

Ware-Assistant

GROUP-3

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The background features a large blue semi-circle on the left side. In the top right, there is a green circle and a yellow triangle. On the far right, there are two vertical yellow dashed lines and a yellow square. In the bottom right, there are four yellow dashed lines of varying lengths and orientations.

Business problem

Why do we Need Ware-Assistant ?

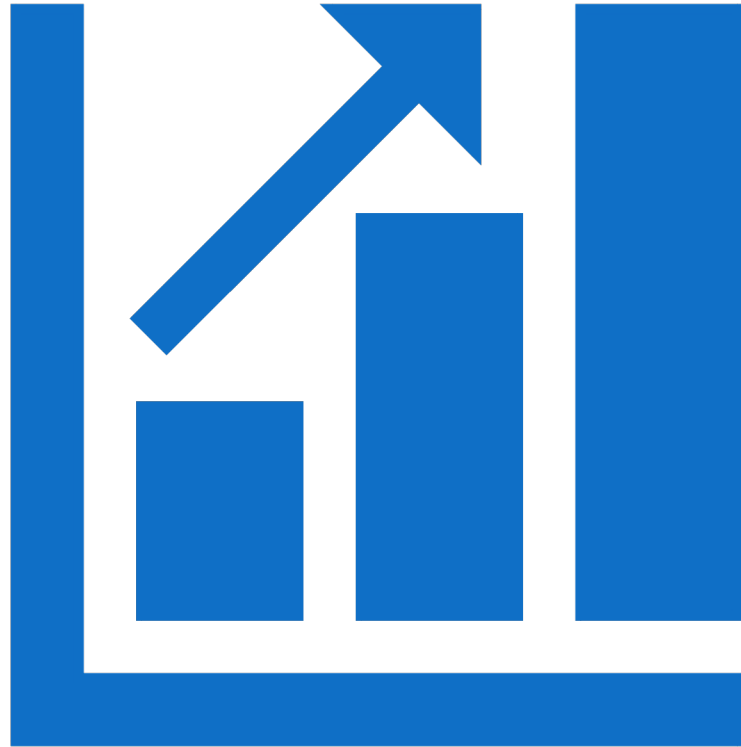
“Correct stock in your Warehouse leads to Max Profits”



What does Ware-Assistant do?

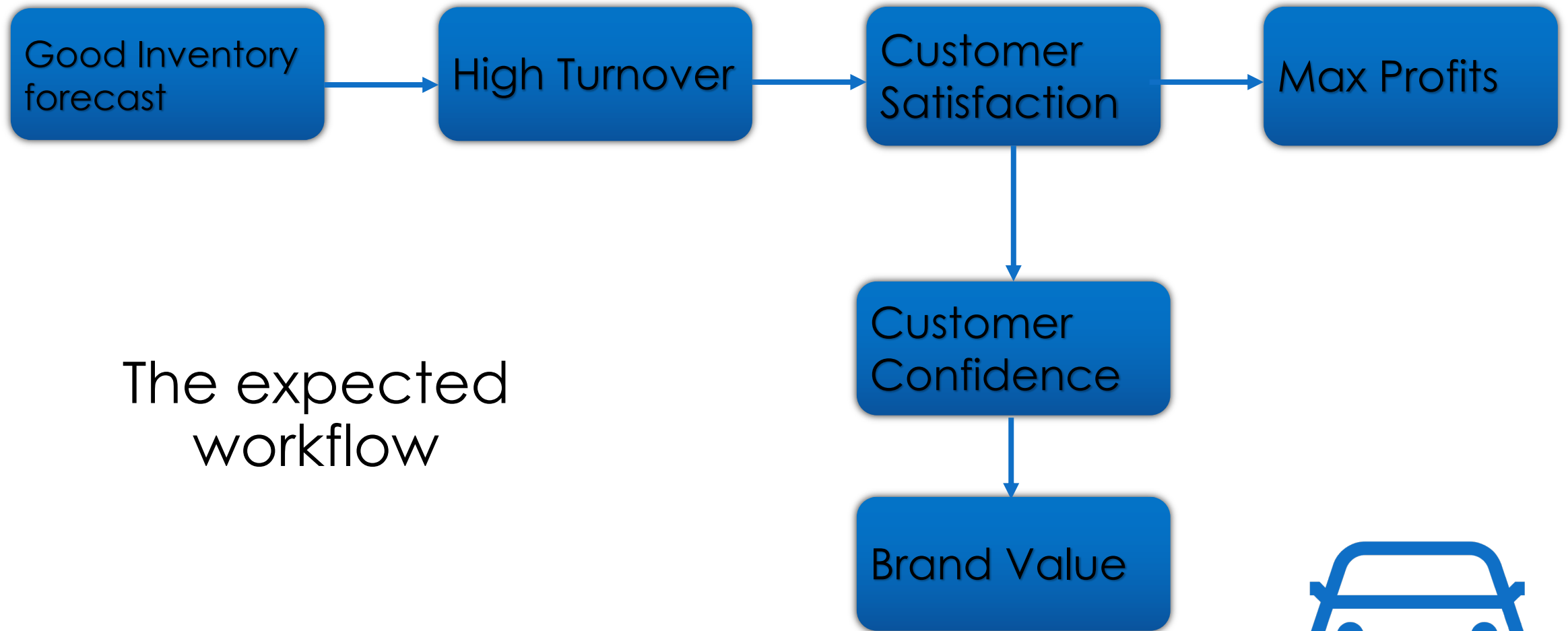
- It helps business owners structure the warehouses such that the business makes maximum profits.
- It provides one with the detailed future inventory list for each and every product retailed by that particular business.
- Ware-Assistant helps protect the business helps it bloom





Our Objective

- Projecting sales figures
- Planning for peaks in customer demand is crucial to maintaining a successful business and keeping customers happy.
- Poor planning can have far-reaching negative consequences on a business's operations, growth, and reputation.
- poor forecasted sales can lead to:
 - Understaffing
 - Incorrectly budgeting for operations
 - Loss of credibility



