

Forex Prediction

**Using Deep Learning to
forecast the daily closing
price of USDAUD**

Presented by

**Wan Yew Cheong
Phua Cheng How
Victor Tan Wee Chin
Jane Wong Wai Kiuan
Ben Soh Sai Chong**



Introduction

Trading Currencies In Pairs



EURO



YE PY



GBPUSD



AUDUSD



USDCHF



USDCAD



NZDUSD

Business



Business Opportunity

We will provide currency prediction with an accuracy of 80% to help individual traders in their Forex trading.

In the simplest term anyone unfamiliar with our industry would understand is, if the actual price of USDAUD is \$1, our predicted price is within the range of plus/minus 20%.

Our user is a 30 years old part-time day trader, who has 2 years experience in Forex trading.

This user struggles because he has low accuracy of predicting the currency movement using his own method, which is both time consuming and frustrating.

This would be great for our company because we could sell our forex forecasting services to retail traders.

Persona



Tony Tan

- Part-time Day Trader
- 2 years of Forex trading experience
- Works as an agent in Insurance company
- 30 years old
- Studied in Australia
- Single
- Stays with his parents
- Owns a car

Characteristics

Motivated, decisive

Concerns

How to make better prediction
of the forex market

Wants

Make more money
Early retirement

Empathy Map

Says

So upset when I was late to find out that my prediction was totally wrong

I wouldn't mind paying for this tool if it charges a small fee

How I wish if there was a tool I could use to give some information to my trading

It's so time consuming just to analyze the market

Is this the perfect timing to buy or sell?

What if I lost my profit today?

How to increase my number of profitable trades confidently?

What will be the external factors affecting the price today?

Does

Searching for some trustworthy tips from friends and peers

Referring to the World Environment Analyst that can affect the close price

Analyses the Forex Price fluctuation from the Yahoo Finance website

Closely monitoring in one currency pair: USDAUD from FRED

Feels

Not sure which one is a good win and not to be over risked

Indecisive and anxious

Search is extremely cumbersome

Got so stressed up especially when trades tank



Tony Tan

MVP Statement

If we provide: **day trader**

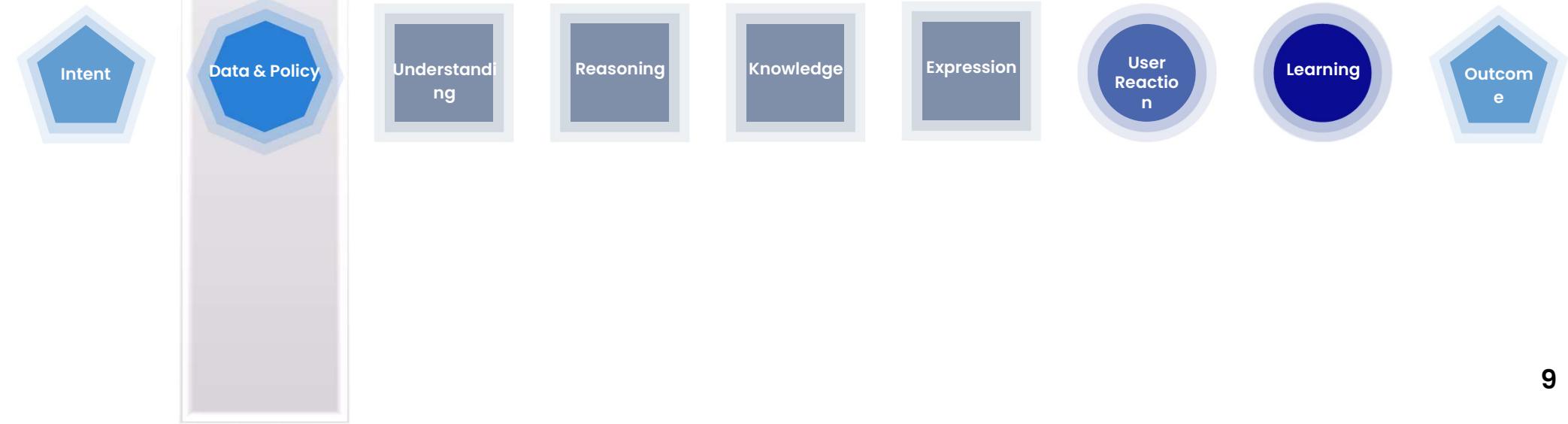
With: **a USDAUD price forecast tool to enhance his/her decision to execute his/her trades**

We will address the risk of: **predicting the wrong direction of the currency pair**

