Deep Learning
Software installation & Code implementation

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Softwares

- Python 
- Python libraries: NumPy, SciPy, Matplotlib, DeepXDE, etc.



- Deep learning frameworks: TensorFlow, PyTorch, etc.


Python

- Anaconda 

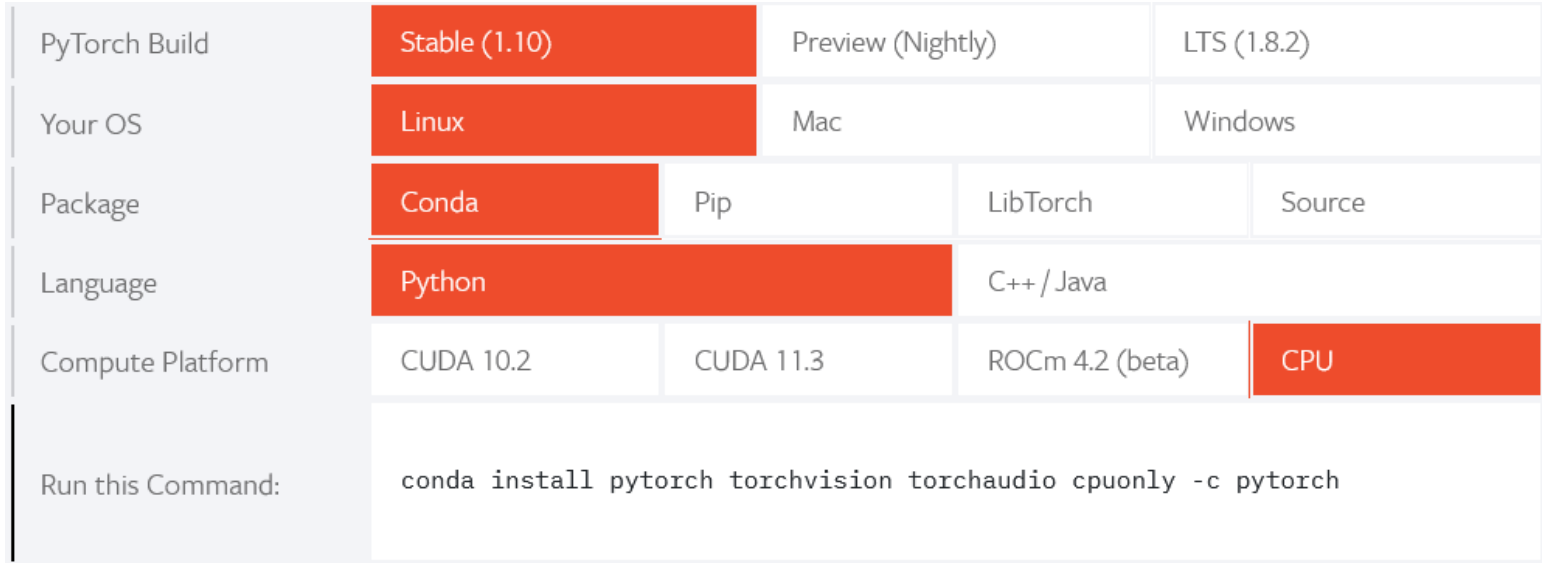
- https://www.anaconda.com

- Linux
- Windows Subsystem for Linux

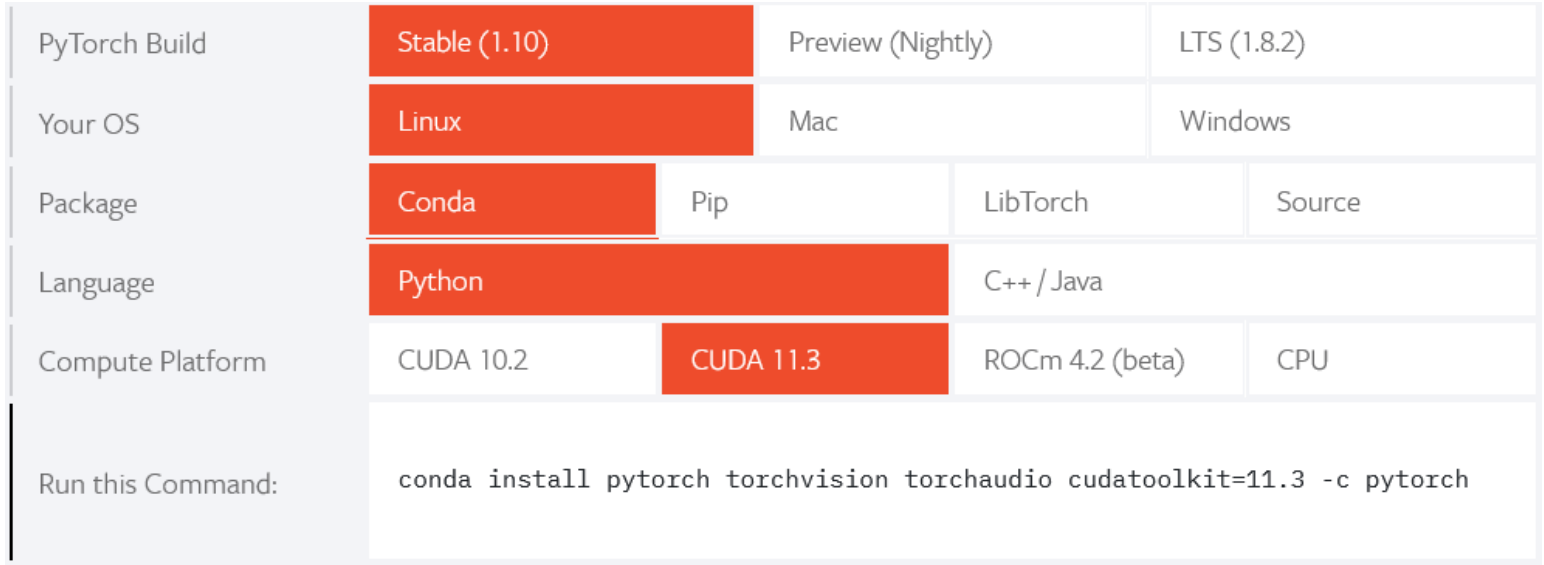
PyTorch

- https://pytorch.org

CPU



GPU



TensorFlow

- https://www.tensorflow.org

```
# Current stable release for CPU and GPU
$ pip install tensorflow
```

- GPU: compatible versions of NVIDIA driver, CUDA, cuDNN
  - Can be directly installed on OS
  - Install CUDA and cuDNN in Anaconda

Package	Version	Source
cudatoolkit	11.2.2	conda-forge