The expected workflow





Data Understanding

About the Dataset

	Sr.No	Model	Color	VIN	Purchase Date	Sale Date	Ageing
0	33	MARUTI EECO 5 STR WITH A/C	SUPERIOR WHITE	MA3ERLF1S00444785	2016-01-04	2016-01-11	7
1	34	MARUTI EECO 5 STR WITH A/C	SUPERIOR WHITE	MA3ERLF1S00444880	2016-01-05	2016-01-13	8
2	189	MARUTI WAGON R VXI AMT	SUPERIOR WHITE	MA3EWDE1S00992476	2016-01-05	2016-01-13	8
3	284	Maruti Ertiga VDI SHVS	SILKY SILVER	MA3FLEB1S00365043	2016-01-05	2016-01-18	13
4	6	MARUTI SWIFT VXI BSIV	METALLIC GLISTENIG GREY	MA3EHKD1S00A33586	2016-01-08	2016-01-19	11
...
15475	15475	MARUTI DZIRE ZXI+ 1.2L ISS 5MT	PEARL ARCTIC WHITE	MBHCZFB3SMH140883	2021-08-19	2021-08-31	12
15476	15477	MARUTI DZIRE ZXI+ 1.2L ISS AGS	MET.MAGMA GRAY	MBHCZFB3SMH144184	2021-08-28	2021-08-31	3
15477	15478	MARUTI DZIRE VXI 1.2L ISS 5MT	PEARL ARCTIC WHITE	MBHCZFB3SMH144988	2021-08-30	2021-08-31	1
15478	15479	MARUTI DZIRE VXI 1.2L ISS 5MT	PEARL ARCTIC WHITE	MBHCZFB3SMH145197	2021-08-30	2021-08-31	1
15479	15480	MARUTI DZIRE VXI 1.2L ISS 5MT	PEARL ARCTIC WHITE	MBHCZFB3SMH145198	2021-08-30	2021-08-31	1

