Week 1 — PyTorch Basics & Tensors (30 minutes/day)

The first week focuses on learning PyTorch's core concepts — tensors, automatic differentiation, simple models, and data handling. By the end of this week, you will be able to implement and train a basic neural network from scratch using PyTorch.

Day 1: Install PyTorch + setup

Recommended Resources:

- Install PyTorch: https://pytorch.org/get-started/locally/
- Test GPU availability: `torch.cuda.is_available()`
- Resource: PyTorch 'Get Started' guide

Practice Questions:

- Can you import torch without errors?
- Can you check CUDA availability?

Day 2: Tensors vs NumPy

Recommended Resources:

- Create tensors with `torch.tensor`, `torch.zeros`, `torch.rand`
- Convert between NumPy arrays and tensors
- Resource: https://pytorch.org/tutorials/beginner/blitz/tensor_tutorial.html

Practice Questions:

- Create a 3x3 tensor of ones and multiply it by 5.
- Convert a NumPy array to a tensor and back.

Day 3: Autograd

Recommended Resources:

- Learn `requires_grad`, `.backward()`, `.grad`
- Resource: https://pytorch.org/tutorials/beginner/blitz/autograd_tutorial.html

Practice Questions:

- Create a tensor x with requires_grad=True and compute y = x^2. What is dy/dx?

Day 4: Simple Linear Regression

Recommended Resources:

- Build y = wx + b model with `nn.Linear`

- Manually update parameters with gradient descent
- Resource: https://pytorch.org/tutorials/beginner/basics/quickstart_tutorial.html

Practice Questions:

- Train on a simple dataset and reduce loss over time.

Day 5: Dataset & DataLoader

Recommended Resources:

- Learn `torch.utils.data.Dataset` and `DataLoader`
- Resource: https://pytorch.org/tutorials/beginner/basics/data_tutorial.html

Practice Questions:

- Create a dataset of (x, y=x^2) and load in batches of 4.

Day 6: First Feedforward Network

Recommended Resources:

- Use `nn.Sequential` to build a 2-layer net
- Train on toy data (e.g. sklearn's make_moons)
- Resource: https://pytorch.org/tutorials/beginner/blitz/neural_networks_tutorial.html

Practice Questions:

- Build a net that classifies make_moons data with >90% accuracy.

Day 7: Review + Small Project

Recommended Resources:

- Use diabetes dataset from scikit-learn
- Train regression model with PyTorch
- Evaluate with MSE
- Resource: https://scikit-learn.org/stable/datasets/toy_dataset.html

Practice Questions:

- Load diabetes dataset, split into train/test, train PyTorch regression model, report MSE.