Laboratory

A World of Tensors

Deep Learning for Artificial Intelligence (DLAI)

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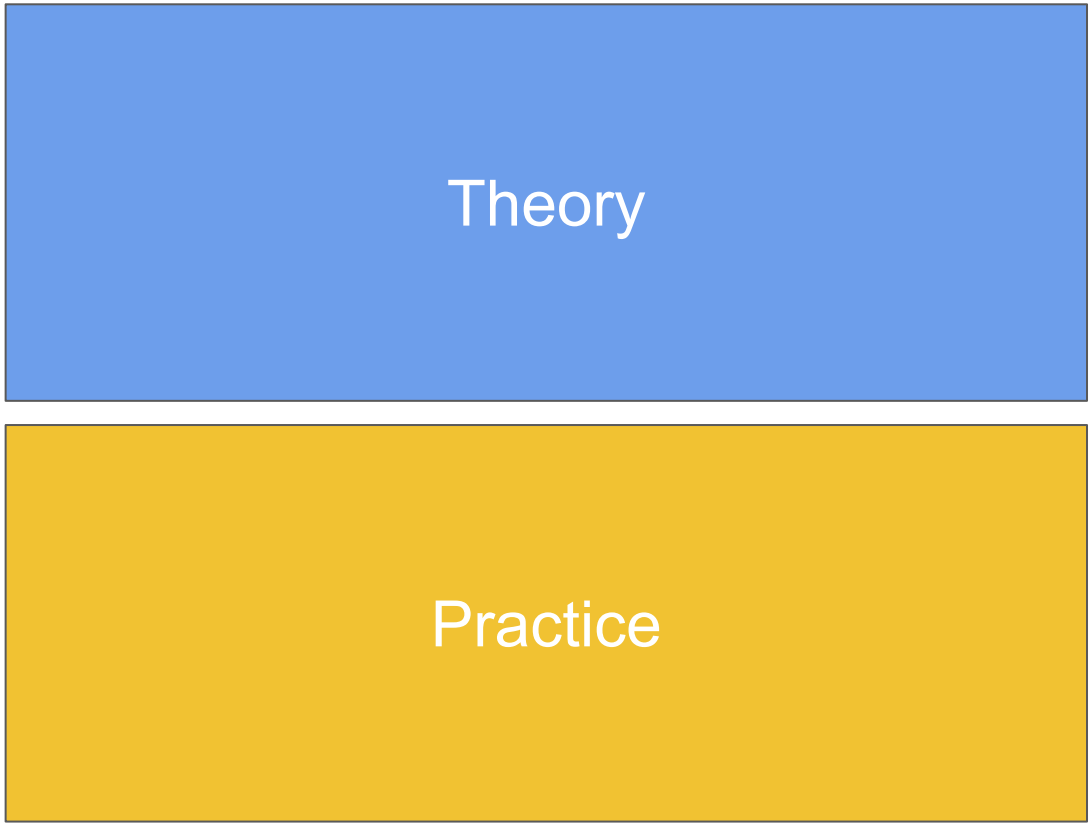
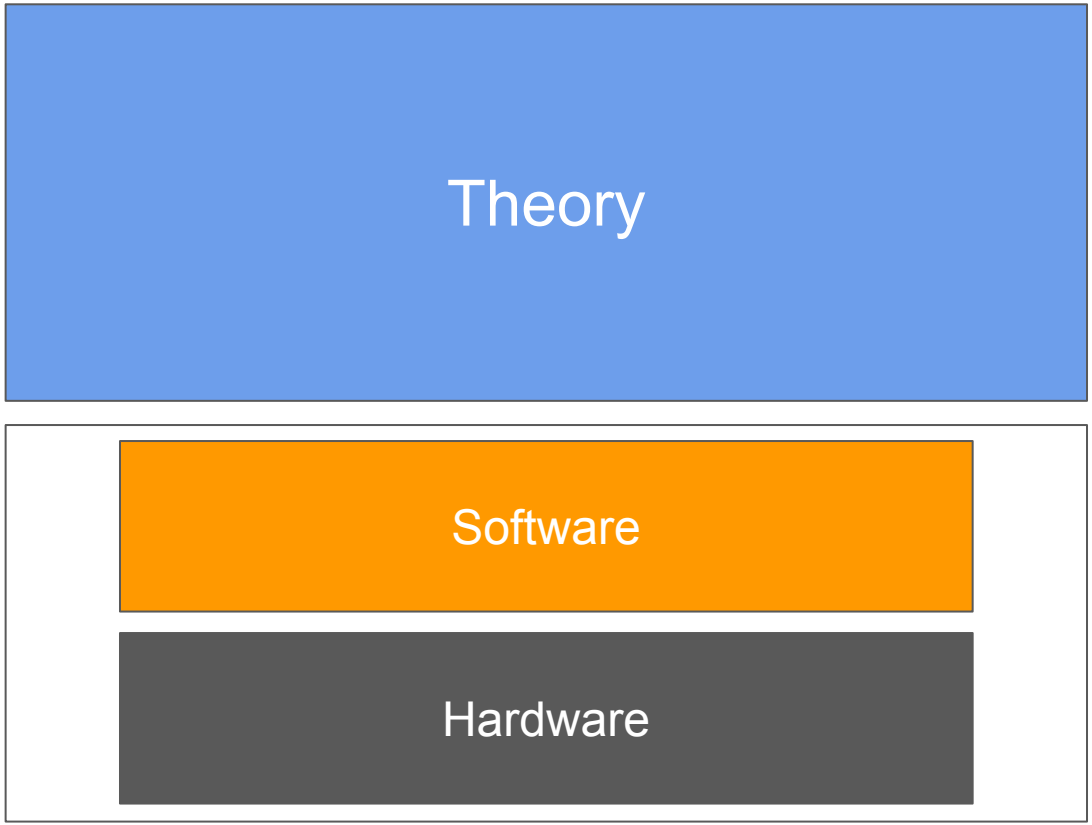
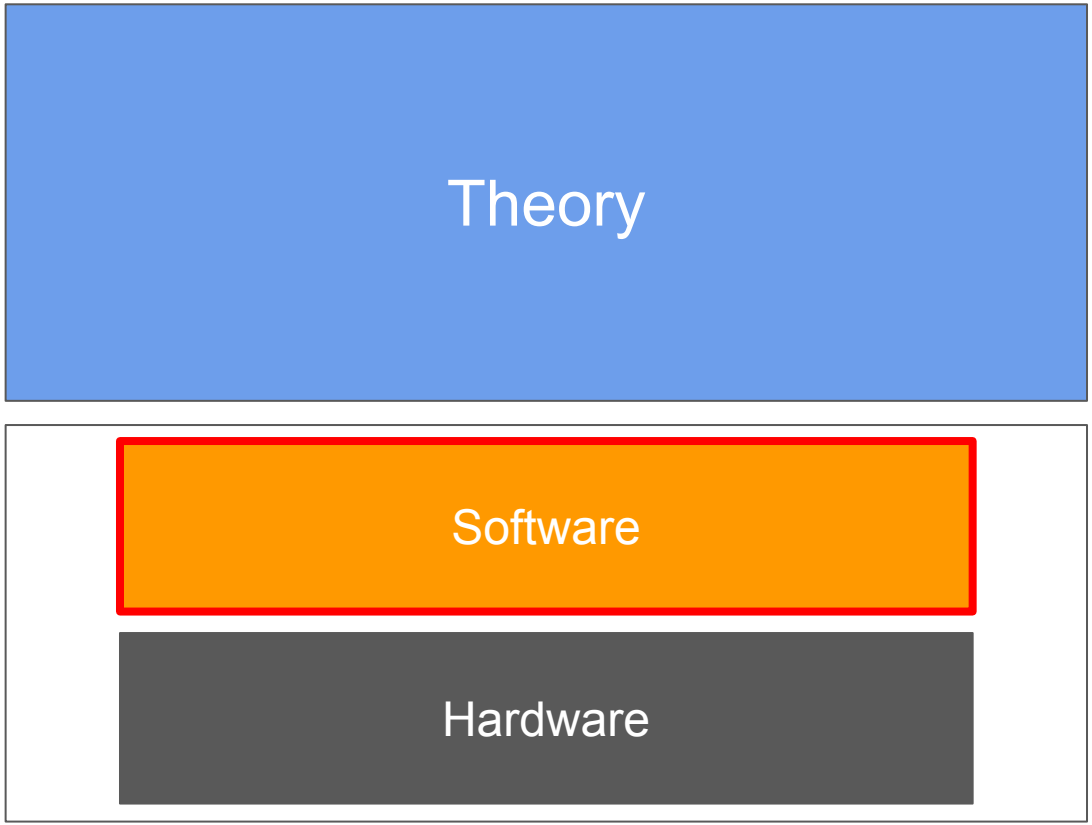
We will focus on...