15480 rows × 7 columns

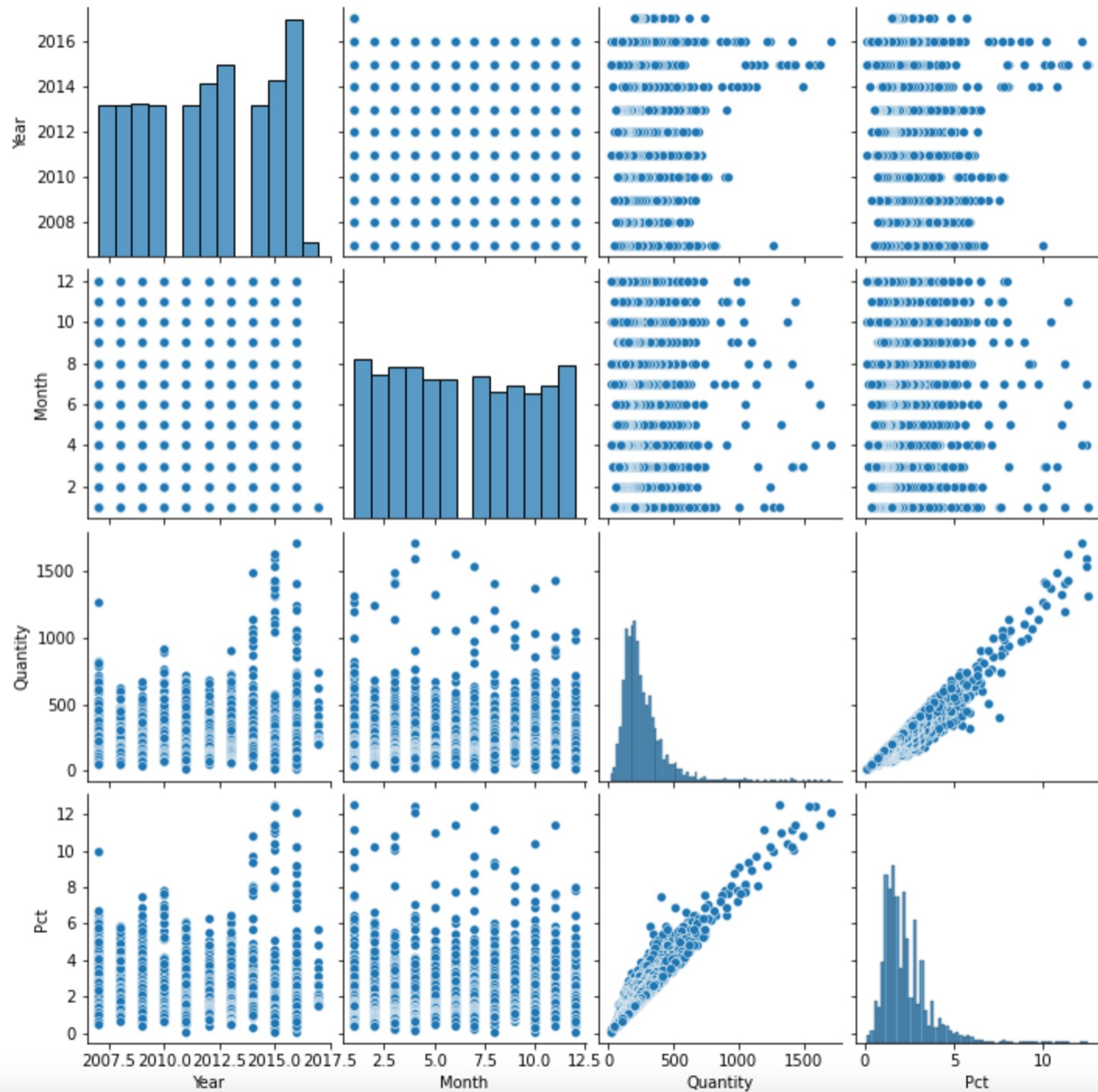


Natural Dataset
Obtained from an Indian car dealership
agency

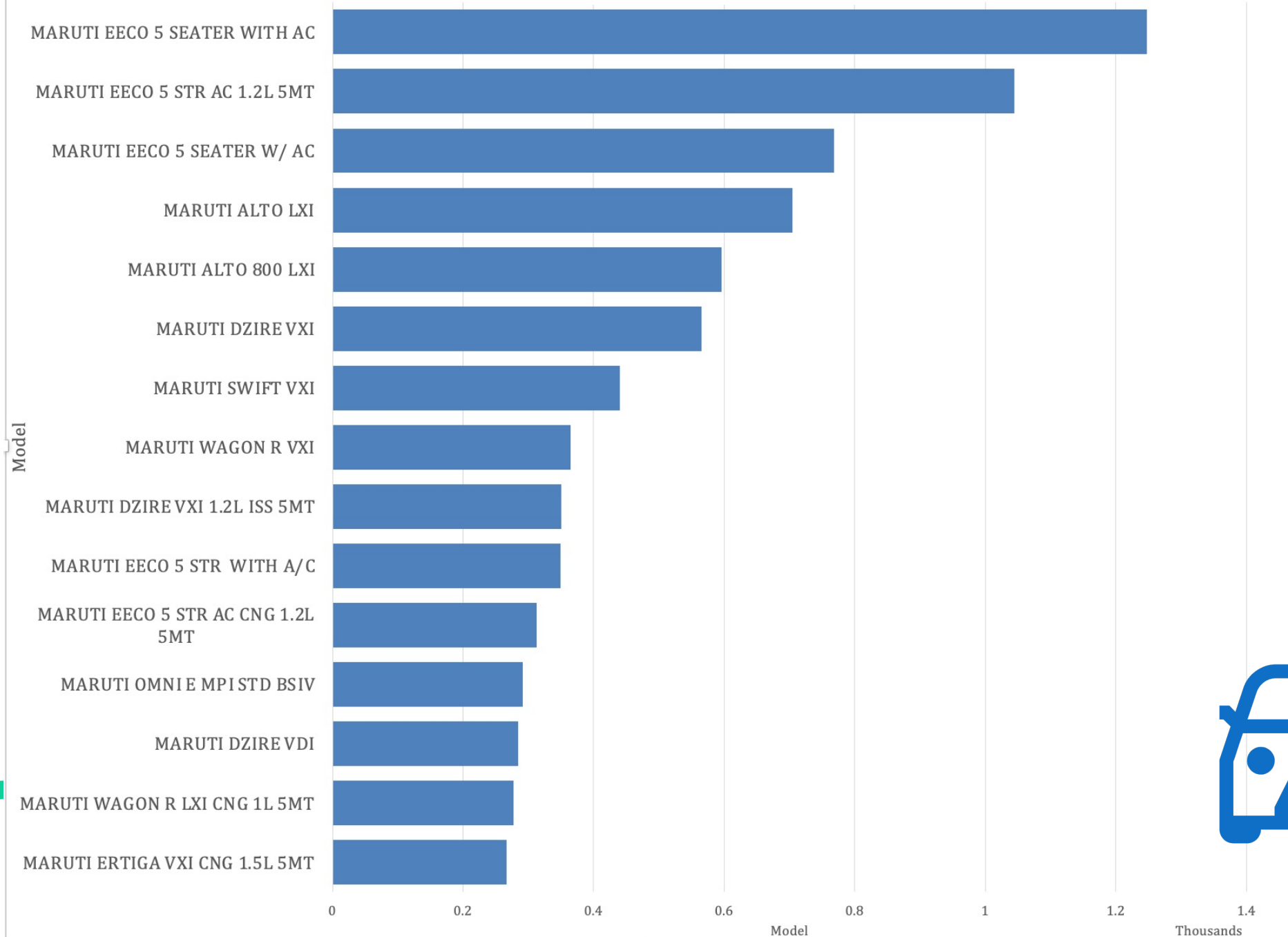
The dataset consists of 5
features and 15480 entries