By measuring: **the accuracy percentage of our forecast**

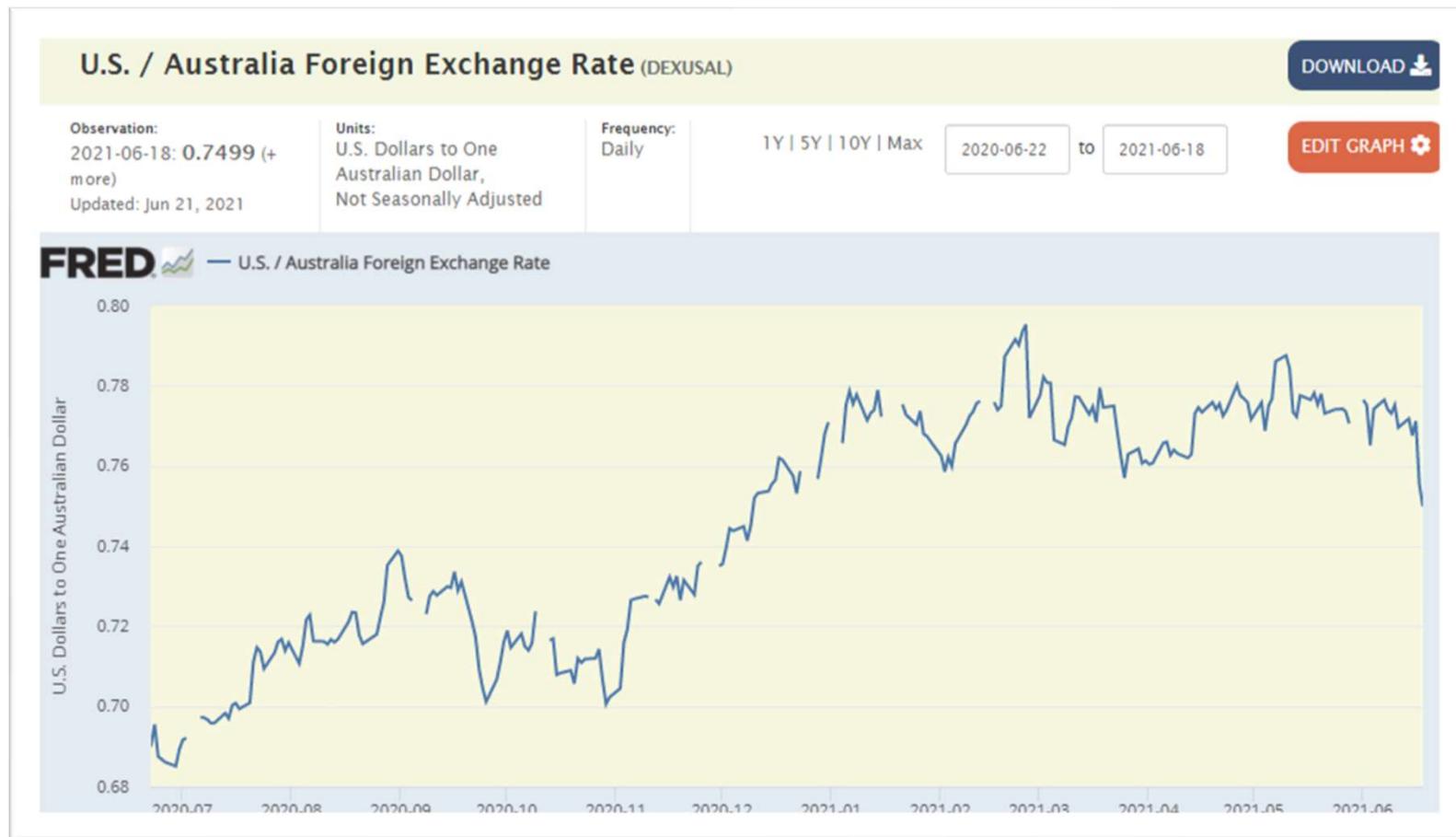
We'll know we've arrived when we observe: **The accuracy is over 80%.**

WORLD



About Dataset

- Federal Reserve Economic Data | FRED | St.Louis Fed
<https://fred.stlouisfed.org>



- **Yahoo! Finance**

<https://finance.yahoo.com/currencies>

To credit mention Yahoo Finance

yahoo!
finance

Search for news, symbols or companies

Sign in

Mail

Finance Home Watchlists My Portfolio Screeners Markets News Personal Finance ...

