

# TIME SERIES FOR THE NUMBER OF ACCIDENTS





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Our Team

# **DATA**

Selected a Dataset from **Kaggle**.

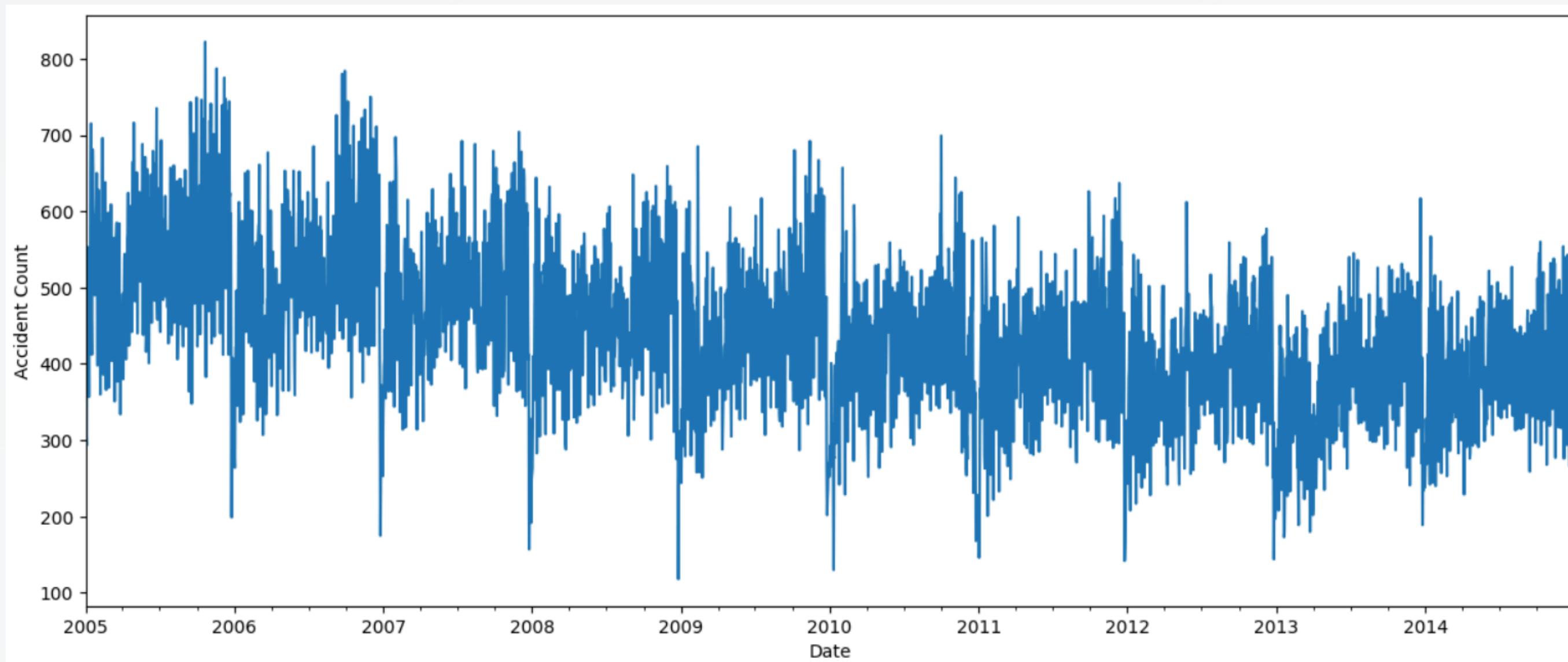
Dataset Name:

UK Accidents 10 years history with many variables.