Car sales from January
2016 till October 2021

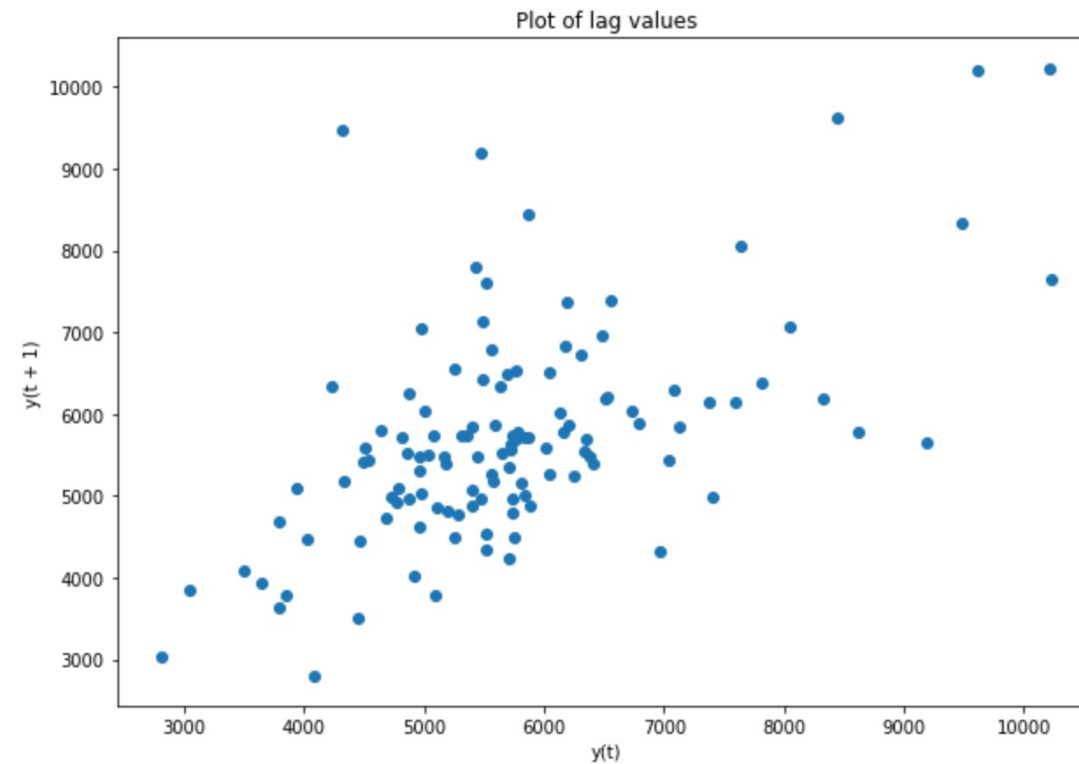
Data Analysis



Model V/S Frequency

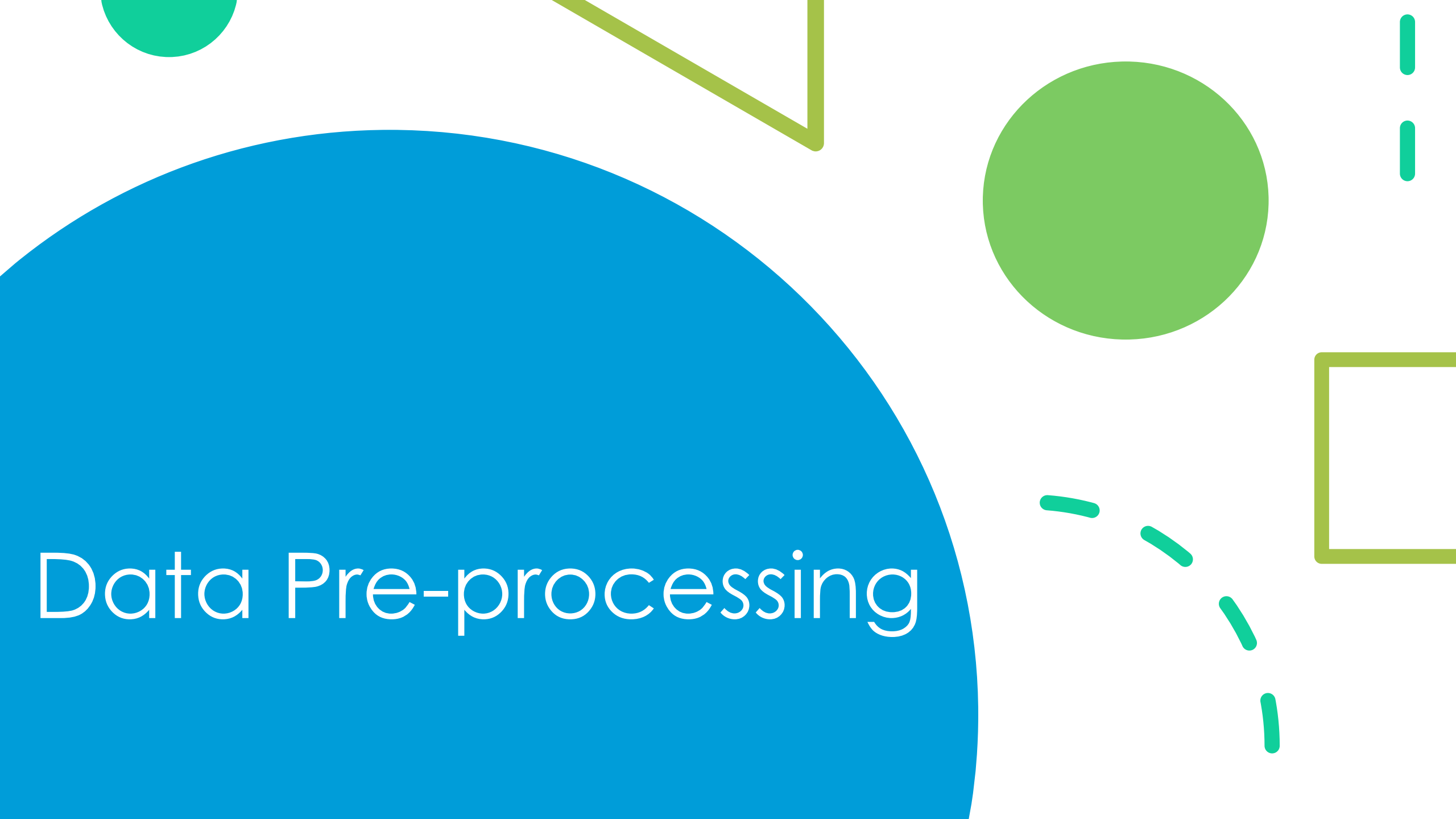


Time series analysis



Lag plot





Data Pre-processing

Data Transformation

- Data cleaning → Removed null values and imputed average sales figures.
- Outlier removal.
- Aggregated daily data into monthly data
- Data transformation → Conversion of non – stationary data to stationary data