Cryptocurrencies Calendars Trending Tickers Stocks: Most Actives Stocks: Gainers Stocks: Losers Top ETFs Futures World Indices

Symbol	Pair	Current	Change	Percent Change	Volume	Open	Close
ETHUSD=X		N/A	N/A	N/A	0.00	0.00	
EURUSD=X	EUR/USD	1.1855	-0.0010	-0.08%	1.12	1.24	
JPY=X	USD/JPY	111.5400	+0.4570	+0.41%	102.59	111.55	
GBPUSD=X	GBP/USD	1.3775	-0.0050	-0.36%	1.24	1.42	
AUDUSD=X	AUD/USD	0.7486	-0.0017	-0.22%	0.69	0.82	
NZDUSD=X	NZD/USD	0.6985	-0.0010	-0.14%	0.65	0.75	
EURJPY=X	EUR/JPY	132.1890	+0.4790	+0.36%	120.26	134.13	
GBPJPY=X	GBP/JPY	153.6200	+0.0100	+0.01%	133.10	156.04	
EURGBP=X	EUR/GBP	0.8602	+0.0031	+0.36%	0.84	0.93	
EURCAD=X	EUR/CAD	1.4705	+0.0009	+0.06%	1.46	1.60	
EURSEK=X	EUR/SEK	10.1685	+0.0300	+0.30%	9.07	10.66	

World Data & Policy

Our Data Policy based on Personal Data Protection Act (PDPA)

1. Notify Purposes and Seek Consent
2. Collect minimum data & dispose data when no longer needed
3. Ensure data accuracy and allow correction
4. Secure the data held by our company
5. Communicate our Data Protection Policies

THE STRAITS TIMES

SINGAPORE

Singapore firms fined \$75,000 for personal data lapses affecting over 600,000 people



Kenny Chee
Senior Tech Correspondent

UPDATED JUN 14, 2021 11:39 PM

f t ...

today

Companies face much higher financial penalties for personal data breaches



By JUSTIN ONG

Published OCTOBER 05, 2020

Updated OCTOBER 06, 2020

30 SHARES

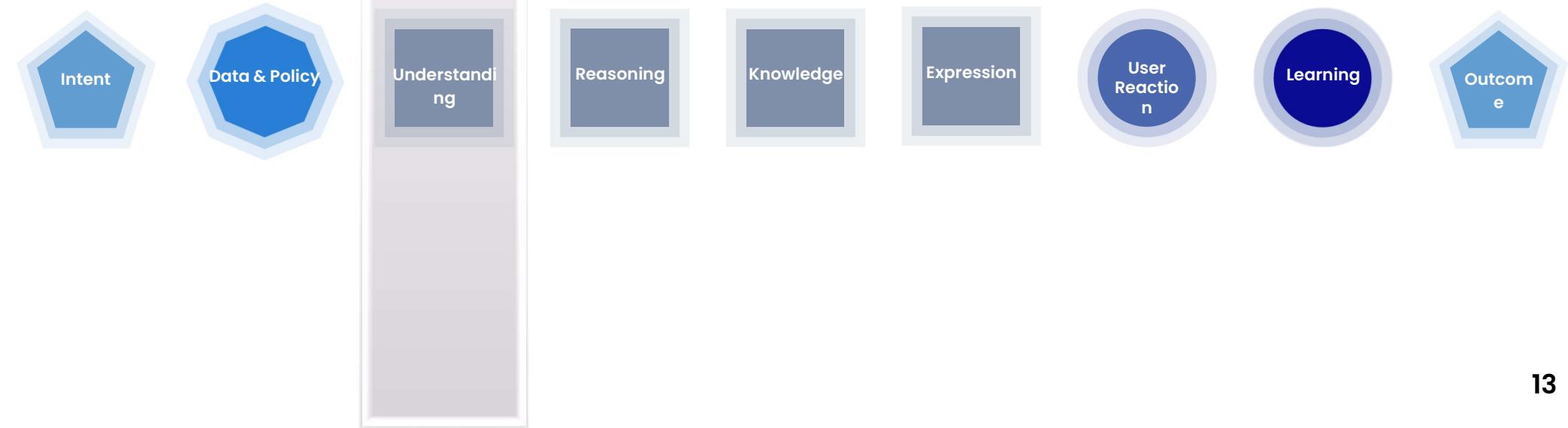
THE BUSINESS TIMES

Proposed changes to Singapore's data protection law seek stiffer penalties for info leaks