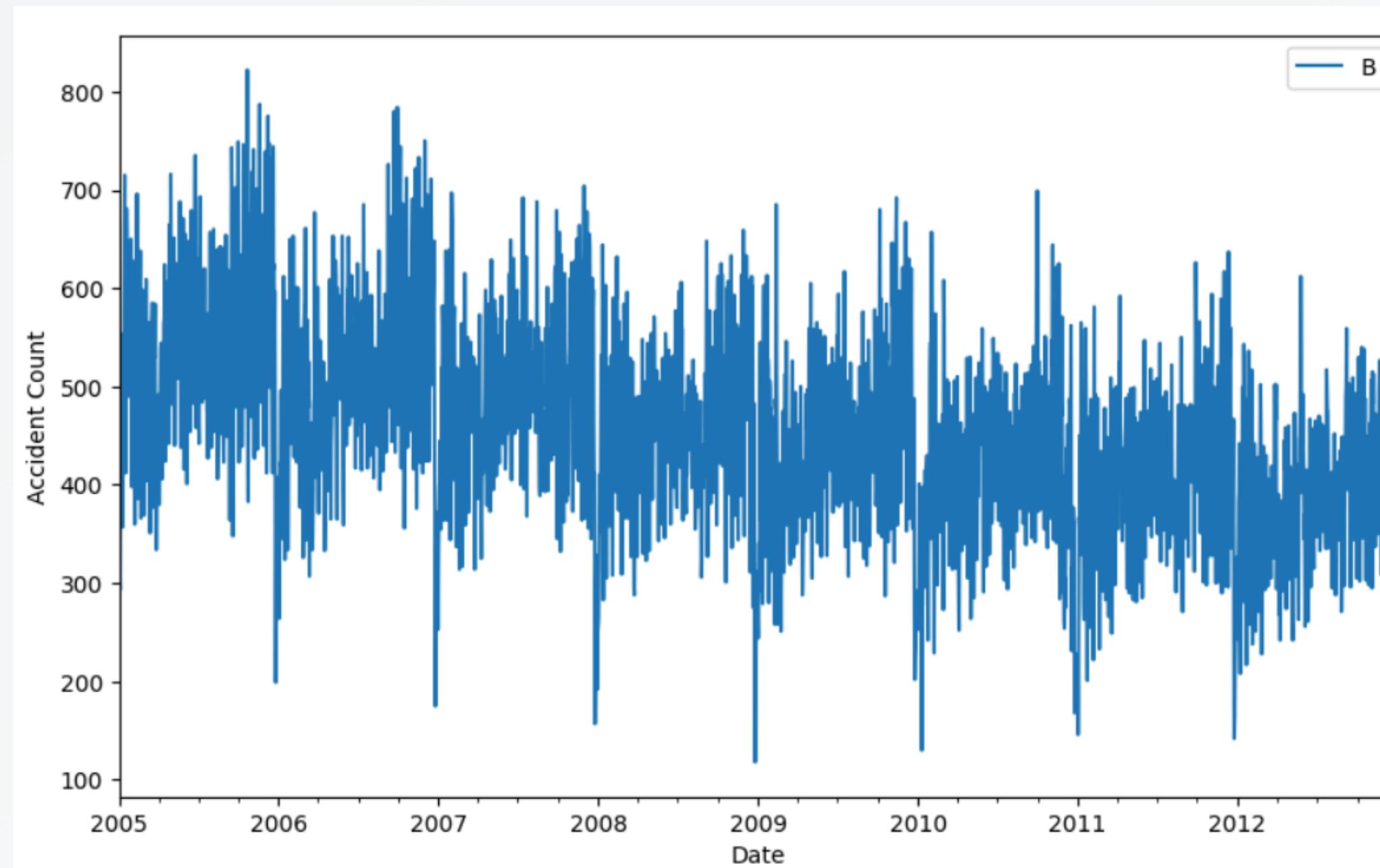
# GOALS

- 01** Forecasting the number of accidents for the upcoming year.
  
- 02** Detecting abnormal spikes or dips in accident number of accidents underlying causes and implement preventive measures.