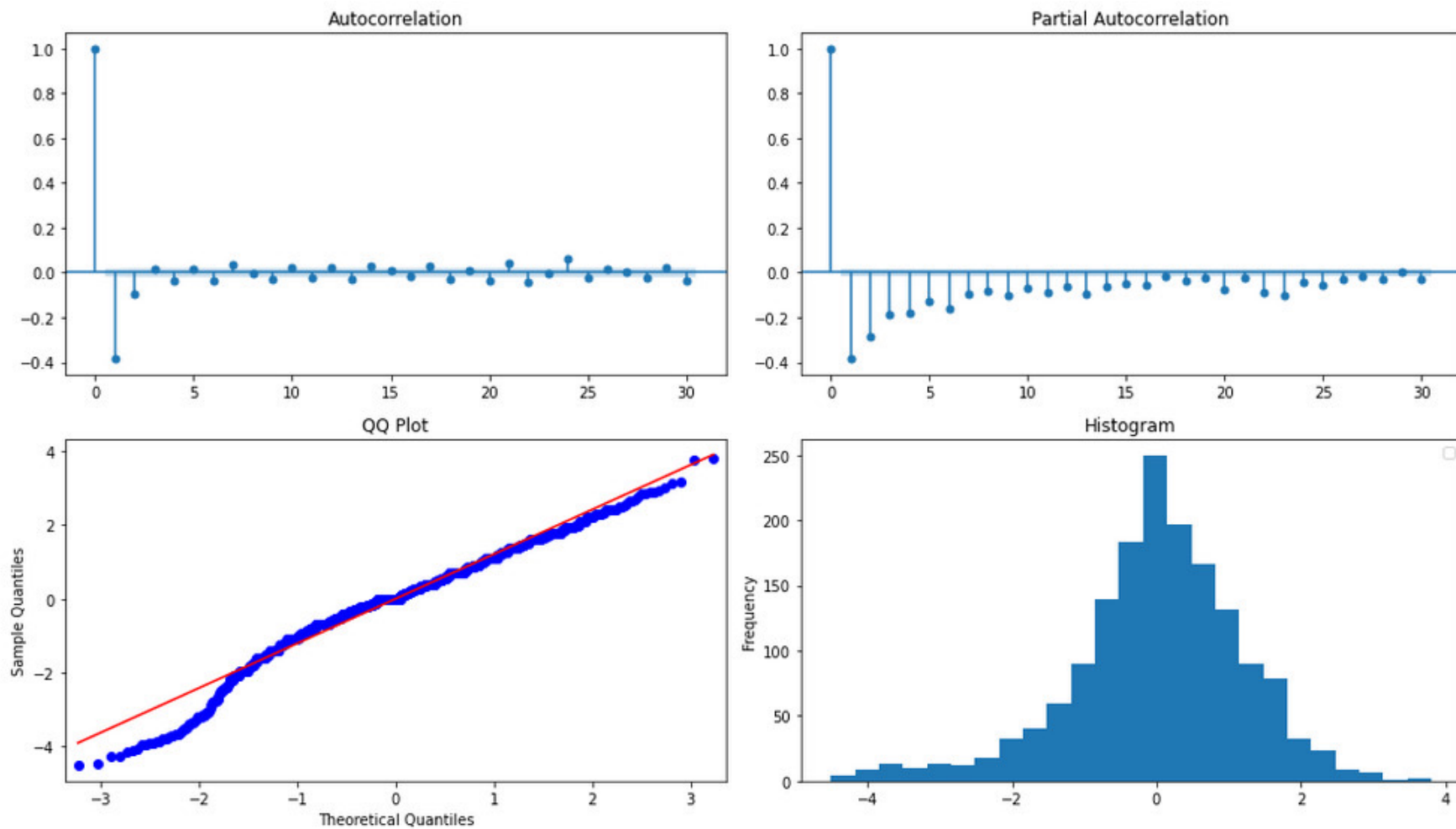
	Sale Date	sales
0	2016-01-01	45
1	2016-02-01	95
2	2016-03-01	142
3	2016-04-01	125
4	2016-05-01	148
...
63	2021-04-01	205
64	2021-05-01	190
65	2021-06-01	284
66	2021-07-01	287
67	2021-08-01	325