We will focus on...

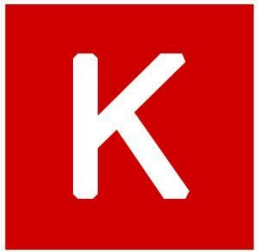


We will focus on...



Software frameworks

There are many deep learning frameworks



Software frameworks

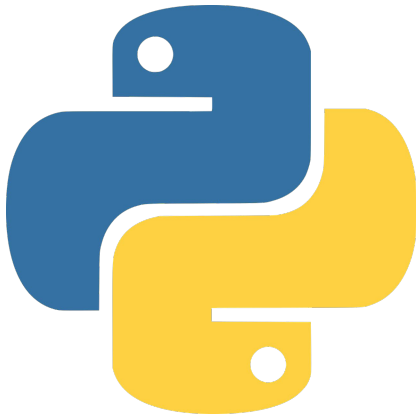
All our labs will be developed in PyTorch:

- Simple.
- Object-oriented programming.
- Widely used in research.
- Production ready too!

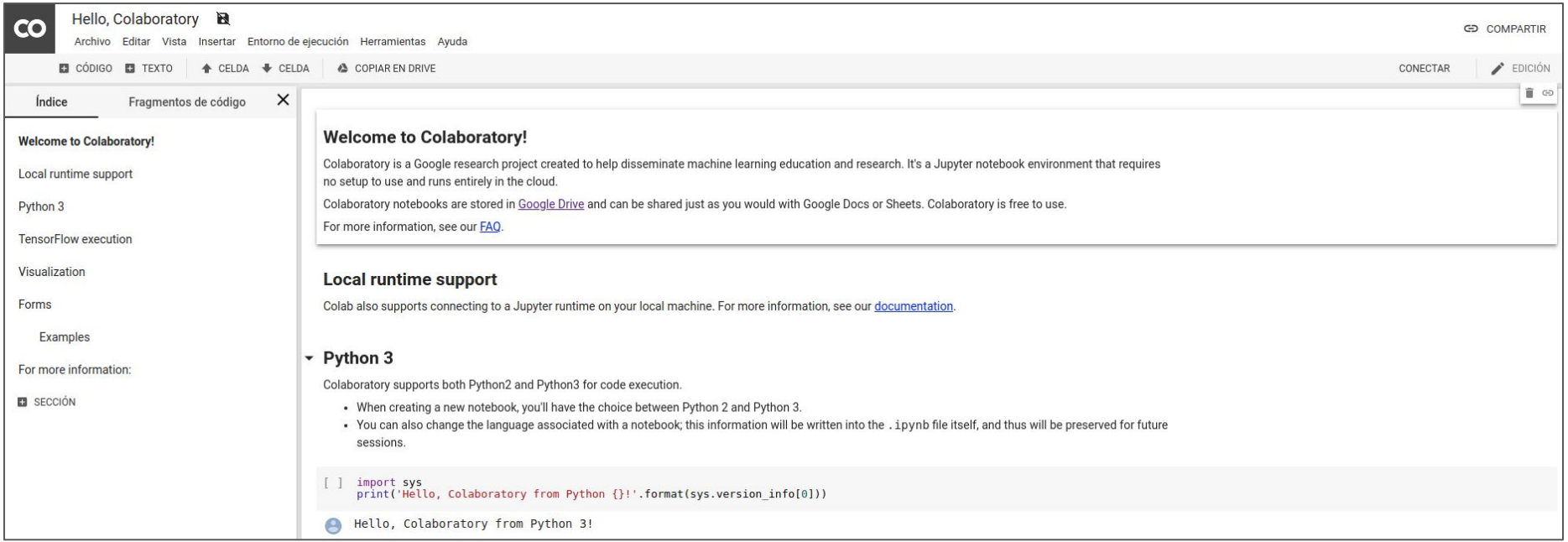
PyTorch is moving to the Linux Foundation under the name PyTorch Foundation, with a governing board of leaders from AMD, AWS, GC, Meta, Azure and NVIDIA.