# DATAFRAME: ACCIDENT COUNT

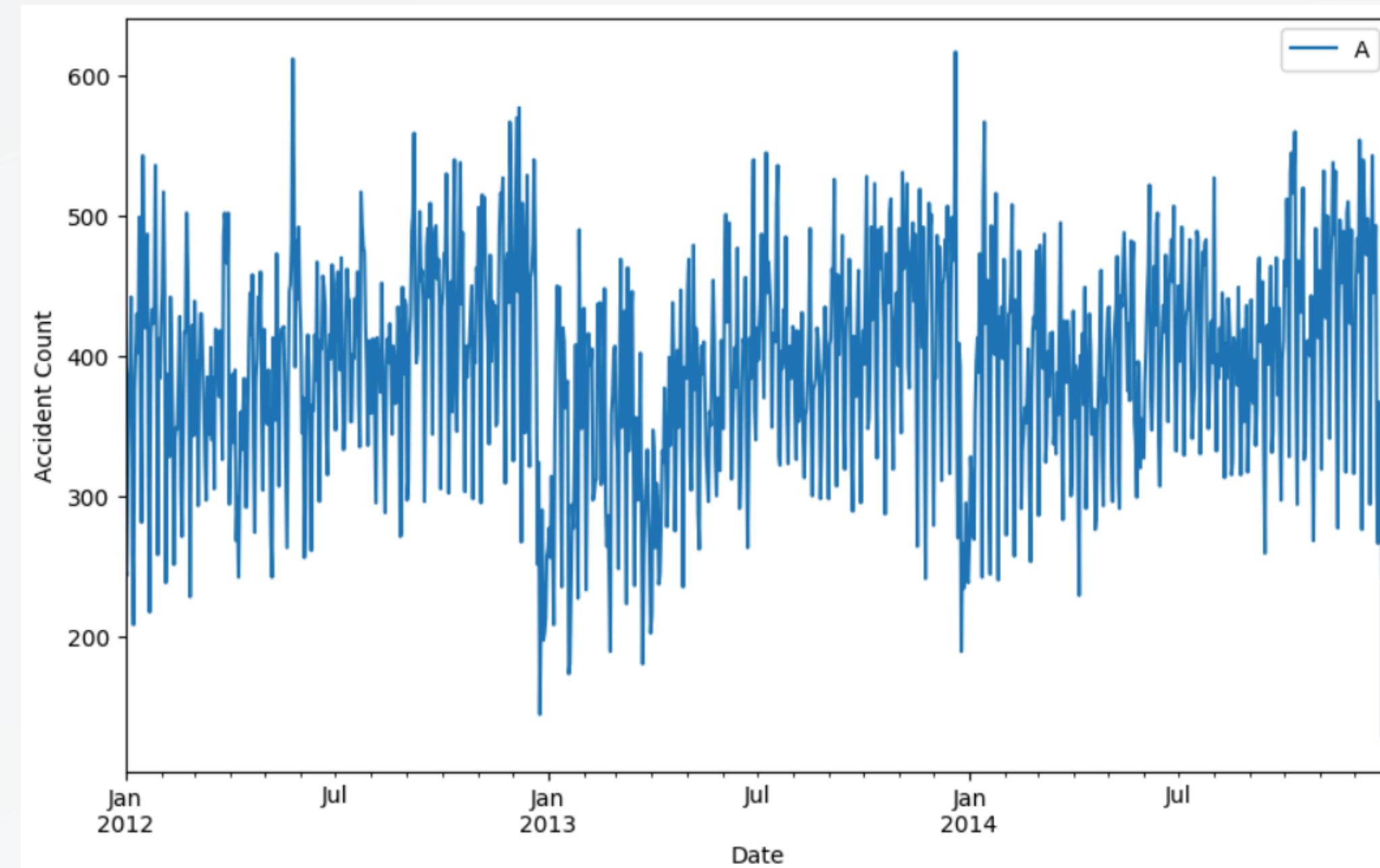


# ACCIDENT COUNT



Before 2012

# ACCIDENT COUNT



After 2012

# **SPLITTING THE DATFRAME**

**Training set** consisting of data **from 2005 to 2012**.

**Testing set** containing data from **2012 onwards**.

Shape of the training set	Shape of the testing set
(2922, 1)	(1096, 1)

# **MODELS**

Building and training the **GRU**, **LSTM**, and **ARIMA** models.

