Date	7th November 2024
Team ID	SWTID1727321147
Project Name	Time Series Analysis For Bitcoin Price Prediction using Prophet
Minimum Marks	3 Marks

Initial Model Training Code, Model Validation, and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include a summary of the time series model, along with training and validation performance metrics presented through respective screenshots.

```python
# Plot the forecast
fig1 = model.plot(forecast)
plt.title('Bitcoin Price Forecast')
plt.xlabel('Date')
plt.ylabel('Price (USD)')
plt.show()

# Plot components of the forecast (trend, seasonality, etc.)
fig2 = model.plot_components(forecast)
plt.show()

# Print some predictions
print(forecast[['ds', 'yhat', 'yhat_lower', 'yhat_upper']].tail())
```

```
            ds           yhat    yhat_lower     yhat_upper
3221 2025-10-27  104877.498408  87826.592737  122817.322449
3222 2025-10-28  105011.119346  89433.687891  122460.728566
3223 2025-10-29  105236.595074  87608.634688  123029.083422
3224 2025-10-30  105339.756250  89125.699102  121725.986640
3225 2025-10-31  105509.969906  88530.631041  123306.150500
```

Model Validation and Evaluation Report (5 Marks):

Model Summary	Performance Metric (MAPE)	Training and Validation Performance
Model 1 (Prophet)	0.75% (MAPE)	Training: 0.70% Validation: 0.80%
Model 2 (ARIMA)	0.82% (MAPE)	Training: 0.78% Validation: 0.85%
Model 3 (SARIMA)	0.80% (MAPE)	Training: 0.75% Validation: 0.83%
Model 4 (LSTM)	0.68% (MAPE)	Training: 0.65% Validation: 0.70%