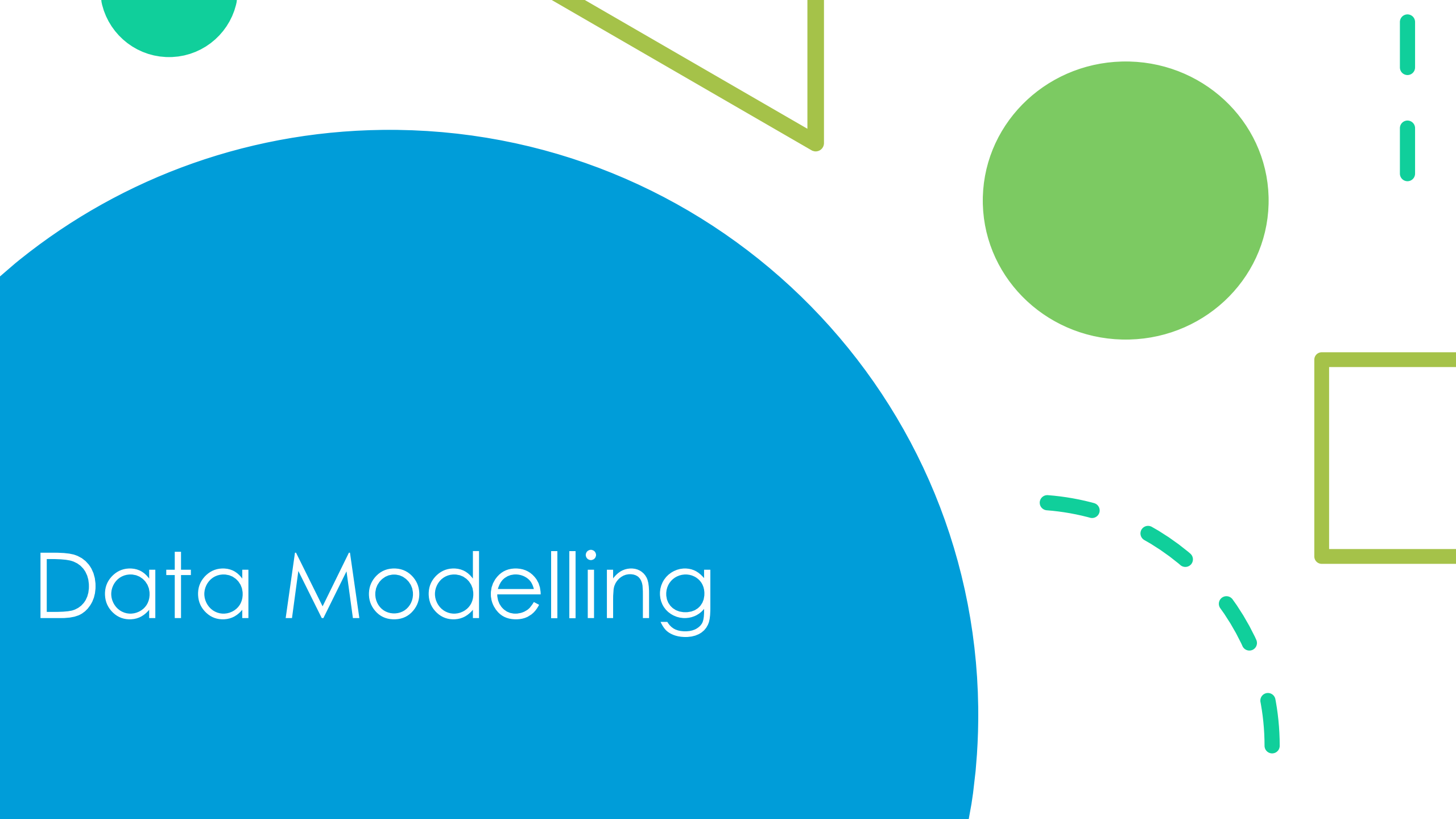
68 rows × 2 columns

Data frame after transformation



Diagnosis(y-diff)





Data Modelling

LSTM structure

Model: "sequential_10"

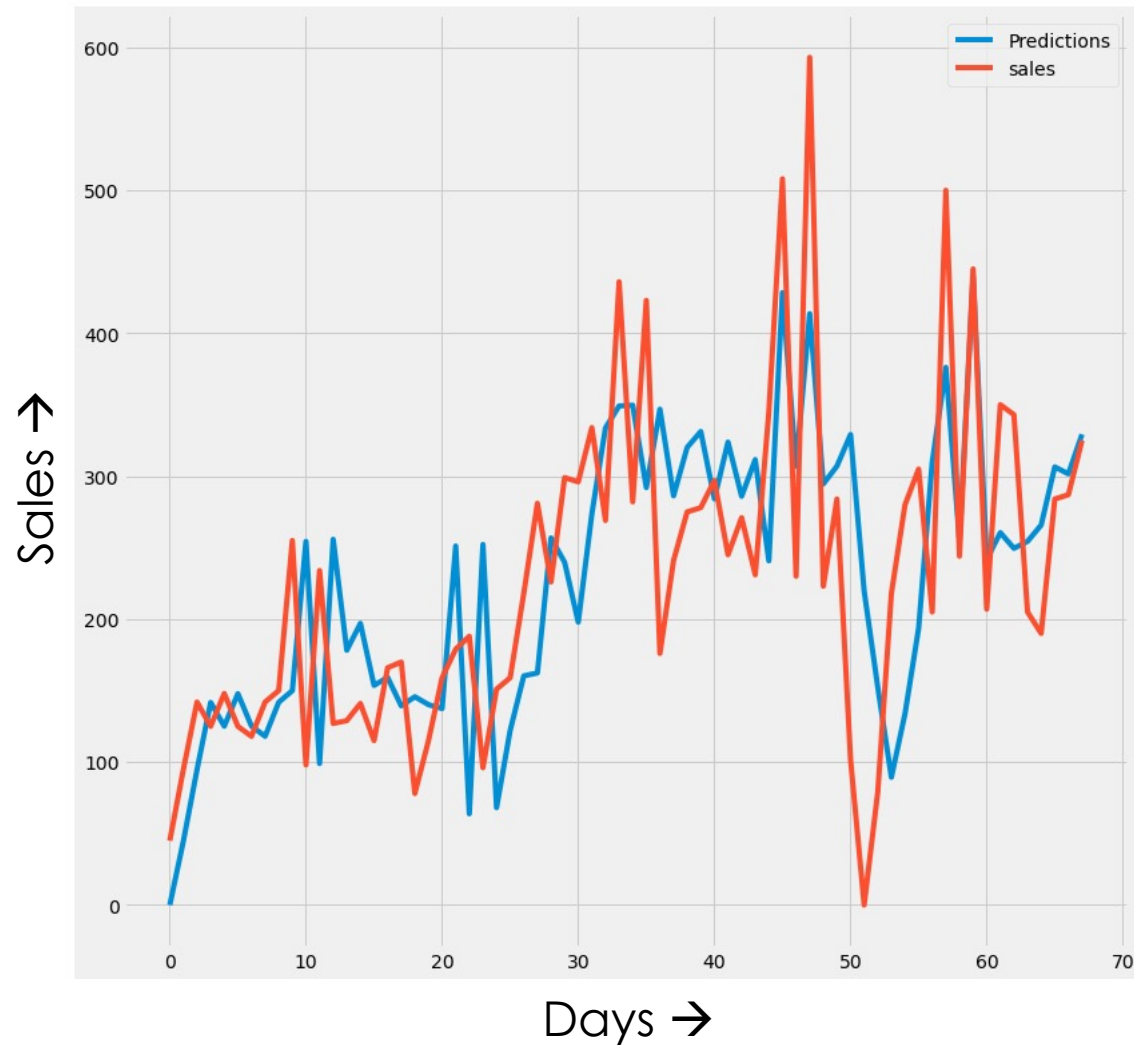
Layer (type)	Output Shape	Param #
lstm_12 (LSTM)	(None, 1, 5)	360
dropout_12 (Dropout)	(None, 1, 5)	0
dense_10 (Dense)	(None, 1, 1)	6

