# 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.

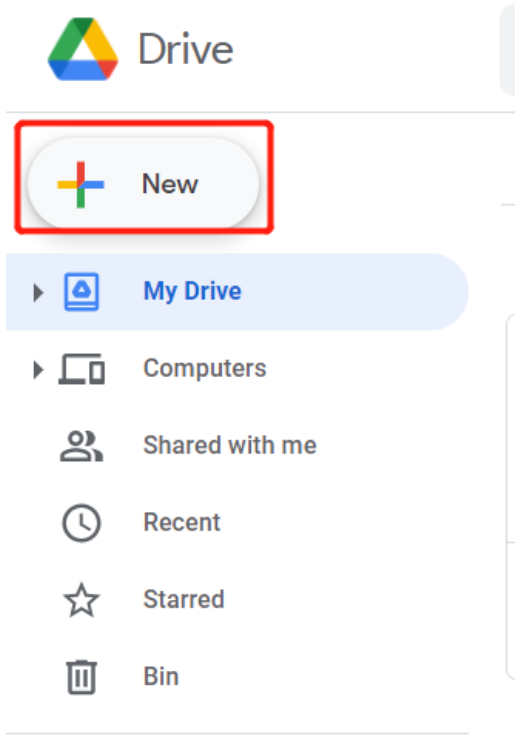
- PyTorch provides two high-level features:
  - Tensor computing (like NumPy) with strong acceleration via graphics processing units (GPU)
  - Deep neural networks built on a type-based automatic differentiation system

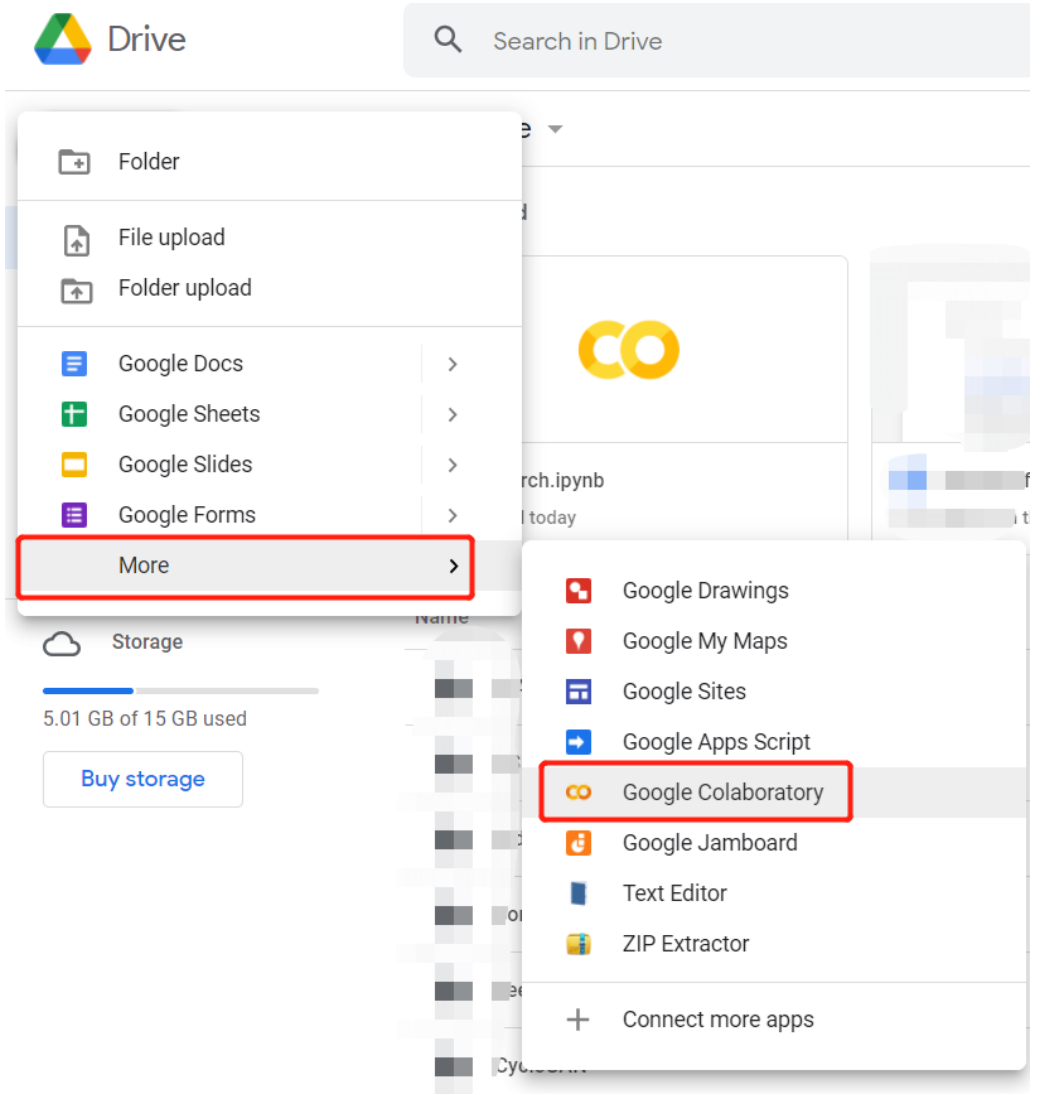
Let’s start!

