In this exercise, the goal is to understand the basics of building a neural network and training. The exercise is divided into three stages:

Part 1. Pen and Paper: Manual Gradient Calculation (6 points): You will manually calculate the forward pass, loss computation, backward pass, and parameter updates for a simple neural network. This part will be completed in the notebook **ex1_01_pen_and_paper.ipynb**

Part 2. NumPy Implementation for Network Training (10 points): You will implement the layers used in a simple multi-layer perceptron on NumPy. This part will be completed in the notebook **ex1_02_numpy_gradient.ipynb**

Part 3: PyTorch for Regression (4 points): You will build and train a neural network in PyTorch for a toy regression problem. This part will be completed in the notebook **ex1_03_pytorch_regression.ipynb**

You will find the notebook files in the attached **Ex1_MLP.zip**

Deliverables:

Do not submit a zip file. Only submit the completed notebooks in separate files:

ex1_01_pen_and_paper.ipynb

ex1_02_numpy_gradient.ipynb

ex1_03_pytorch_regression.ipynb

Do not change the name of the notebook files as it may result in 0 points for the exercise.