**Code Example 1: simple linear regression**

**Code:** week\_5\_example\_1.py

**Code description:**

A screenshot of a computer code

AI-generated content may be incorrect.

**Code Example 2: multivariate linear regression**

**Code:** week\_5\_example\_2.py

**Code description:**

A math problem with black text

AI-generated content may be incorrect.

**Code Example 3: multivariate polynomial regression**

**Code:** week\_5\_example\_3.py

**Code description:**

Modifies the example 2 to fit the polynomial (quadratic) model

**Code Example 4: single layer neural network regression**

**Code:** week\_5\_example\_4.py

**Code description:**

**A screenshot of a computer

AI-generated content may be incorrect.**

**Code Example 5: deep neural network regression**

**Code:** week\_5\_example\_5.py

**Code description:** This example demonstrates electricity load forecasting using an MLP model in PyTorch. We use historical load data to predict future demand.

1️ Data Preparation:

* Generates synthetic load data with a sinusoidal pattern.
* Uses past 10 time steps to predict the next load value.
* Normalized data using MinMaxScaler.

2️ Neural Network Model:

* Input Layer: Takes 10 features (past values).
* Hidden Layers: Two fully connected (Linear) layers with ReLU activation.
* Output Layer: Single neuron for regression output.

3️ Training:

* Uses MSE loss for regression.
* Optimized with Adam for efficient learning.

4️ Evaluation:

* Predicts on test data.
* Plots actual vs predicted values to visualize performance.

**Code Example 6: simple automatic differentiation example in Pytorch**

**Code:** week\_5\_example\_6.py

**Code description:** self explanatory code