cudnn	8.1.0.77	conda-forge
TensorFlow	2.6.2	pip
tensorflow-probability	0.14.1	pip
tensorflow-addons	0.14.0	pip

Updated on 11/17/2021

DeepXDE

- https://github.com/lululxvi/deepxde
- https://deepxde.readthedocs.io

GPU

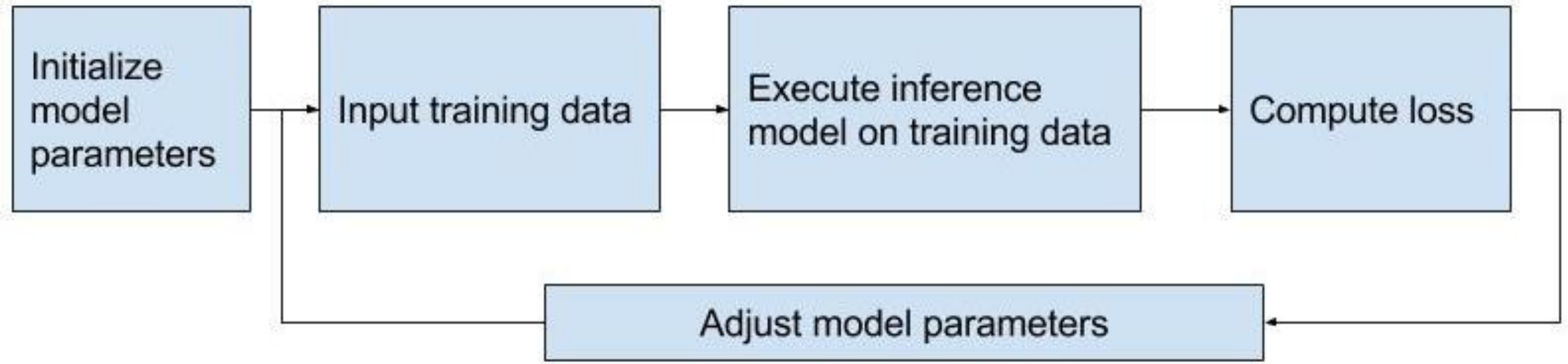
- Monitor GPU status
  - $ nvidia-smi
  - $ gpustat https://github.com/wookayin/gpustat

- Run on GPU 0
  - $ CUDA_VISIBLE_DEVICES=0 python nn.py
- Run on CPU
  - $ CUDA_VISIBLE_DEVICES=-1 python nn.py

$\Sigma\Sigma_{Job}$

- $\Sigma\Sigma_{Job}$ or $Sums_{Job}$ (**S**imple **U**tility for **M**ultiple-**S**ervers **J**ob **Sub**mission) is a simple Linux command-line utility which submits a job to one of the multiple servers each with limited resources.
- https://github.com/lululxvi/sumsjob

Training loop



Hands-on