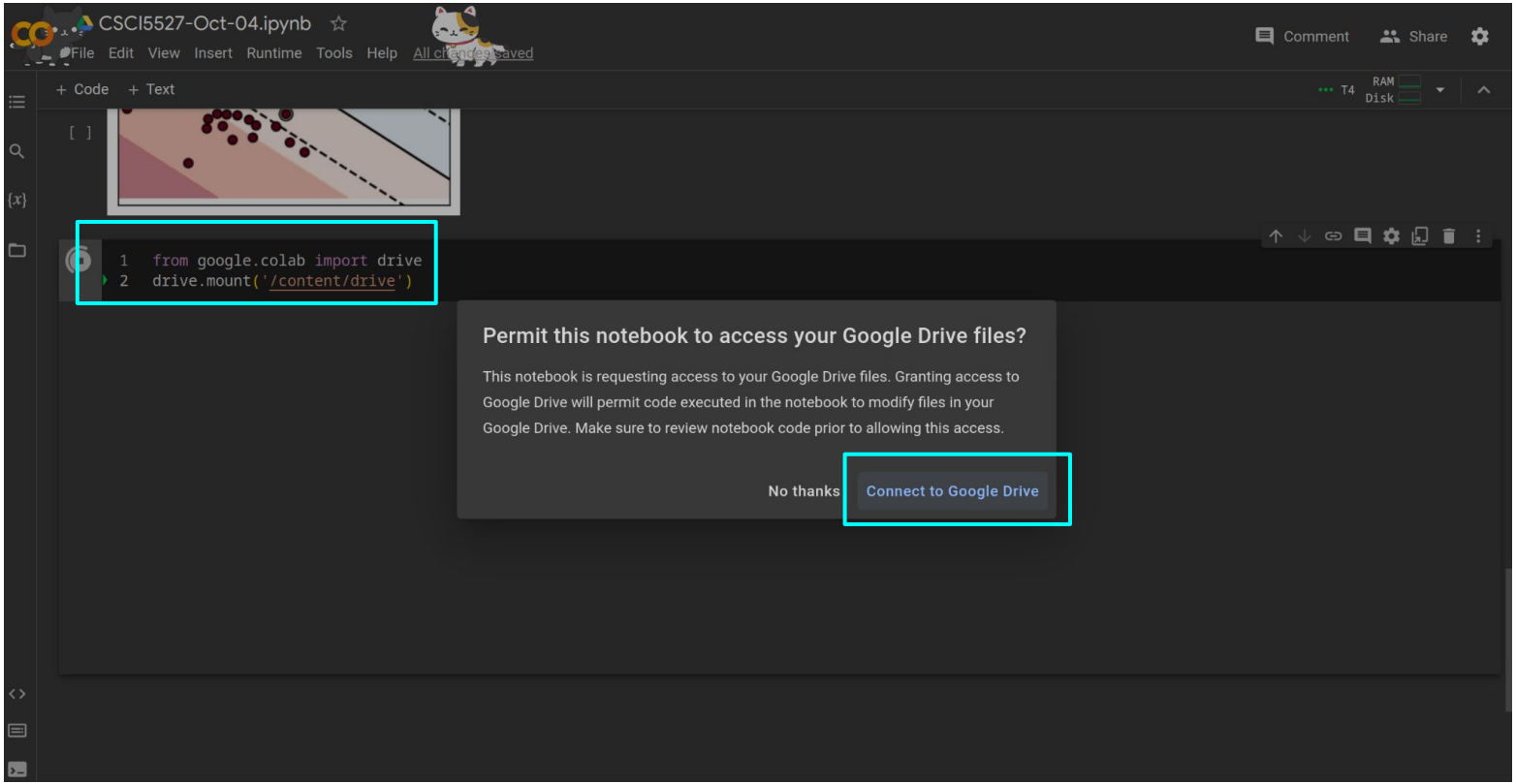


Click and run

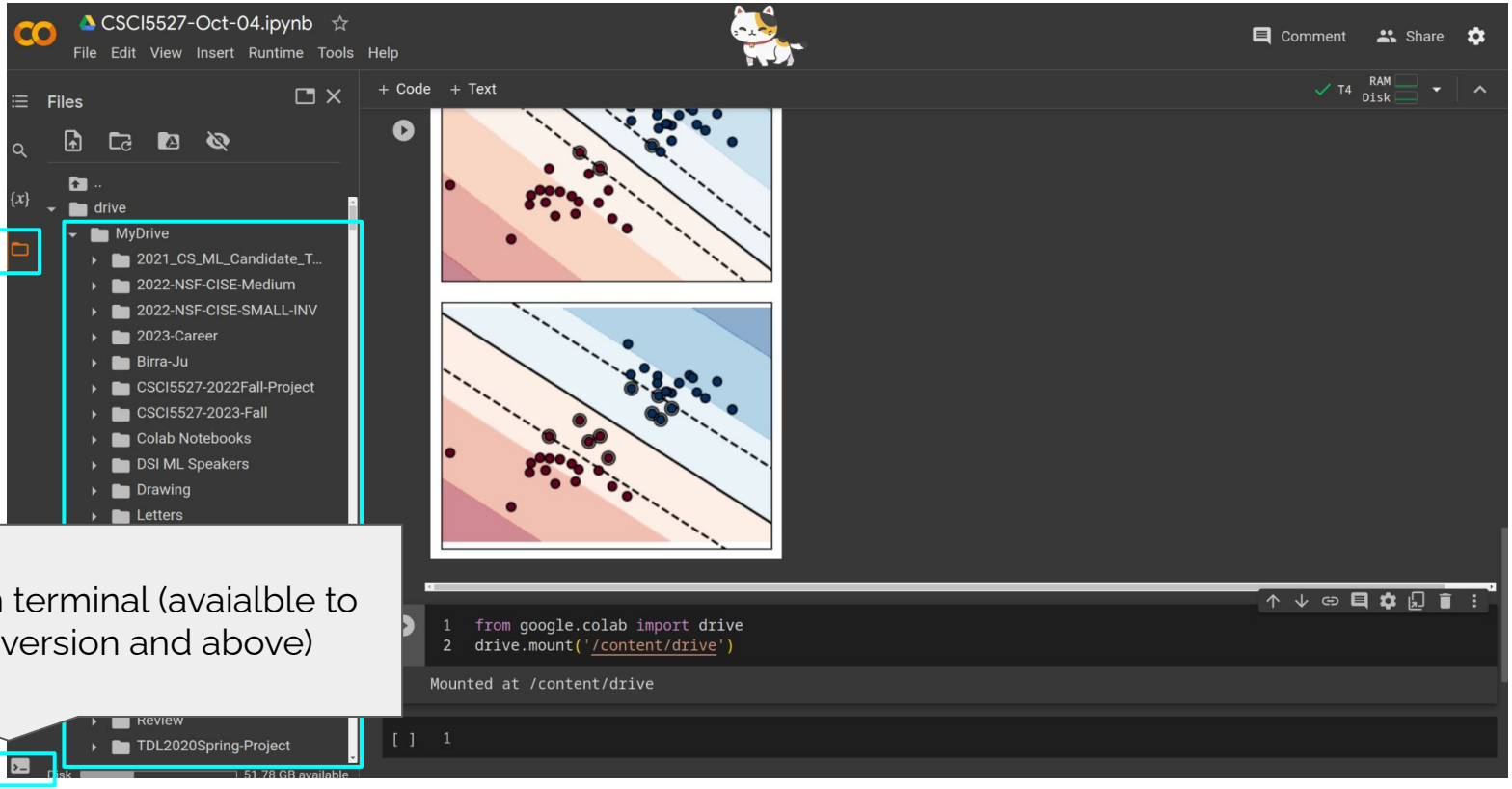