# GRU MODEL

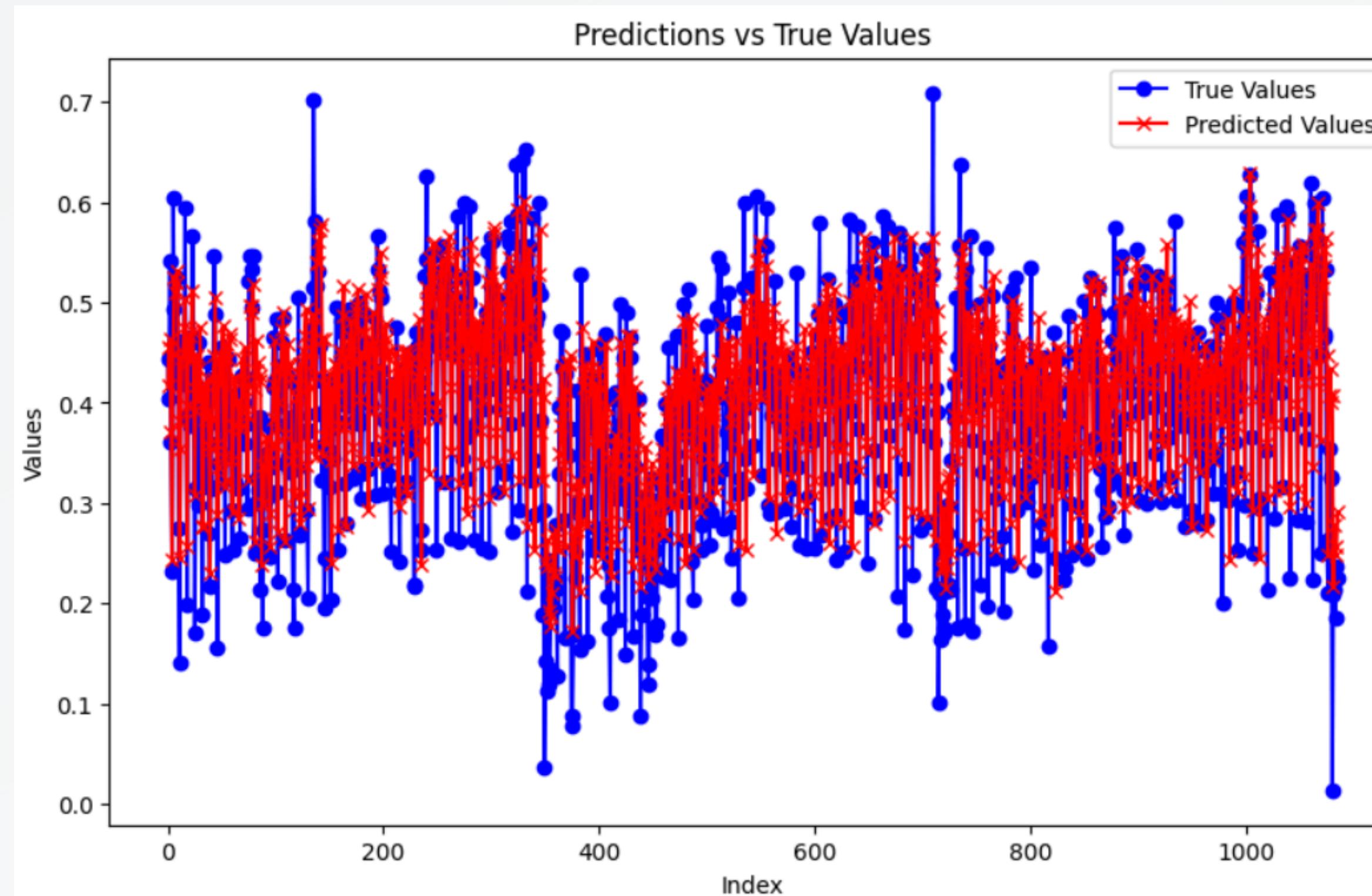
Layer (type)	Output Shape	Param #
gru_12 (GRU)	(None, 10, 200)	121,800
gru_13 (GRU)	(None, 64)	51,072
dense_8 (Dense)	(None, 1)	65

Total params: 172,937 (675.54 KB)

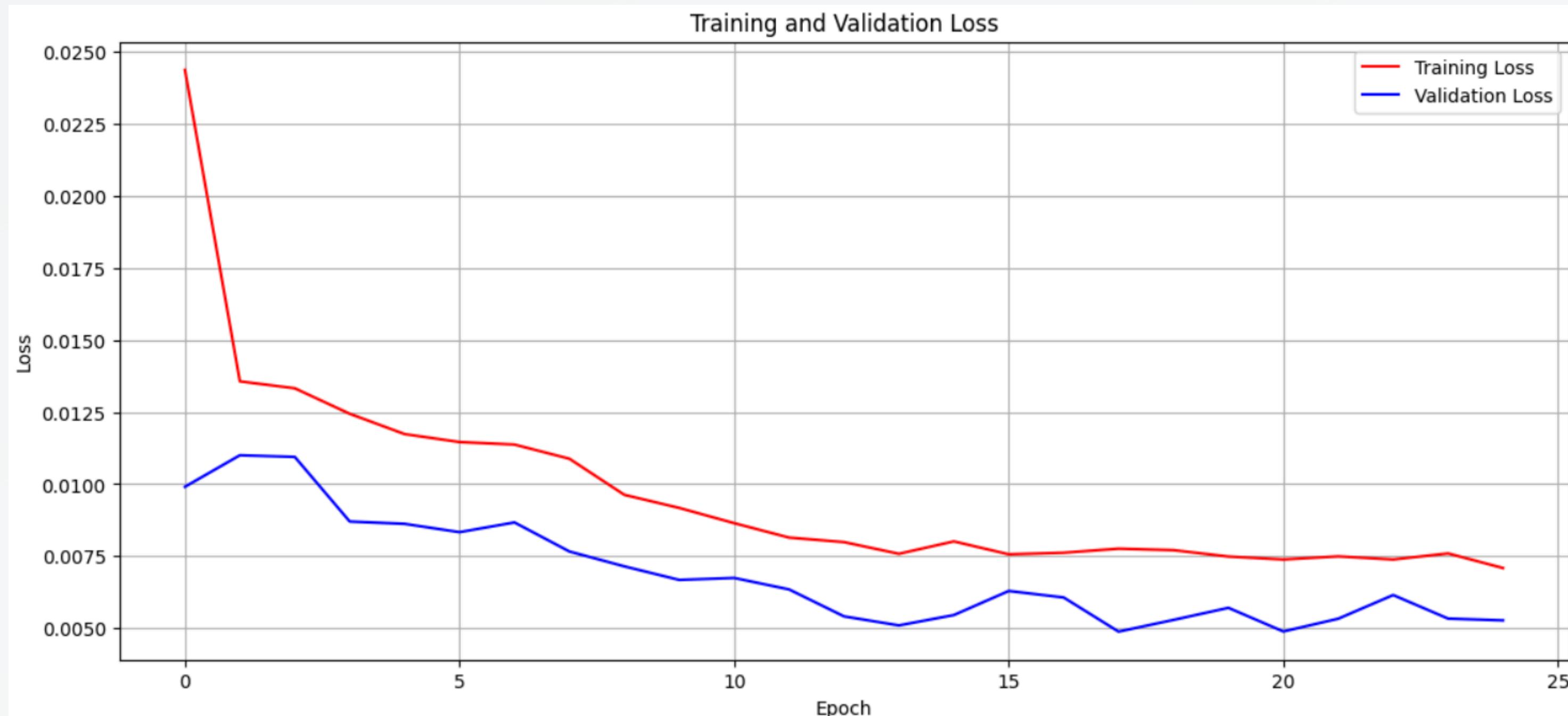
Trainable params: 172,937 (675.54 KB)

