



Machine Learning

# Time Series Forecasting

Looking at data overtime to forecast or predict future values based on patterns or recurring trends.

examples

- weather forecast
- Holiday season sales
- Stock market
- online user traffic

I am predictable

## Data Characteristics:

- Seasonality
- Outliers
- long-run cycle
- Constant variance
- abrupt changes



Statmodels

Define model w/ SARIMAX()

## Using ARIMA

Auto regressive  
 "lags"  
 previous values in your data  
 "long memory models"

moving average  
 integrated  
 Stationarity

previous hidden shocks or errors in your model  
 "short memory models"



$\Delta$  diff  
 Differencing: look at the  $\Delta$  from one period to another