External data

https://colab.research.google.com/notebooks/io.ipynb

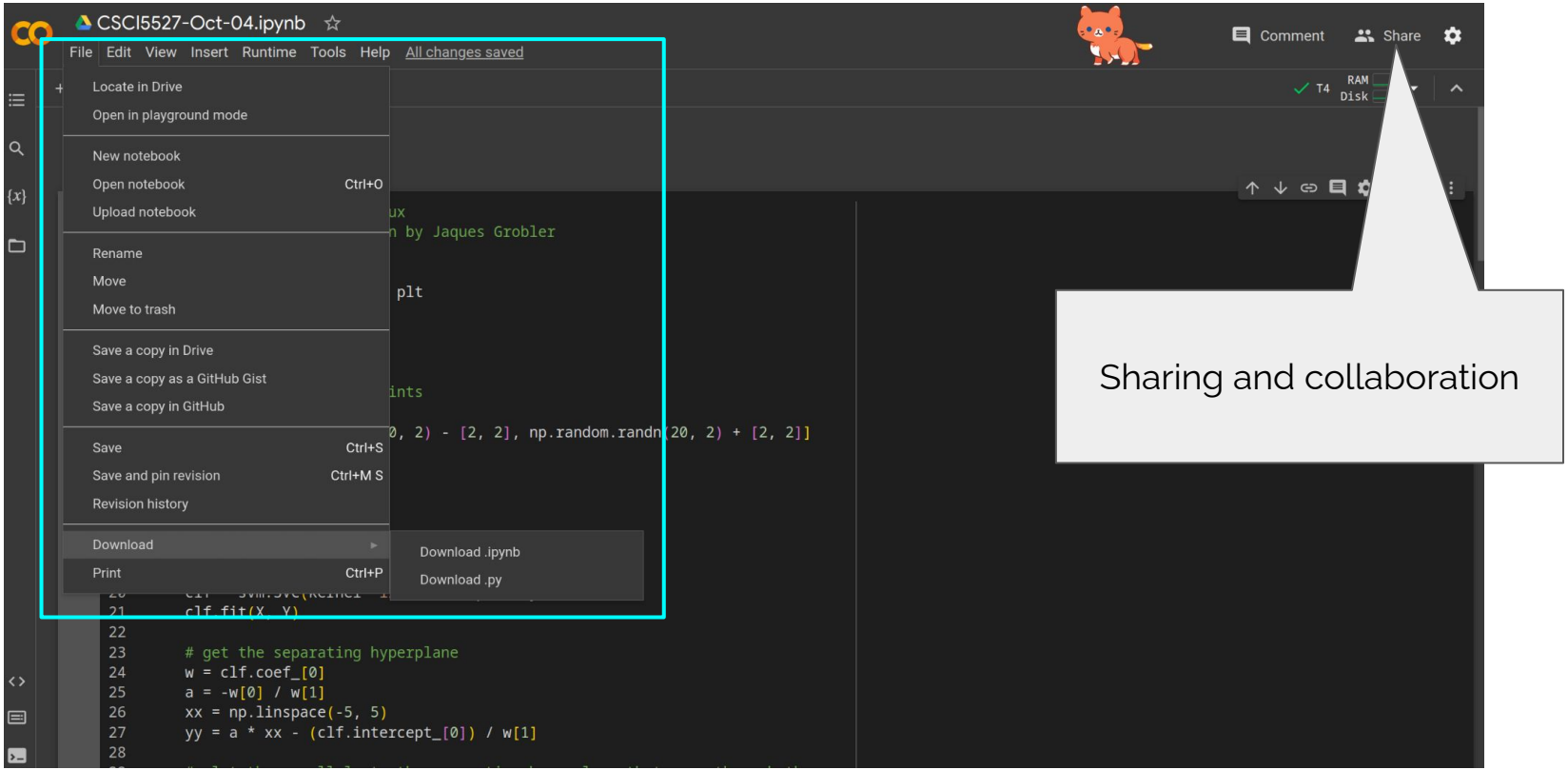


Google drive accessible from the session