Total params: 366

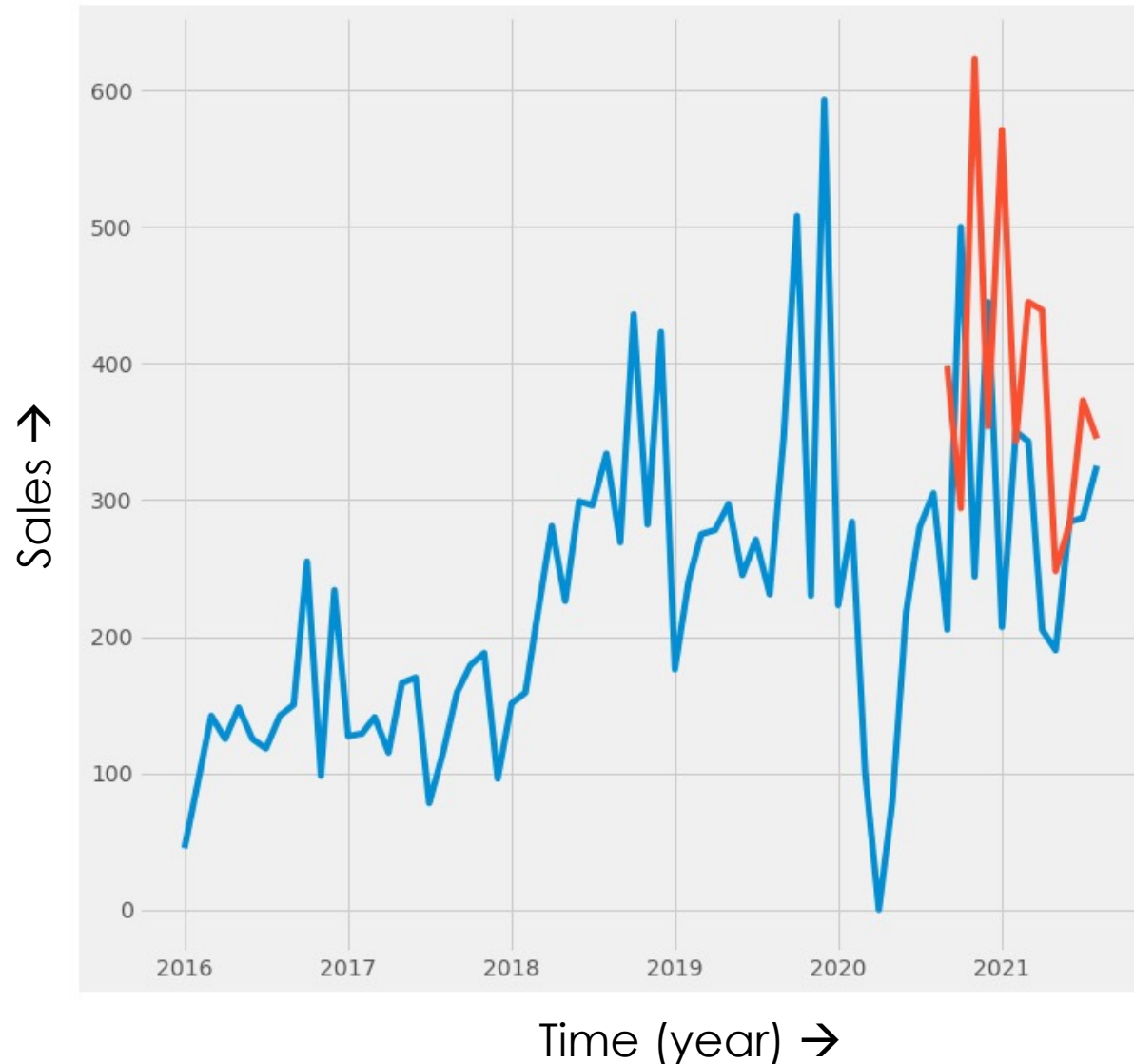
Trainable params: 366

Non-trainable params: 0

ARIMA



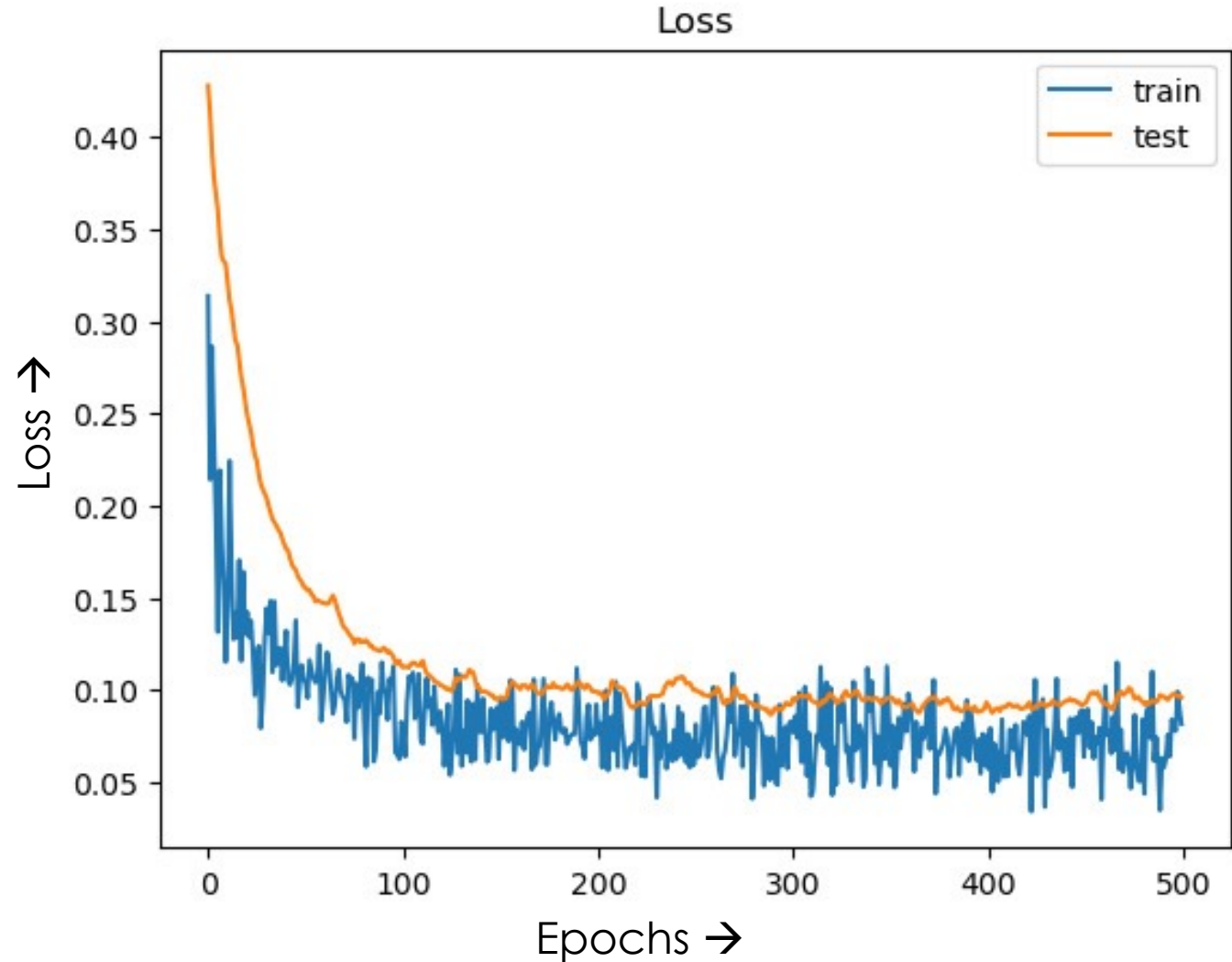
Sales prediction for the next 12 months(Using LSTM)





