Date	7th November 2024
Team ID	SWTID1727321147
Project Name	Time Series Analysis For Bitcoin Price Prediction using Prophet
Minimum Marks	10 Marks

Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining the Prophet model for peak performance in predicting Bitcoin prices. It includes optimized model code, fine-tuning of hyperparameters, comparing performance metrics, and justifying the final model selection to achieve enhanced predictive accuracy and efficiency.

Hyperparameter Tuning Documentation (8 Marks):

Model	Tuned Hyperparameters	Optimal Values
Prophet	changepoint_prior_scale	0.1
	seasonality_mode	multiplicative
	yearly_seasonality	True
ARIMA	p, d, q (ARIMA order)	(5, 1, 0)
SARIMA	p, d, q, P, D, Q, S (SARIMA order)	(1, 1, 1, 1, 1, 1, 12)
LSTM	hidden_units, learning_rate, epochs	128, 0.001, 50

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Prophet	Prophet was selected as the final model because of its ability to capture seasonality, trends, and holiday effects efficiently. It offers interpretable predictions and fits well with financial time series data, ensuring robustness and accuracy in Bitcoin price forecasting.