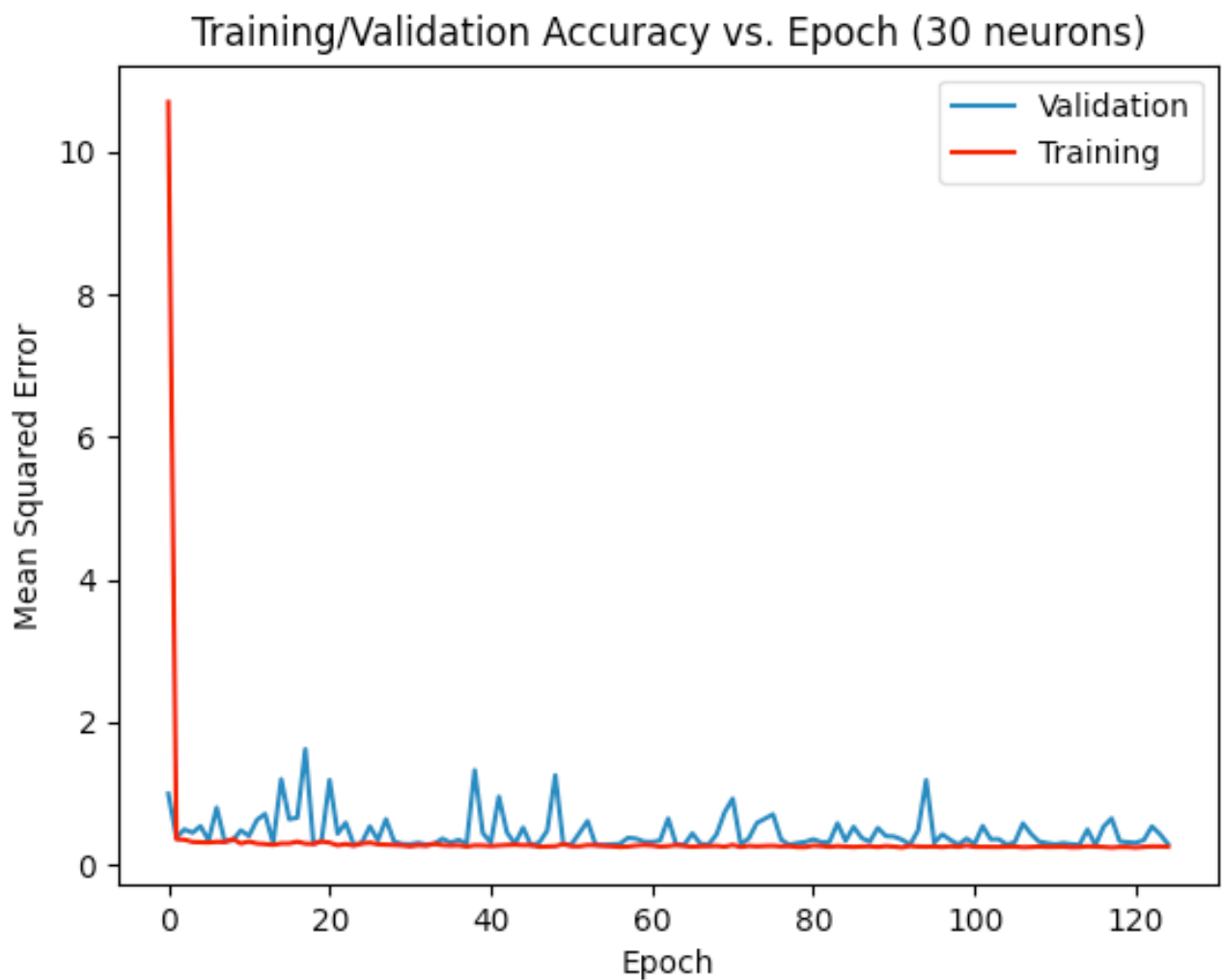
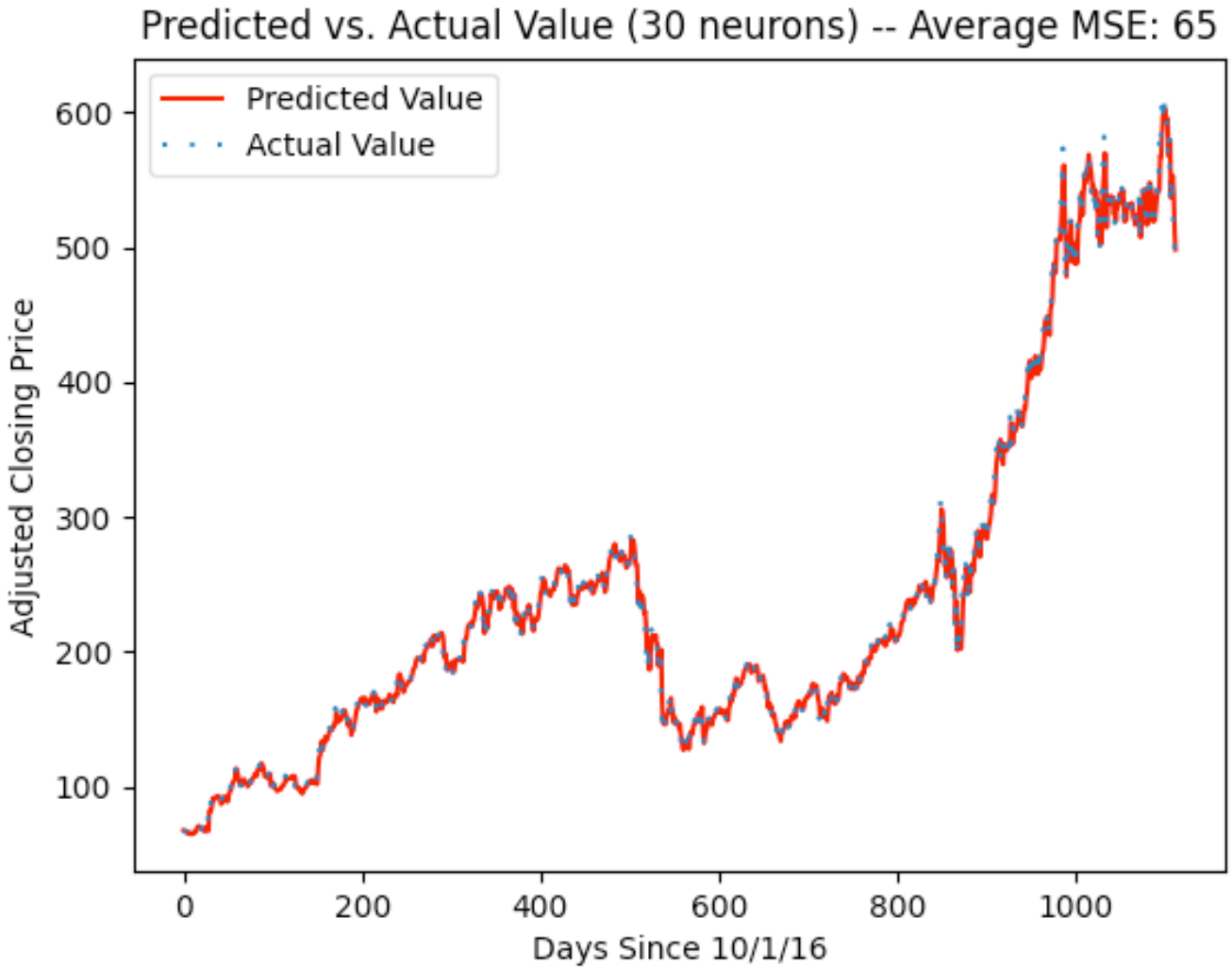