Non-trainable params: 0 (0.00 B)

# GRU MODEL



# GRU MODEL



# LSTM MODEL

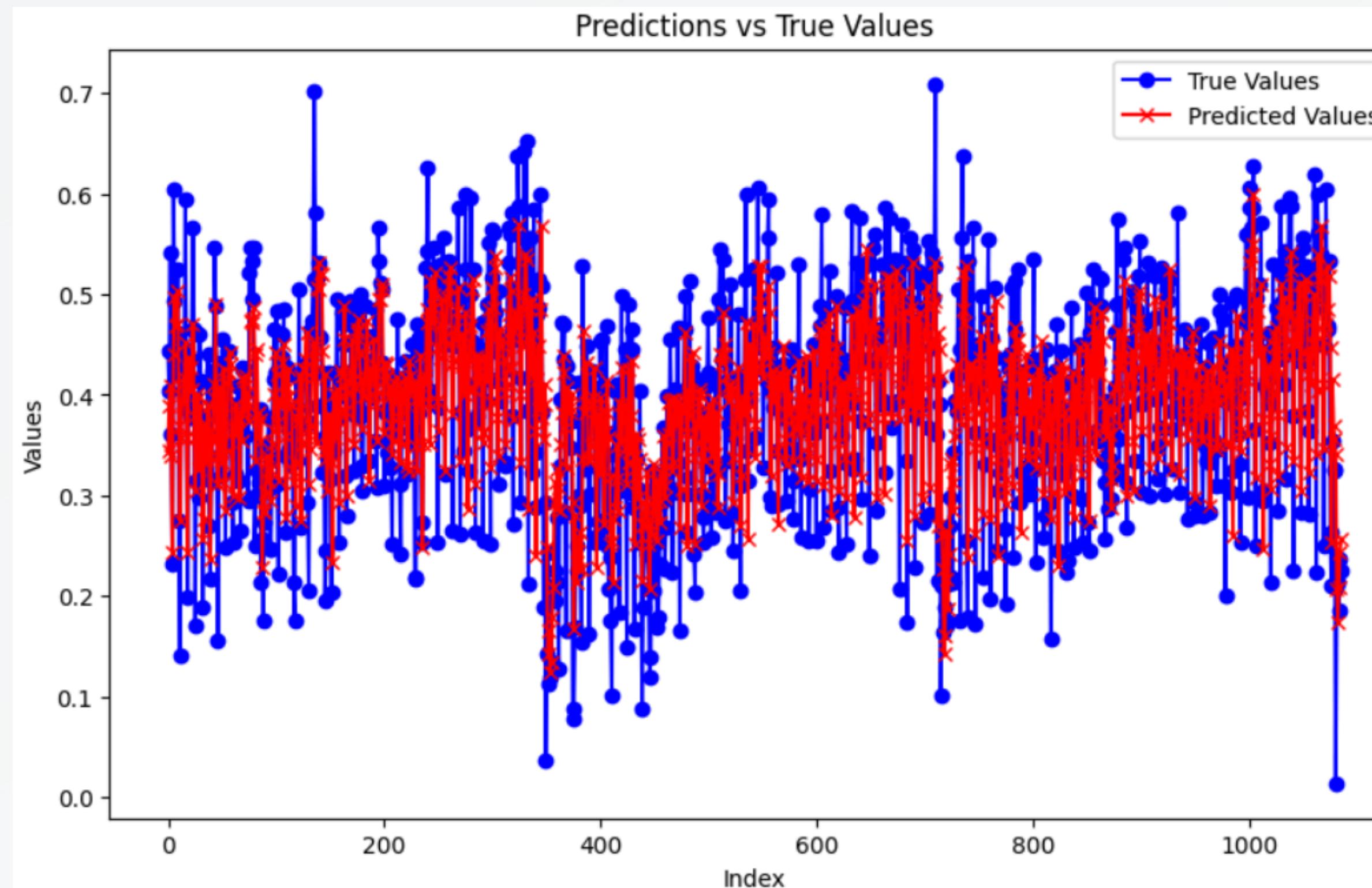
Layer (type)	Output Shape	Param #
lstm_2 (LSTM)	(None, 10, 128)	66,560
lstm_3 (LSTM)	(None, 64)	49,408
dense_3 (Dense)	(None, 1)	65

