Fig 1 **Closing Price**

The daily closing price trend over time.

Fig 2 **RSI (Relative Strength Index)**

Identifies overbought (>70) and oversold (<30) conditions.

Fig 3 **MACD (Moving Average Convergence Divergence)**

A trend-following momentum indicator.

Use this analysis to identify trading opportunities and assess market trends.

Fig 4 **Backtest Results**

The green line represents the portfolio value over time.

This backtest simulates an automated trading strategy based on technical indicators.

Trading Rules Applied:

Buy when RSI is rising and price is higher than 3 days ago (ensures uptrend confirmation).

Sell only if price has increased by at least 2% since buying (prevents premature exits).

MACD and Moving Averages are used for additional trade confirmation.

Key Notes:

Portfolio value changes based on executed trades.

The system avoids unnecessary trades by ensuring multiple confirmations before buying or selling.

Unlike basic strategies, this approach prevents buying in a downtrend and avoids frequent stop-outs.

This backtest provides a realistic view of potential trading performance, but real-world trading includes slippage, execution delays, and psychological factors.

Fig 5 and Fig 6 **Training Loss vs Validation Loss Plot, LSTM and XGBoost.**

Training Loss (Blue Line)

Represents how well the model is performing on the training data.

The loss should decrease over epochs as the model learns patterns.

Validation Loss (Orange Dashed Line)

Represents how well the model is generalizing to unseen validation data.

If the model generalizes well, the validation loss should follow a similar decreasing trend as the training loss.

Fig 7 **Training Loss vs Validation Loss Plot, Gaussian Process**

The Gaussian Process (GP) RMSE plot has no distinct training and validation lines because GP is a non-parametric model that makes predictions based on the entire dataset rather than iteratively updating weights like XGBoost or LSTM.

Instead of stepwise learning, GP optimizes a kernel function over all data points at once, leading to a single, stable error value rather than a progressive learning curve.

Fig 8 **Model Evaluation Metrics**

The Model Evaluation Metrics plot compares key performance metrics (e.g., RMSE, MAE, R^2) across different models.

Lower RMSE and MAE indicate better accuracy, while higher R^2 suggests a stronger fit to the data.

Fig 9 – 11 **Time Series Forecast**

The Time Series Forecast plots show actual vs. predicted values over time, with a confidence interval indicating the uncertainty in predictions. A good model should closely follow the actual trend while maintaining a reasonable confidence range.

A wider confidence interval suggests higher uncertainty, while a narrower interval indicates greater confidence in the predictions.