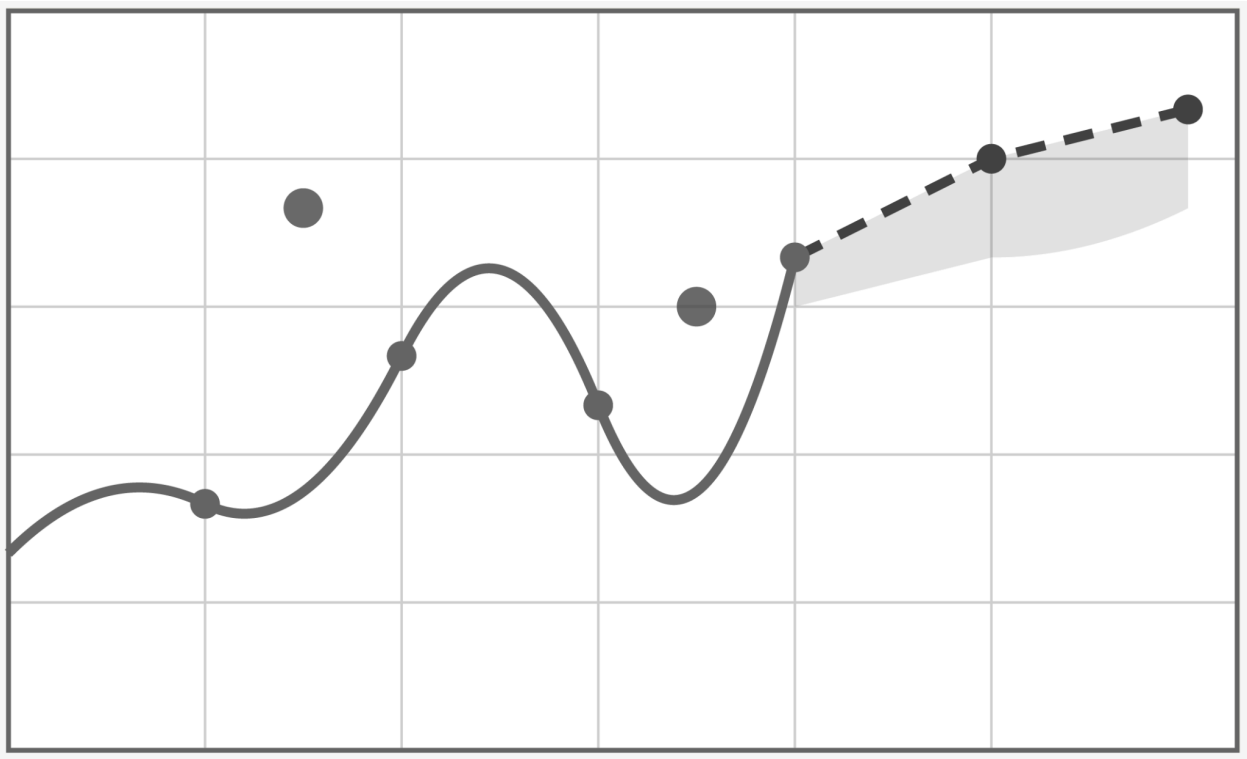
Exercises 2a
(Practical Classification)

DATA.ML.450 Time Series Analysis using Machine Learning (Autumn 2025)



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MSc in Data Science

Exercise 1

I have modified the `Exercise_train_test.py` code to improve the accuracy of the neural network classifier for time series data. In the original network, we had two hidden layers with 700 and 1000 units and a batch size of 5. To improve performance, the hidden layers were increased to 800 and 1200 units. It provided the network with more capacity to learn complex patterns. The batch size was also increased to 10 for smoother gradient updates. Then the network was trained using the Adam optimizer. The learning rate for the optimizer was 0.00125, and a cross-entropy loss for classification. The training phase ran for 400 epochs with a learning rate scheduler to reduce plateaus. After training, I tested the network on separate data, converting predictions to class labels. I calculated the accuracy, and it showed an improvement of over 1%. Finally, I generated a confusion matrix to analyze prediction performance across classes. Although these adjustments were minimal, they were sufficient to achieve measurable accuracy gains, I would say.