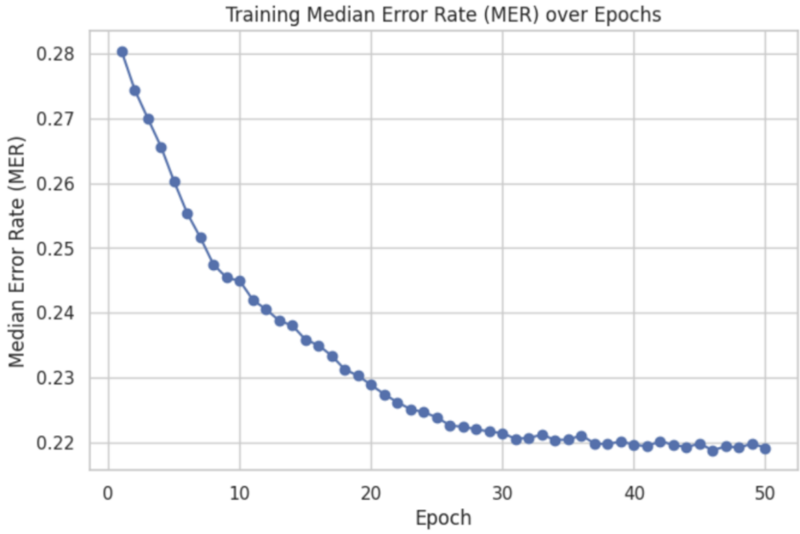
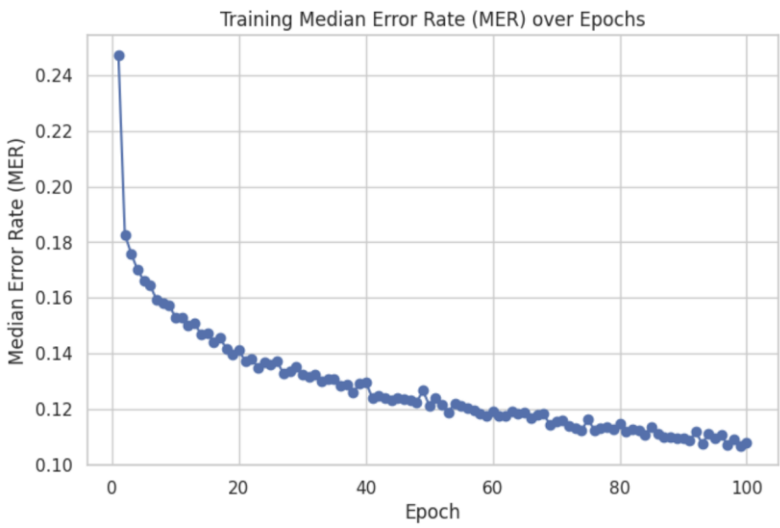
Plot of the training errors for the linear regression model



The linear regression model graph shows the training Median Error Rate (MER) for the linear regression model over 50 epochs. The curve steadily declines from roughly 0.28 to 0.22, indicating that the model's predictions become progressively more accurate as training continues. The line flattens near the end, meaning the model has converged, which means that additional training would not meaningfully reduce error.

However, the final MER of 0.2194 suggests the linear model's performance is limited by its linear nature. It cannot fully capture complex, non-linear relationships among house-price drivers.

Plot of the multi-layer perceptron model



The multi-layer perceptron model plot tracks the training MER for the MLP model across 100 epochs. The error drops sharply early in training, from around 0.24 to 0.12 within the first 20 epochs, and then gradually flattens to a final MER of 0.1075. The steeper decline shows the MLP's ability to learn complex, non-linear patterns that the linear model misses. The flattening at the end indicates convergence. However, we risk overfitting if we don't use regularization methods, cross validation or out of sample testing.

Question 1: What are your final training errors of the multilayer perception model and the linear regression model?

The final error of the multilayer model: MER_last = 0.1075. For the linear model: MER_last = 0.2194

Question 2: What is the test error shown on Kaggle? How does it compare with the train error?

Kaggle shows a score of 0.13442. This is higher than our train error of 0.1075, which is expected since out-of-sample error will always be higher.