**Total params:** 116,033 (453.25 KB)

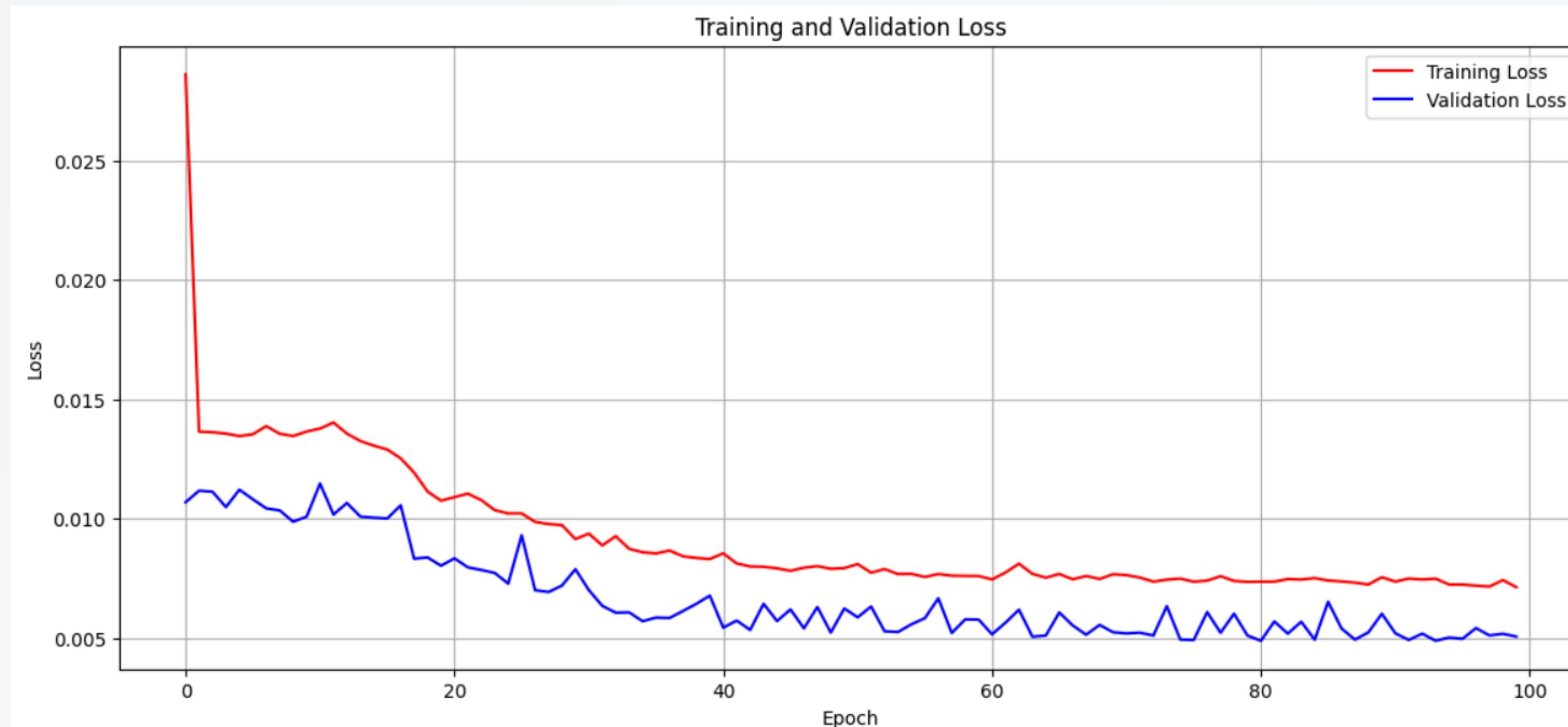
**Trainable params:** 116,033 (453.25 KB)