Evaluation

LSTM → Loss V/S Epoch



Model Evaluation

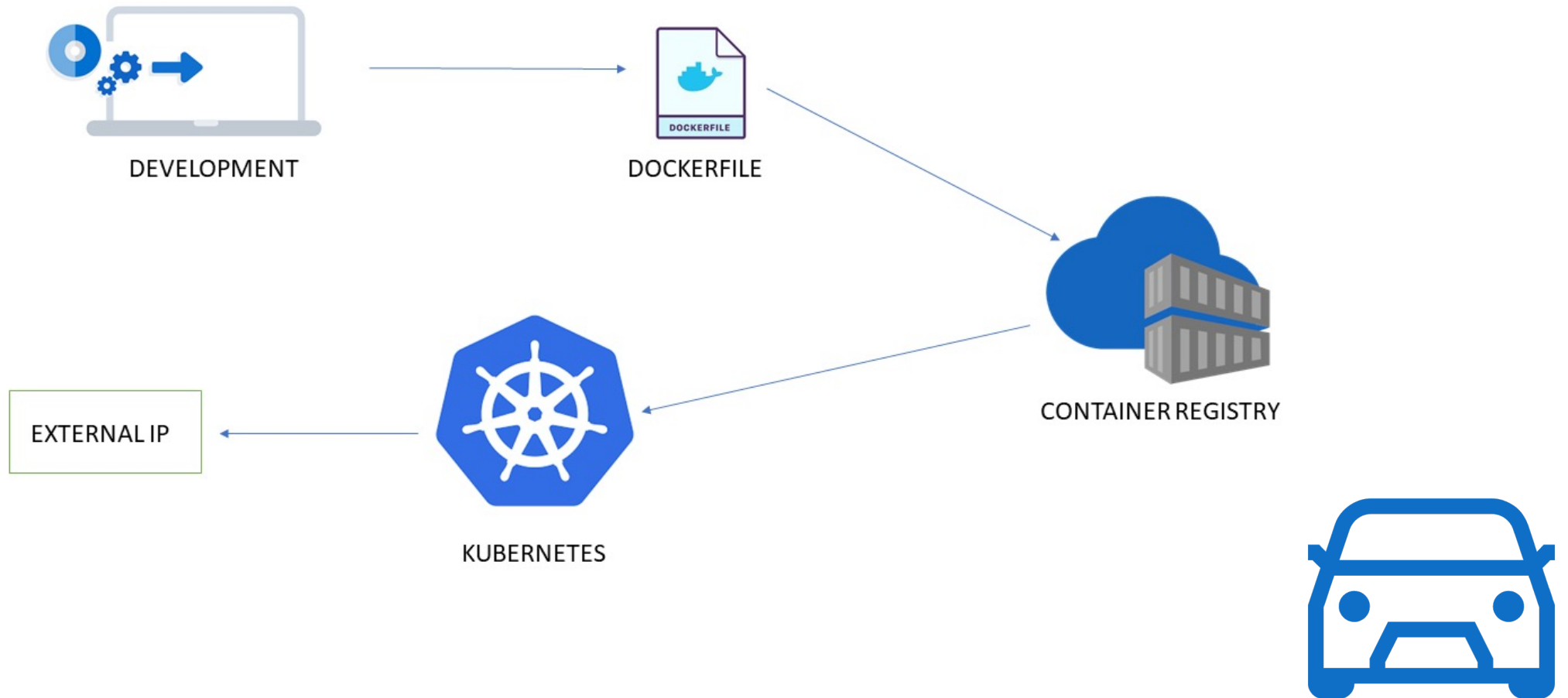
Model	RMSE
ARIMA	88.598
LSTM	75.877

Model	MAE	Accuracy
ARIMA	71.83469	28.16530
LSTM	13.97915	86.02084

The image features a large blue semi-circle on the left side, containing the word "Deployment" in white. The background is white and decorated with various geometric elements: a green circle in the top left, a green circle in the top right, a green dashed line in the top right, a green dashed line in the bottom right, and a green square outline in the bottom right.

Deployment

Deployment strategy



Future Enhancements

- Customize according to the location
- Festivals, holidays, economy
- We can consider the ageing factor
- If modified correctly → can be modified to adapt any retail type of business
- Can be applied to real time streaming data.





Thank You