Lab 1: Pytorch setup & Introduction
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- Virtual Environments

- Conda Environments

- Setting up the Environment

- Pytorch

- Walkthrough jupyter notebook

  - Generating Tensors

  - Tensor Operations

  - Numpy Conversions

  - Device

  - Gradient Descent with Autograd

  - A simple model in Pytorch!

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- Useful to maintain dependencies of different projects.

- Essentially just a directory!

- Two popular packaging systems - Conda & Pip.

- Pip is focused around python and neglects non-python library dependencies. Conda becomes useful when you are working with non-python dependencies.

- Conda is a directory that contains a specific collection of Conda packages that you have installed.

- Handles dependencies outside of python packages & python packages themselves.

- Not interchangeable with pip, but you can install pip packages in conda environments.

- Anaconda installs over 150 scientific packages, however Miniconda installs basic packages.

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- Install Anaconda/Miniconda environments
  - https://docs.anaconda.com/anaconda/install
  - https://docs.conda.io/en/latest/miniconda.html
- Create a conda environment with the following commands:
  - **`conda create --name dlm-2022 python=3.8.8`** (PyTorch is not compatible with the latest version of Python 3.10. For now, version3.9.7 or below would do just fine.)
  - **`conda activate dlm-2023`** (Feel free to use other names instead of dlm-2023)
  - **`pip3 install torch torchvision torchaudio`**
  - **`pip3 install notebook`**
  - **`jupyter notebook`**

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- Tensorflow works on lazy computing, pytorch is dynamic and imperative, hence eager.

- Python performance is faster in Pytorch.

- Easier to learn, more memory efficient, and lighter to work with.

- Consists of Tensors as building blocks, basically numpy on GPU.

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1. [Learn the basics of Pytorch](https://pytorch.org/tutorials/beginner/basics/intro.html)
   (https://pytorch.org/tutorials/beginner/basics/intro.html)

2. [Virtual Environments in Python](https://rcpedia.stanford.edu/topicGuides/pythonEnv.html)
   (https://rcpedia.stanford.edu/topicGuides/pythonEnv.html)

3. [Managing environments in Conda](https://conda.io/projects/conda/en/latest/user-guide/tasks/manage-environments.html)
   (https://conda.io/projects/conda/en/latest/user-guide/tasks/manage-environments.html)