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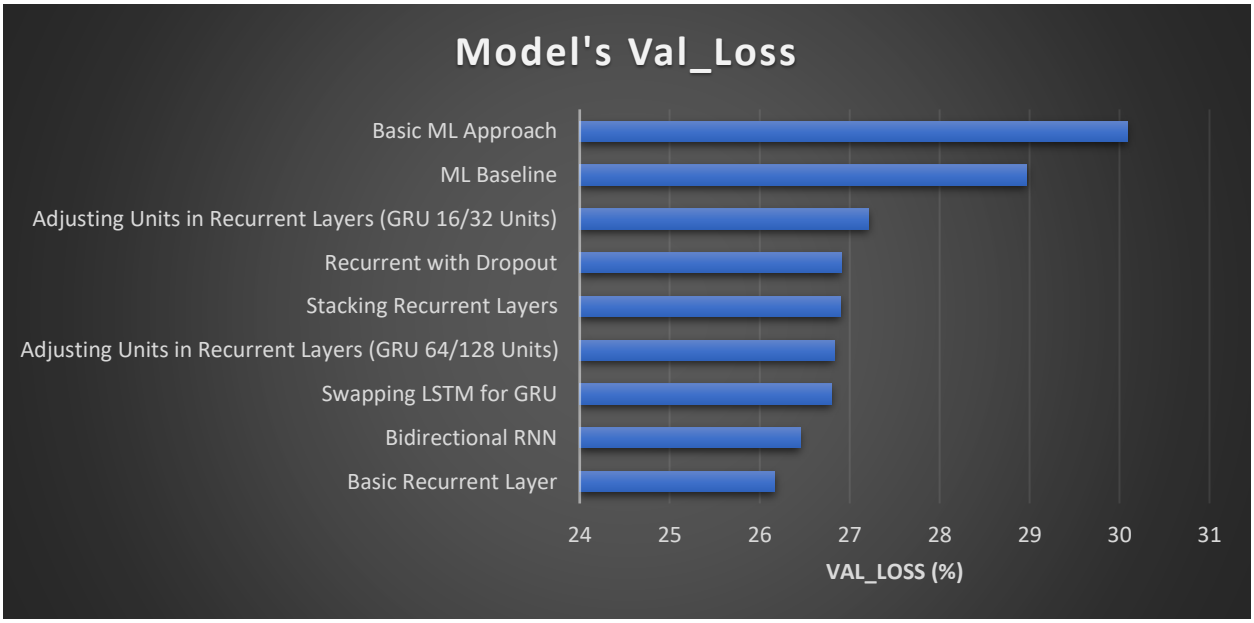
Assignment 4 Summary

For this assignment, we want to be able to predict the weather 24 hours into the future. To do this, we have gathered a dataset from the Max-Planck-Institute for Biogeochemistry in Jena, Germany. This dataset has 14 different variables which include temperature, atmosphere pressure, humidity, etc. These variables have been recorded every 10 minutes since 2003. For this assignment, we are only focusing on data from 2009-2016.

Model	Val_Loss (%)
Basic Recurrent Layer	26.17
Bidirectional RNN	26.45
Swapping LSTM for GRU	26.8
Adjusting Units in Recurrent Layers (GRU 64/128 Units)	26.83
Stacking Recurrent Layers	26.9
Recurrent with Dropout	26.91
Adjusting Units in Recurrent Layers (GRU 16/32 Units)	27.21
ML Baseline	28.97
Basic ML Approach	30.09



In order to predict the weather, I must create a model for the prediction. But which model would be the best to use? To find this out, I need to test several models to determine which would be best. For this experiment, I am going to test the following models, a machine-learning baseline, a basic

machine-learning algorithm, basic recurrent layer, bidirectional RNN, stacking recurrent layers, recurrent layer with dropout, adjusting units in recurrent layers to 64/128 and 16/32, and lastly swapping LSTM for GRU. After running each of the models, I was able to determine the top three models with the smallest amount of val_loss (basic recurrent layer (26.17%), bidirectional RNN (26.45%), and swapping LSTM for GRU (26.80%)). With these three models, I decided to run the test set through them to determine the best model from the bunch. My conclusion is that swapping LSTM for GRU(30.5%) was the best option.

Test Model	Val_Loss (%)
Basic Recurrent Layer	30.83
Bidirectional RNN	32.44
Swapping LSTM for GRU	30.5