**Non-trainable params:** 0 (0.00 B)

# LSTM MODEL



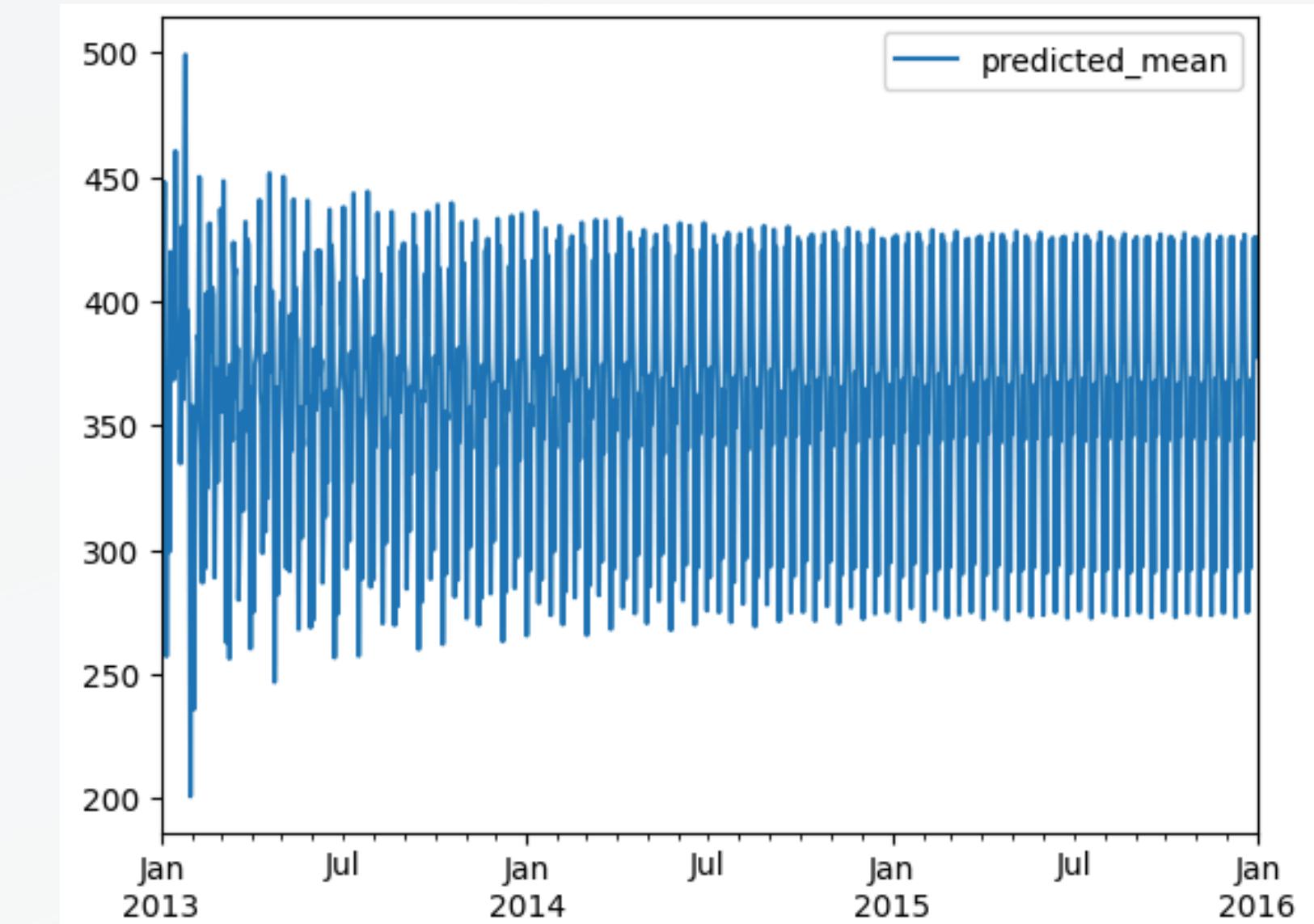
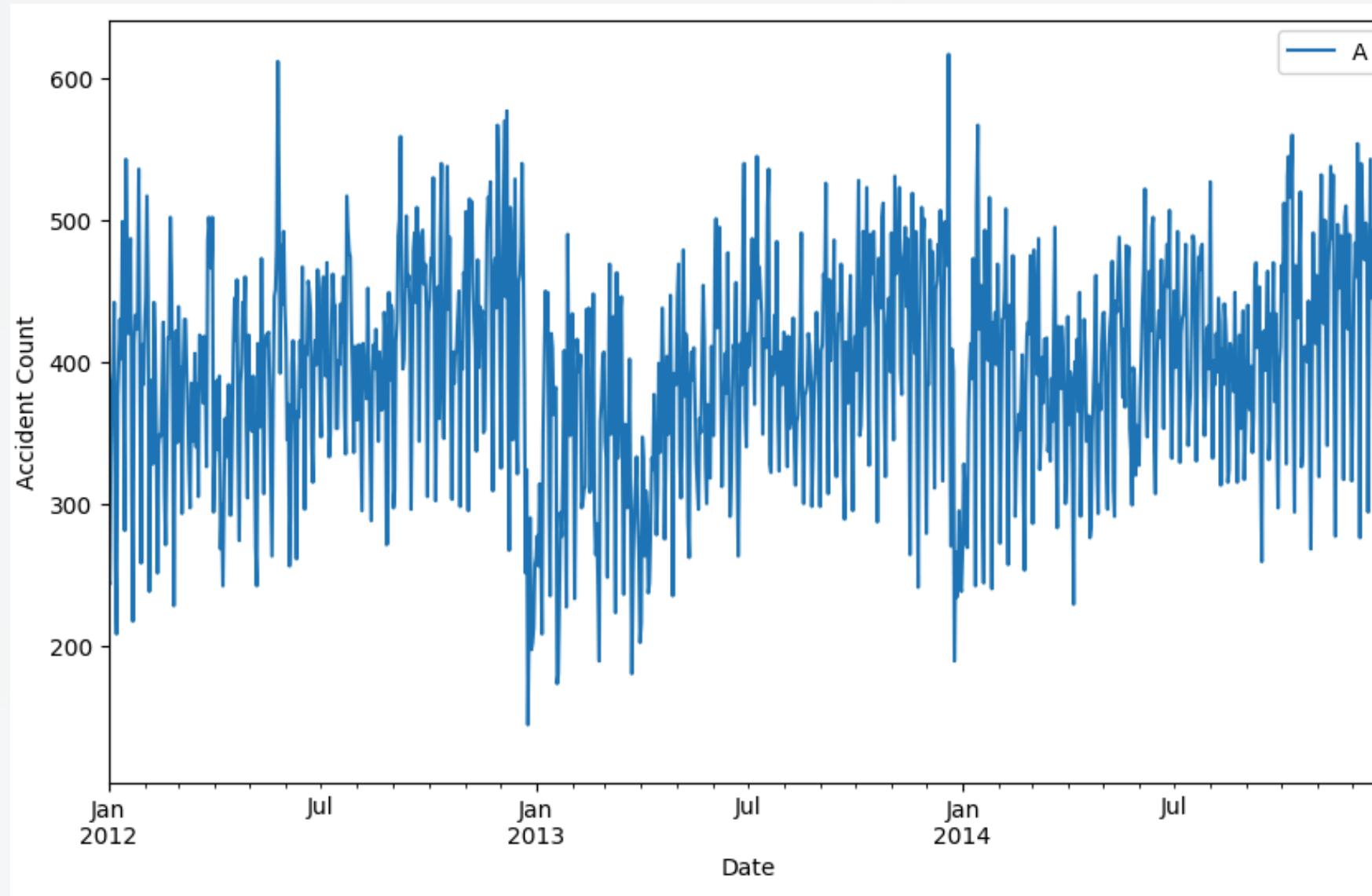
# LSTM MODEL



# **ARIMA MODEL**

- first we used Auto ARIMA function
- SARIMAX
- high accuracy at first
- underwhelming seasonality recognition

# ARIMA MODEL



# **FUTURE WORK**

- Applying the model on real data in Riyadh in several ways.
- Applying the model to weekly real-time data.

# **OUR TEAM**

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Suliman Alotaibi

Ziyad Bin Tuwaim



**THANK YOU FOR  
LISTENING!**