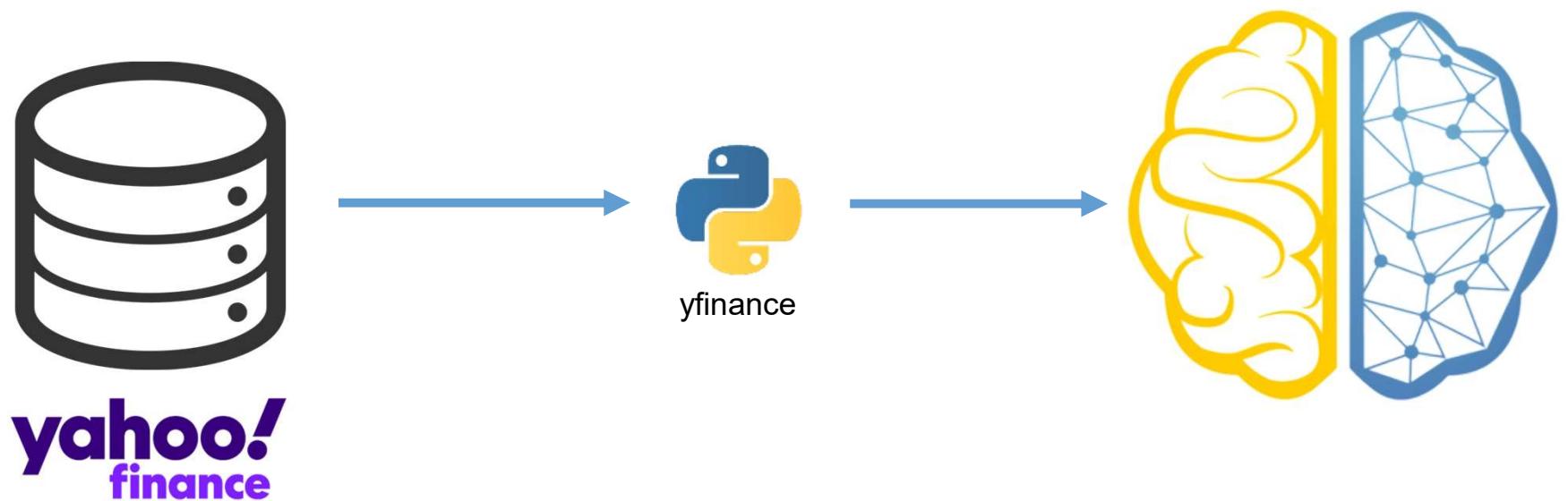
THU, MAY 14, 2020 - 4:49 PM

12

Machine

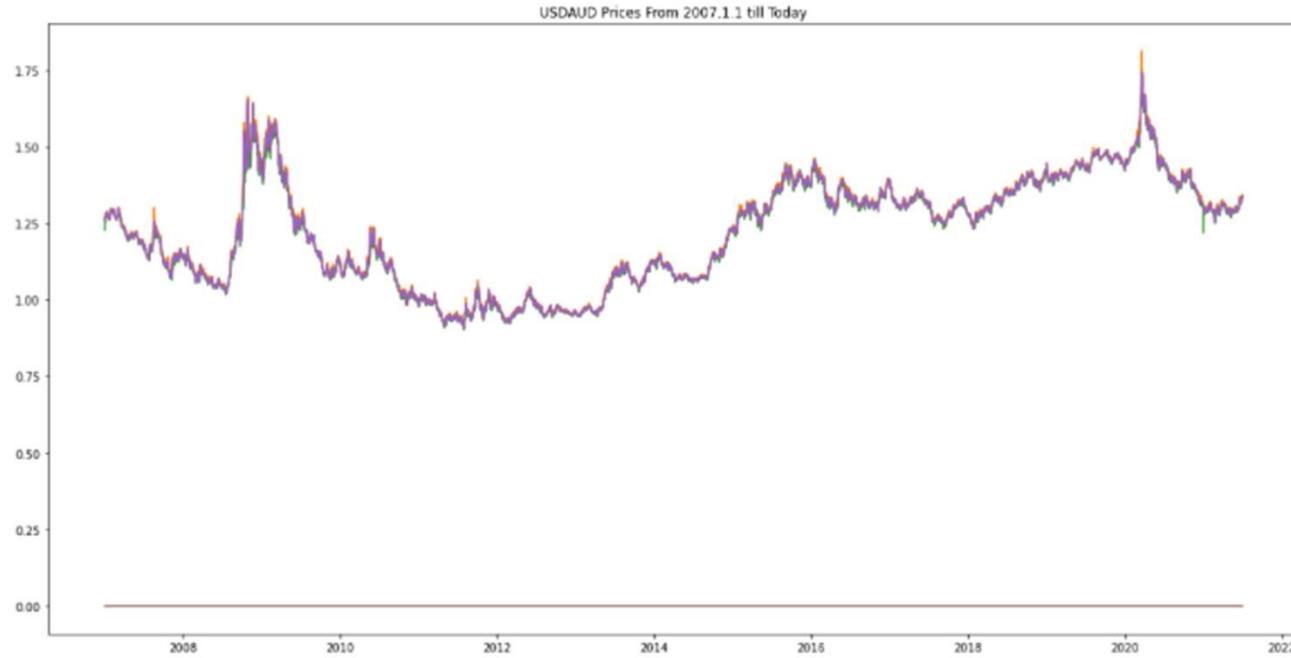


Data Source Feed



```
In [3]: # Define variable for current date, start and end time  
# end = current_date  
current_date = date.today()  
start = date(2007, 1, 1)  
end = current_date  
  
# data obtained from Yahoo Financials  
USDAUD = yf.download('AUD=X', start, end)  
plt.figure(figsize=(20, 10))  
plt.plot(USDAUD)  
plt.title('USDAUD Prices From 2007.1.1 till Today')  
[*****100%*****] 1 of 1 completed
```

```
out[3]: Text(0.5, 1.0, 'USDAUD Prices From 2007.1.1 till Today')
```



```
In [4]: USDAUD.tail()
```

```
Out[4]:
```

Date	Open	High	Low	Close	Adj Close	Volume
2021-06-28	1.316656	1.323469	1.315097	1.316656	1.316656	0
2021-06-29	1.321266	1.331820	1.320800	1.321283	1.321283	0
2021-06-30	1.330831	1.334610	1.328198	1.330920	1.330920	0
2021-07-01	1.334169	1.339764	1.331558	1.333742	1.333742	0
2021-07-02	1.339208	1.342410	1.333156	1.339440	1.339440	0

```
In [6]: USDAUD.describe()
```

