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Machine Learning
Lab6 Report

I. When predicting values using sine wave data, is there a performance difference between the model that only contains Dense layers and one that includes an RNN layer? Which performs better?

Given the nature of sine wave data, the model with RNN layers will typically outperform the one with only Dense layers. This is because RNNs can handle time dependencies, while Dense layers cannot effectively capture this type of information. Therefore, a model with RNN layers will usually perform better for time-series data.

II. Have you tried stacking two consecutive RNN layers in the model? How would you configure the parameters for the second RNN layer if the first RNN layer is defined as RNN(1, 16)? Briefly explain your reasoning.

If the first RNN layer is RNN(1, 16), the input to the second layer will be 16 features. You could configure the second RNN layer with 16 or a larger number of hidden units (e.g., 32 or 64), depending on the desired model capacity. Increasing the number of hidden units can improve the model's ability to learn complex patterns, but it also increases the risk of overfitting and computational cost.

III. What would be the effects with the larger size of hidden units in RNN layer?

Increasing the number of hidden units in the RNN layer enhances the model's ability to capture more intricate patterns and time dependencies. However, it also increases the computational cost, training time, and the risk of overfitting. When designing the RNN model, it's important to balance the model's expressiveness with computational efficiency and to possibly use regularization techniques to prevent overfitting.