Presented By: Amit Kukreja

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MODEL METRICS

Realized Volatility Prediction for Optiver

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1.0 Model Performance Metrics

To predict the future 10-minute volatility, 4 models were built. Below table captures the key performance metrics for each model. The metric used for model evaluation is RMSPE (Root mean squared percentage error).

Model	**RMSPE – Training Data**	**RMSPE – Validation Data**	**RMSPE – Test Data**	**Compute Time (per time_id)**
Neural Network Model (numeric & categorical features)	0.2118	0.2104	0.215365	0.0182 seconds
Neural Network Model (numeric features)	0.2161	0.2127	0.2170	0.0065 seconds
Light GBM Model	0.23355	0.23856		
Linear Model	0.27292	0.28335		
Naive (baseline Model)	0.341			

Table 1.1

2.0 Model Features & Hyperparameter Settings

Table 2.1

MODEL	FEATURES USED	HYPERPARAMETER SETTINGS
Neural Network Model (numeric & categorical features)	Numeric – 179 Categorical – 2	Embedding layer: 1 Dense layers: 3 #Neurons: [200, 200, 100] Activation Fn: LeakyReLU Alphas of LeakyReLU: [0.5,0.3,0.3] Learning Rate: Gradually reduced to 1e-06 using ReduceLROnPlateau() callback
Neural Network Model (numeric features)	Numeric – 179	Dense layers: 3 #Neurons: [200, 200, 100] Activation Fn: LeakyReLU Alphas of LeakyReLU: [0.5,0.3,0.3] Learning Rate: Gradually reduced to 1e-06 using ReduceLROnPlateau() callback
Light GBM Model	Numeric – 179 Categorical – 3	max_depth = 5 learning_rate = 0.01 feature_fraction = 0.6 min_data_in_leaf = 200
Linear Model	Numeric – 91	selectkbest=85