

Theory and Practice of Deep Learning

Practice Session 1- Introduction to PyTorch

Instructor: Prof. Berrak Sisman

TA: Zongyang DU

zongyang_du@mymail.sutd.edu.sg

Practice Session 1- Introduction to PyTorch

- **Date & Time**

- CI01: Week 2 Friday (Feb 4) 11:30 am
- CI02: Week 3 Wednesday (Feb 9) 8:30 am

- **Location is Zoom!**

- Recording will be provided for your future practice as well.
- The Zoom link will be announced on Edimension.

- **Duration:** ~90 minutes

Outline

- Introduction
- Installation / How to start?
- Practice session
 - Tensors
 - Computation graph
 - Autograd
 - How to take the derivative of a function
 - Gradient descent
 - Backpropagation (BP)
 - Dataset and Dataloader
 - Dataset Transforms

Introduction

- What is Pytorch
 - An open source machine learning library
 - Used for applications such as computer vision (CV) and natural language processing (NLP)
 - Developed by Facebook's AI Research lab (FAIR).

A number of pieces of deep learning software are built on top of PyTorch, including Tesla Autopilot, Uber's Pyro, Hugging Face's Transformers, PyTorch Lightning, and Catalyst.

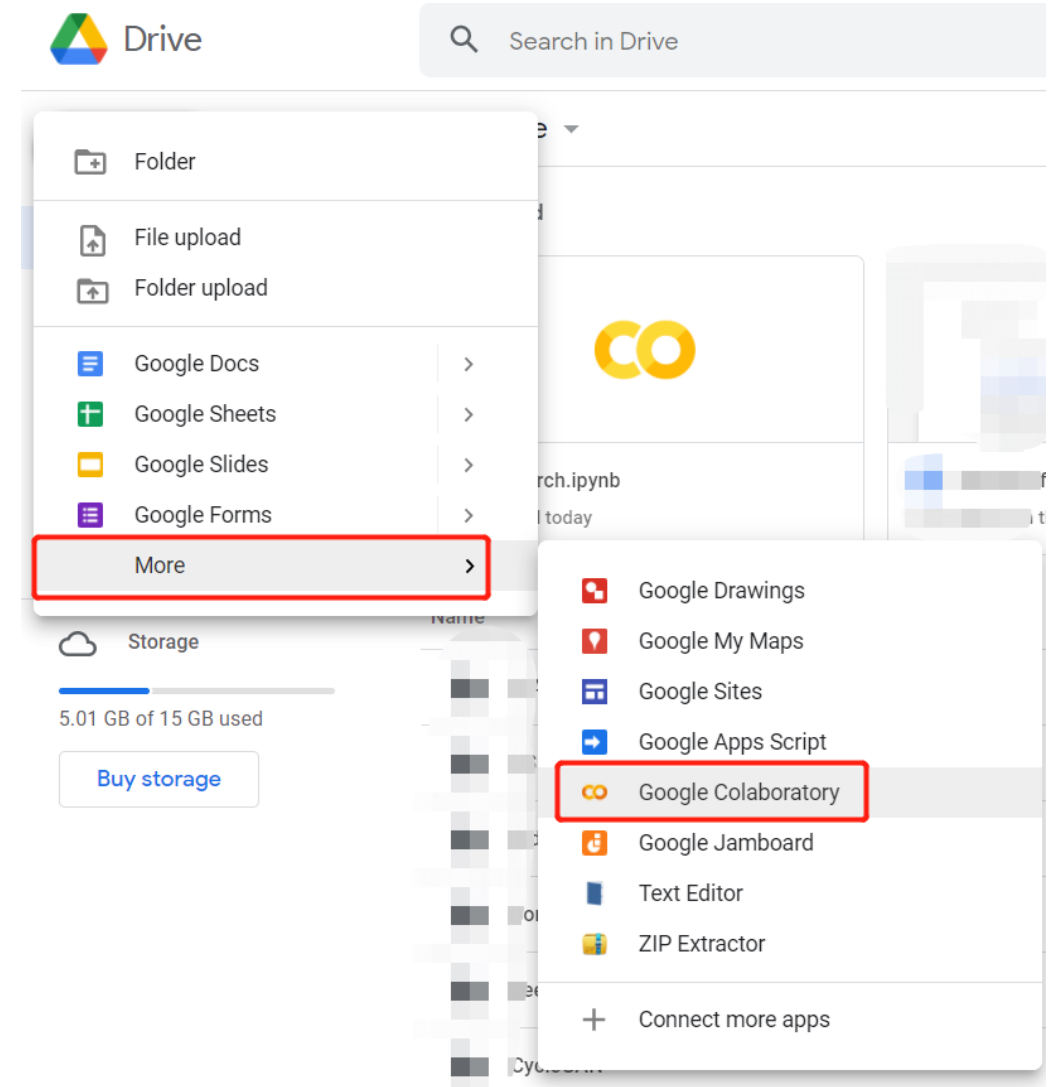
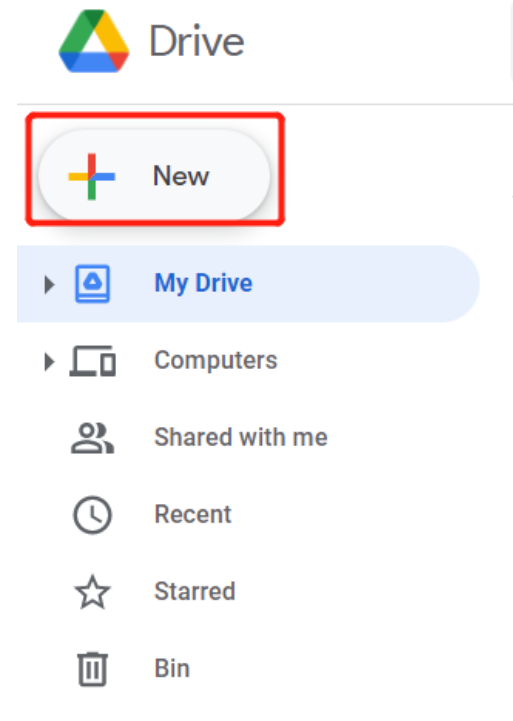
- PyTorch provides two high-level features:
 - Tensor computing (like NumPy) with strong acceleration via graphics processing units (GPU)
 - Deep neural networks built on a type-based automatic differentiation system