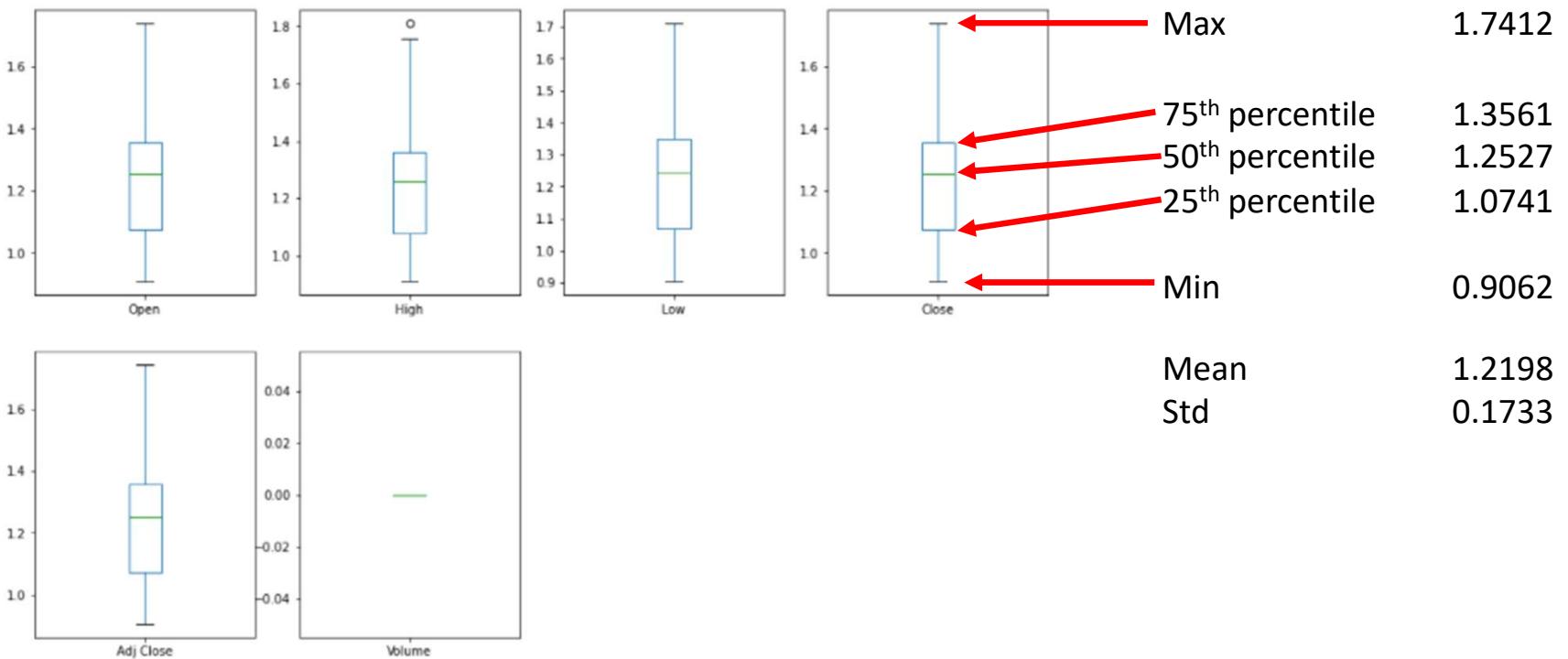
```
Out[6]:
```

	Open	High	Low	Close	Adj Close	Volume
count	3753.000000	3753.000000	3753.000000	3753.000000	3753.000000	3753.0
mean	1.219855	1.226103	1.213717	1.219835	1.219835	0.0
std	0.173255	0.175007	0.171594	0.173283	0.173283	0.0
min	0.906210	0.908840	0.902480	0.906210	0.906210	0.0
25%	1.074200	1.078300	1.070100	1.074100	1.074100	0.0
50%	1.252850	1.261300	1.243800	1.252700	1.252700	0.0
75%	1.356200	1.362100	1.350100	1.356100	1.356100	0.0
max	1.740220	1.811594	1.712270	1.741280	1.741280	0.0

```
In [5]: USDAUD.info()
```

```
<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 3753 entries, 2007-01-01 to 2021-07-02
Data columns (total 6 columns):
 #   Column      Non-Null Count  Dtype  
--- 
 0   Open         3753 non-null   float64
 1   High        3753 non-null   float64
 2   Low          3753 non-null   float64
 3   Close        3753 non-null   float64
 4   Adj Close    3753 non-null   float64
 5   Volume       3753 non-null   int64  
dtypes: float64(5), int64(1)
memory usage: 205.2 KB
```

```
In [7]: USDAUD.plot(kind='box', subplots=True, layout=(4,4), sharex=False, sharey=False, figsize=(15,20))
pyplot.show()
```



PROPHET

Prophet follows the `sklearn` model API. We create an instance of the `Prophet` class and then call its `fit` and `predict` methods.

The input to Prophet is always a dataframe with two columns: `ds` and `y`. The `ds` (datestamp) column should be of a format expected by Pandas, ideally YYYY-MM-DD for a date or YYYY-MM-DD HH:MM:SS for a timestamp. The `y` column must be numeric, and represents the measurement we wish to forecast.

```
In [6]: USDAUD.describe()
```

```
Out[6]:
```

	Open	High	Low	Close	Adj Close	Volume
count	3753.000000	3753.000000	3753.000000	3753.000000	3753.000000	3753.0
mean	1.219855	1.226103	1.213717	1.219835	1.219835	0.0
std	0.173255	0.175007	0.171594	0.173283	0.173283	0.0
min	0.906210	0.908640	0.902480	0.906210	0.906210	0.0
25%	1.074200	1.078300	1.070100	1.074100	1.074100	0.0
50%	1.262850	1.261300	1.243800	1.252700	1.252700	0.0
75%	1.356200	1.362100	1.350100	1.356100	1.356100	0.0
max	1.740220	1.811594	1.712270	1.741280	1.741280	0.0



```
In [8]: # For yahoo data - drop columns except close
```

```
USDAUD.drop(columns=['Open', 'High','Low','Adj Close','Volume'], axis=1, inplace=True)
```

```
USDAUD
```

```
Out[8]:
```

Date	Close
2007-01-01	1.264200
2007-01-02	1.256000
2007-01-03	1.262300
2007-01-04	1.276500
2007-01-05	1.281600
...	...
2021-06-23	1.323860
2021-06-24	1.320230
2021-06-25	1.318900
2021-06-28	1.318656
2021-06-29	1.321283