https://pytorch.org/

# How to start?

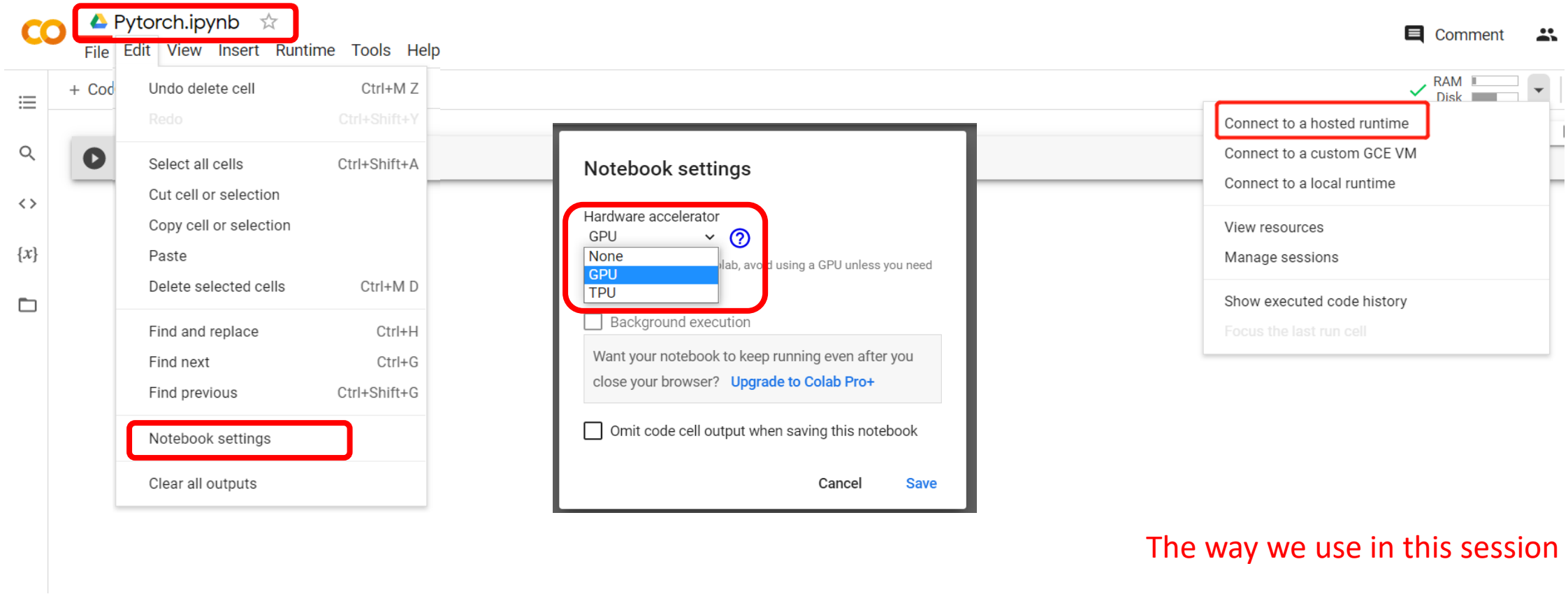
- In the cloud
  - In the cloud
  - Google Colab



# How to start?

- Google Colab
  - GPU is needed




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