LSTM Stock Market Prediction

The best ANN model I used was 2 hidden layers each with 30 neurons, each with a GELU activation and a linear activation for output. The results are shown below.





I also tried the following combinations with resulting MSEs

- 1 layer, 60 neurons, GELU hidden, RELU output, 81 MSE
- 1 layer, 60 neurons, SIGMOID hidden, RELU output, 103 MSE
- 1 layer, 60 neurons, SELU hidden, linear output, 92 MSE
- 2 layer, 30 neurons each, GELU then RELU hidden, RELU output, 73 MSE
- 2 layer, 30 neurons each, SELU then SELU hidden, RELU output, 80 MSE
- 2 layer, 30 neurons each, GELU then RELU hidden, linear output, 68 MSE

The graph below shows my final results for my best LSTM model. This model has one LSTM layer with 128 blocks and a dense output layer. A problem that I consistently ran into was severe data overfitting. Before normalizing the input data, I would consistently get good training MSEs but my testing MSEs would be $>50,000$. I attempted to correct this by adding more LSTM layers, decreasing the amount of blocks (neurons), and adding dropout, but these did not fix the problem. However, after adding a MinMax scaler to preprocess the data (normalize each point between 0 and 1) I was able to get much better results and lower MSEs compared to both the previous model and without preprocessing (as we can see below).

