- Time Series

recall

Timestamp

Time Series analysis

Time Series forecasting

Machine learning

- 1) Data
2) EDA
3) Processing
4) model
5) evaluation

Expand → Project

→ Big data / databases
→ deployment
→ CI/CD

(Seasonality, trend, cycle, error)

① Data — univariate, multivariate

② analysis on time series → Stationary (mean, var)

③ Processing → Non-stat → (Stat)

④ model

⑤ evaluation / Loss (MSE)

AIC, BIC

(Prob)

(Facebook) Prophet

Classical → Linear Reg

AIC

ARIMA — p, d, q

ARMA

SARIMA

SARIMAX

(AR) → p

(I) → d

(MA) → d

ACF, PACF

RNN
LSTM
transform

temporal fusion transformer

Google (TFT)

N-Beats
(deep AR)

= (XGBoost), (RNN) — timestamp

(Previous) — Next info

time related

- Stock
- Bitcoin / crypto
- Weather
- Sales

→ (Interval)

1.

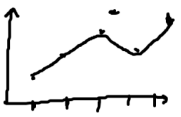
(NSE)

1 year
24 hr

= 10 AM, 11 AM, 12 PM, 1 PM, 2 PM, 3 PM

500, 550, 500, 570, 620, ?

(very few)



Analysis → (decompose)

- Seasonality
- trend
- cycle
- Noise

(ACF)

Correlation

Product

(Similarity)

(relation)

+ve

Weight

?? (Regression)

y = mx + c

y = mx + c

AR — p

I — D

MA — q

1 → MA

1	MA
2	2
3	3
4	4
5	5

lag = 1

Correlation

ACF

AR

ACF or Correlogram

(Correlation)

Weight

Autocorrelation.

Original data

lag = 1

AR I MA

ARIMA

Y = AR + I + MA

Autocorr

AR — Auto reg.

AR

Auto corr → Auto reg

I → difference

lag = 1

best corel

f1

f1

(Regression)(1)

Heat wave

(Day 4)(temp)

(40 42 45 48 50)

2 3 3 2

Summer data

Y!H

Difference

Pattern

we are not able to find out any Pattern

Monthly

Sales

25 30 40 35

Practical

Data

Analysis

Preprocessing

ACF, PACF

Model - (ARIMA) - ARMA

Linear regression (Mathematical)

evaluation - (AIC) = lowest
(BIC)