3750 rows × 1 columns

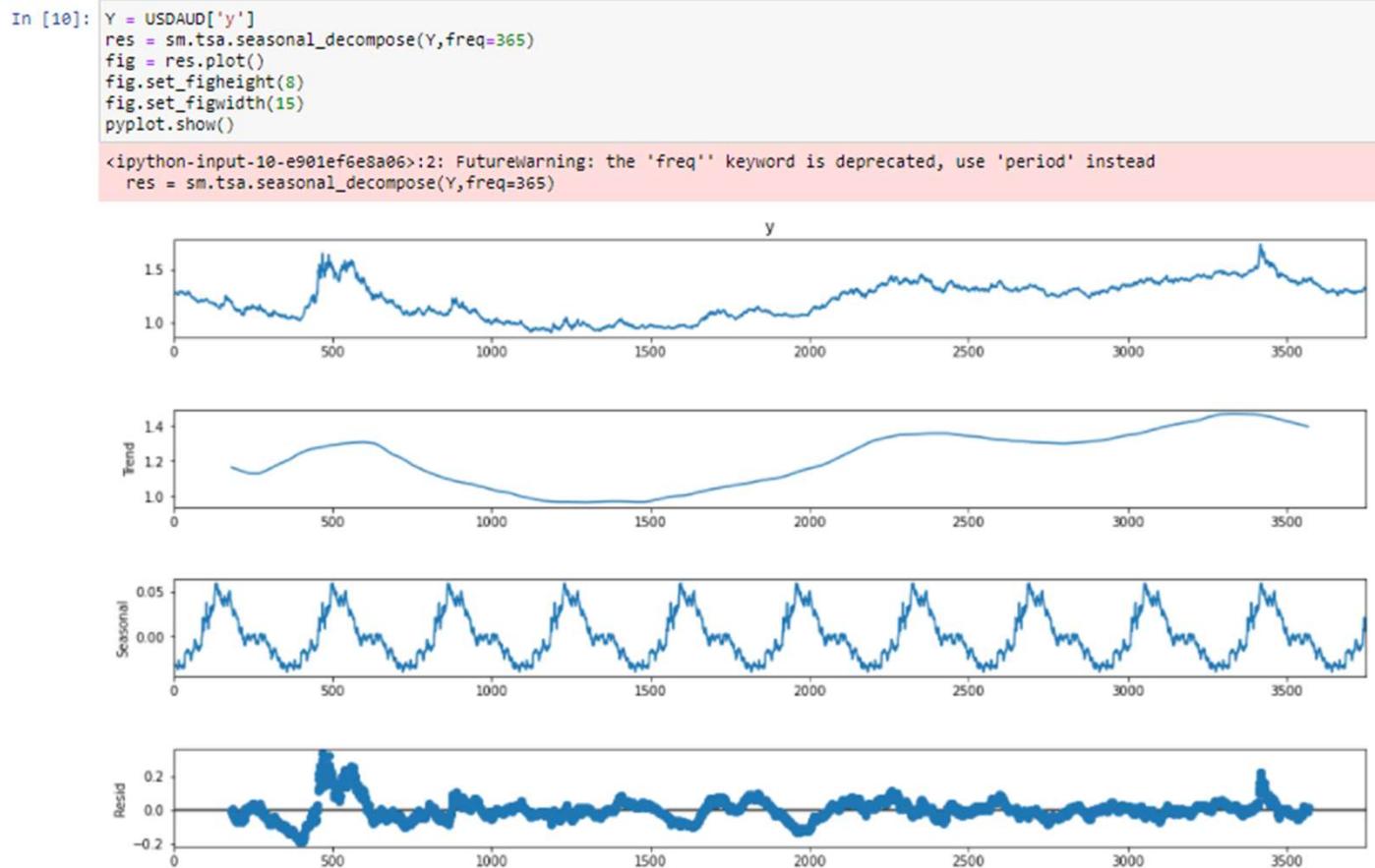
```
In [9]: # Renaming initial column names to 'ds'(date) &'y'(target variable)
```

```
USDAUD = USDAUD.reset_index().rename(columns={'Date': 'ds', 'Close': 'y'})
```