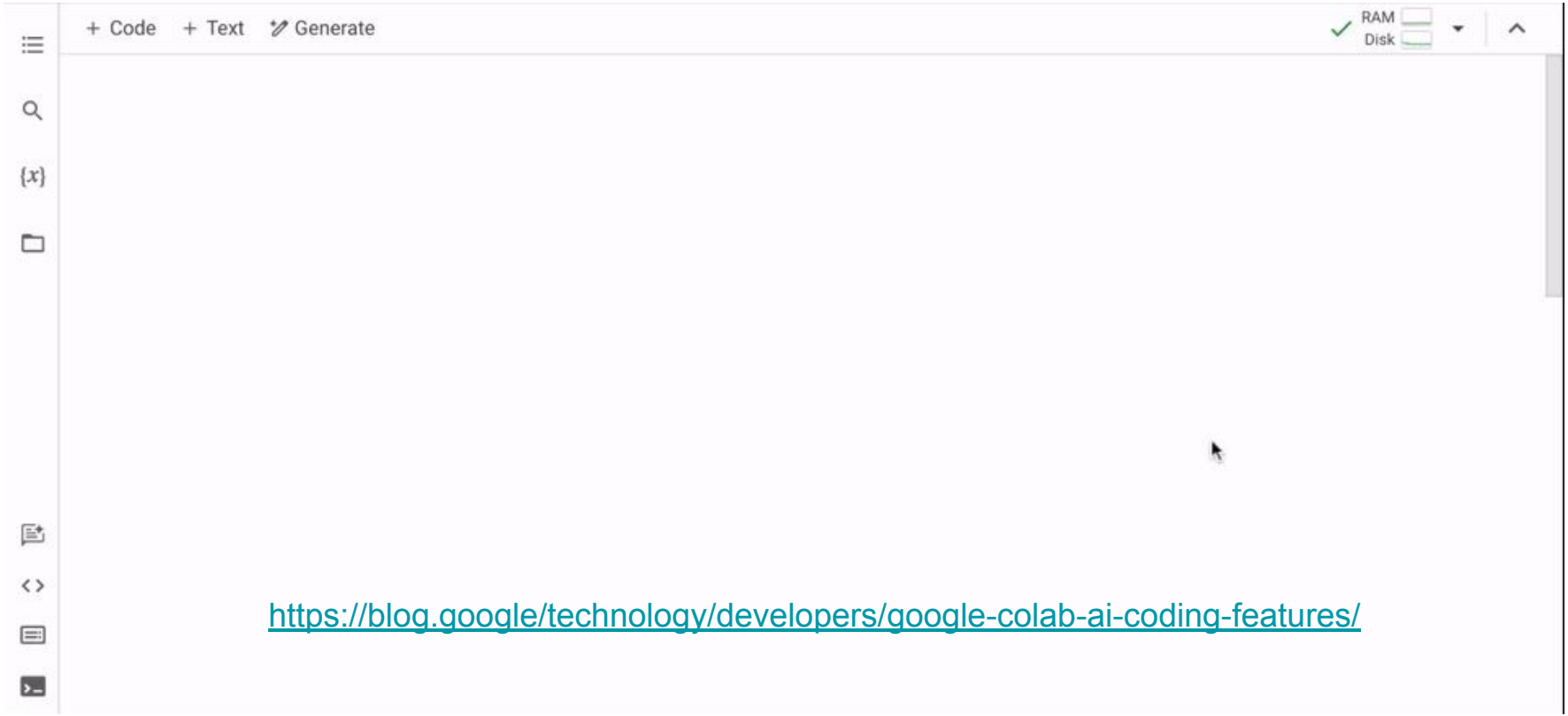


Built in terminal (avaialble to Pro version and above)