Chintala, S. (n.d.). *Pytorch strengthens its governance by joining the Linux Foundation*. PyTorch. Retrieved September 13, 2022, from https://pytorch.org/blog/PyTorchfoundation/

Programming environment



Google Colab



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

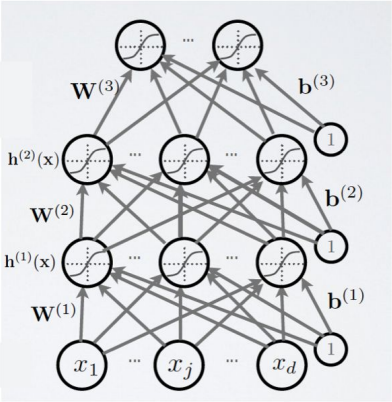
Evaluation

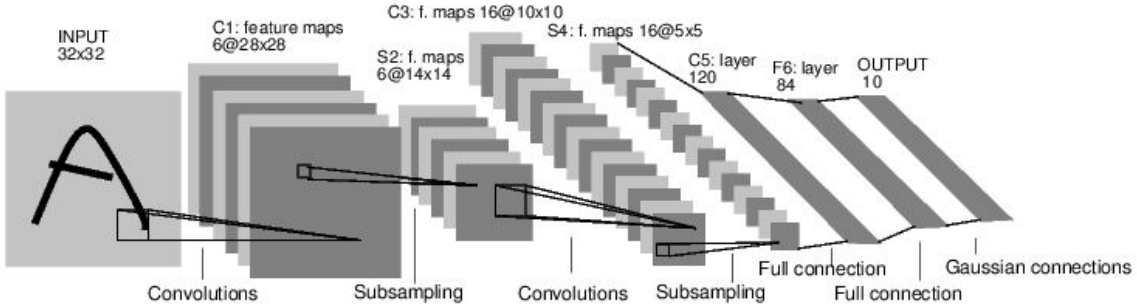
You must complete individually the online quiz for the lab in Atenea.

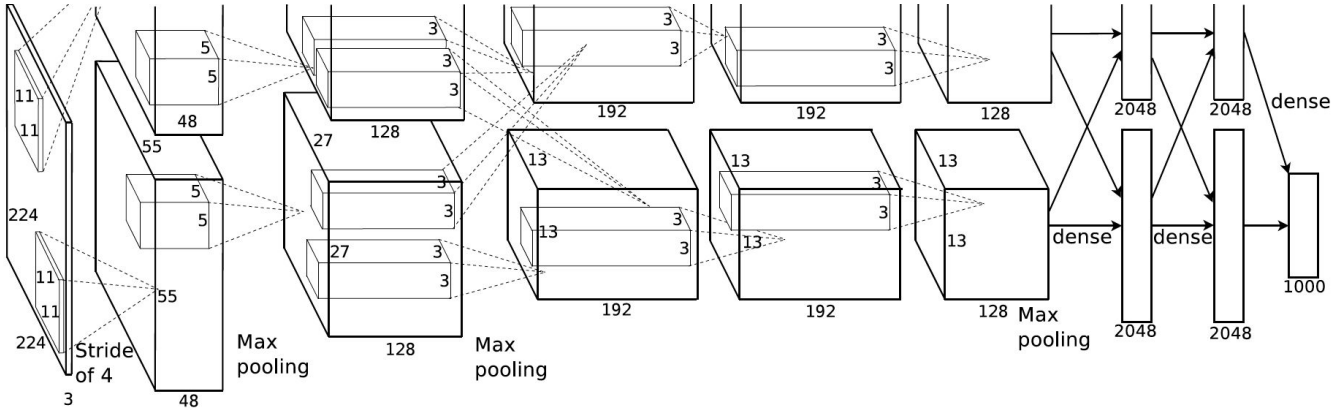
Planning

September 21	Lab01: **A World of Tensors**
September 28	Lab02: **Gradient Descent**
October 05	Lab03: **Automatic Differentiation**
October 19	Lab04: **Optimization**
October 26	Lab05: **Multi-layer Perceptron**
November 02	Lab06: **Convolutional Neural Network**
November 09	Lab07: **Overfitting**
November 16	Lab08: **Transfer Learning**
November 23	Lab09: **Interpretability**
November 30	Lab10: **GAN**
December 14	Lab11: **RNN**
December 21	Lab12: **Transformers**

First day of a DL course...







About today’s session

In this lab session, we are going to see:

1. What are tensors, concretely in the PyTorch framework.

2. How to initialize them.

3. How to operate with them, and typical operations for deep learning modeling.

Kick off the lab

1. Launch a web browser (Chrome recommended).
2. Login with your @estudiantat.upc.edu GSuite account.
3. Create a copy the notebook of this lab to your Gdrive.
4. (Right) Click on the file and choose Open File with “Google Colaboratory”