Let's start!



How to start?

- In the cloud
 - [In the cloud](#)
 - Google Colab



How to start?

- Google Colab
 - GPU is needed

The screenshot displays the Google Colab web interface. At the top, the notebook title 'Pytorch.ipynb' is highlighted with a red box. Below the title bar, the 'File' menu is open, and the 'Notebook settings' option at the bottom is highlighted with a red box. In the center, the 'Notebook settings' dialog box is shown. Within this dialog, the 'Hardware accelerator' dropdown menu is open, with 'GPU' selected and highlighted by a red box. To the right of the settings dialog, a runtime selection menu is visible, with 'Connect to a hosted runtime' highlighted by a red box. The interface also shows a left sidebar with navigation icons and a top right area with 'Comment' and user icons.

The way we use in this session

Practice Session 1- Introduction to PyTorch

The topics we will cover are listed here:

- Tensor Basics
- Auto grad
- Gradient descent
- Back propagation
- Dataset and Dataloader
- Dataset Transforms

Let's start the practice part



Session 2 (Week 4)

The topics we will cover in next session are listed here:

- Build Model
- Deep learning
- Logistic Regression example
- CNN example

It will be announced on Edimension.

Thank you! 😊

Acknowledgment

- [University of Washington CSE446](#)
- [PyTorch Official Tutorials](#)
- [PyTorch Beginner Tutorials](#)