Download the notebook



Codey — AI-powered code generation



https://blog.google/technology/developers/google-colab-ai-coding-features/

More resources about Colab

https://colab.research.google.com/notebooks/intro.ipynb

Outline

- Google Colab
- **Basics of PyTorch**

A deep learning software framework

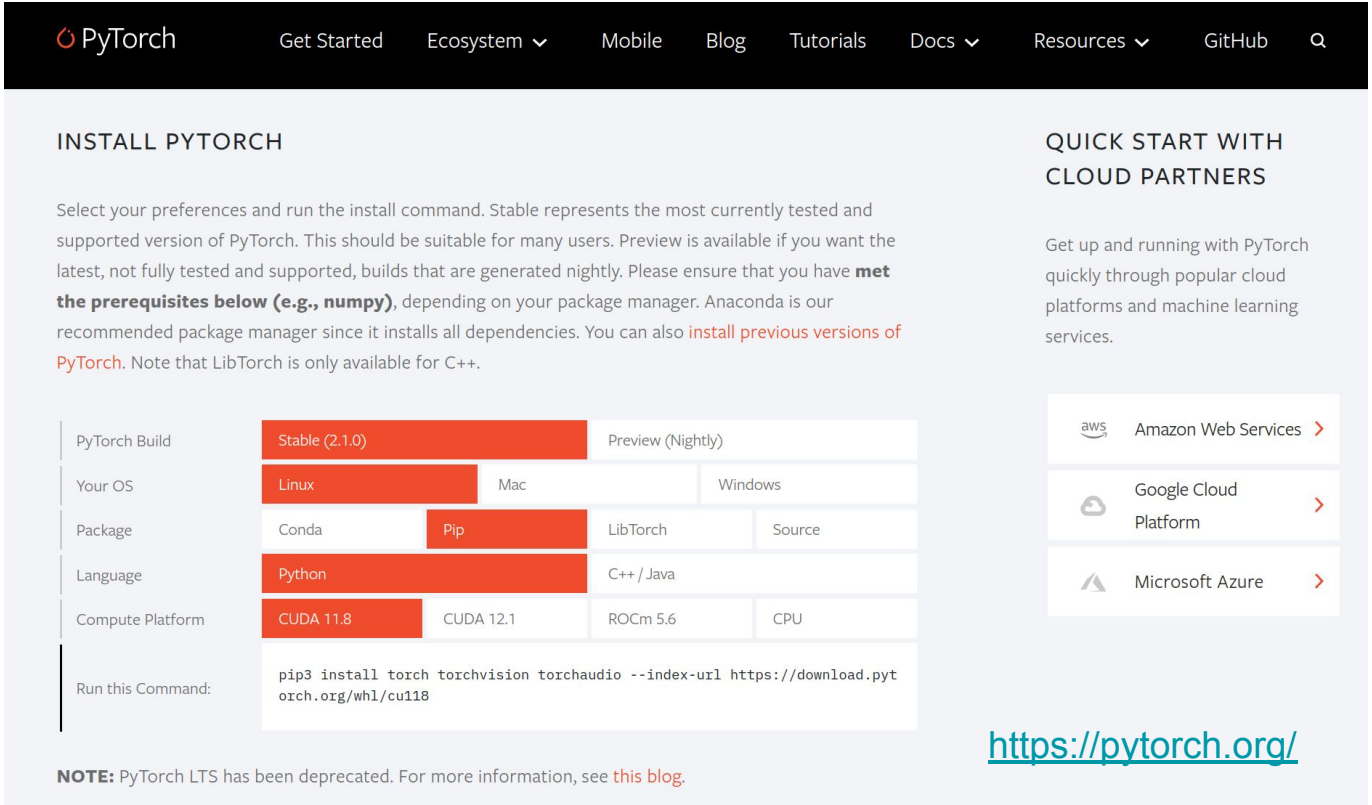
Basic components

- Tensors — basic data objects
- Autograd — auto-differentiation
- Optimizer — optimization algorithms
- Both CPU & GPU support

Specialized components

- Neural network modules (torch.nn)
- Domain-specific modules (torchvision, torchtext, torchaudio, etc)

Cross-platform, cross-language, cross hardware



https://pytorch.org/

Learning PyTorch with examples

https://pytorch.org/tutorials/beginner/pytorch_with_examples.html

https://pytorch.org/tutorials/beginner/basics/intro.html