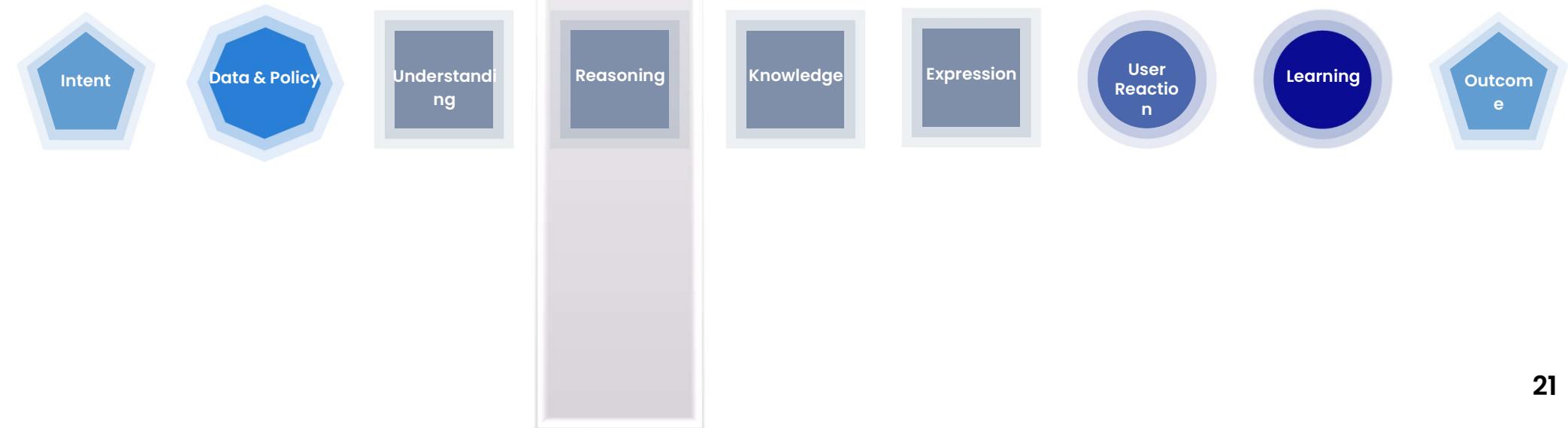
```
USDAUD.head()
```

```
Out[9]:
```

	ds	y
0	2007-01-01	1.2642
1	2007-01-02	1.2560
2	2007-01-03	1.2623
3	2007-01-04	1.2765
4	2007-01-05	1.2816

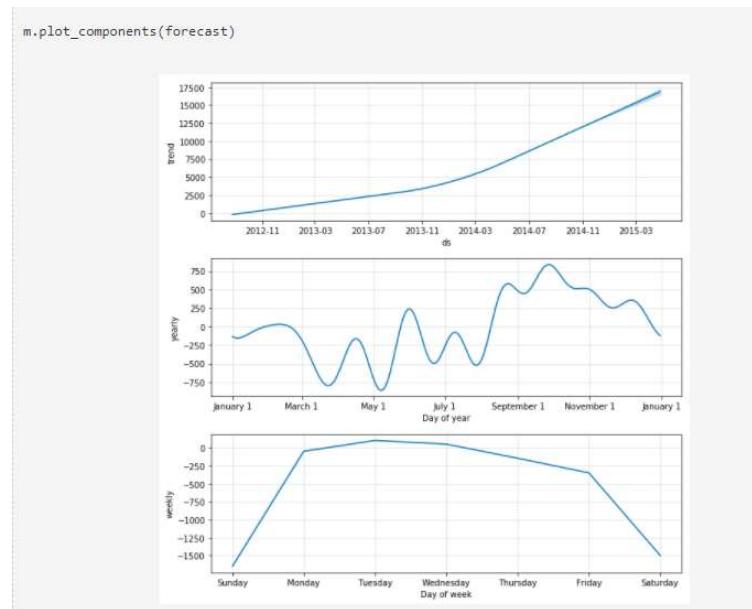


Machine



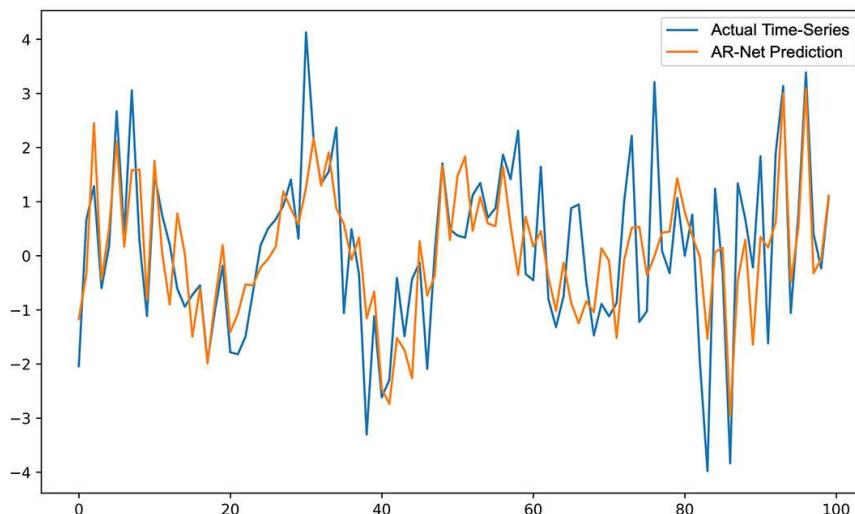


- Open source library
- based on decomposable (trend+seasonality+holidays) models.
- make time series predictions with good accuracy using simple intuitive parameters
- support for including impact of custom seasonality and holidays!



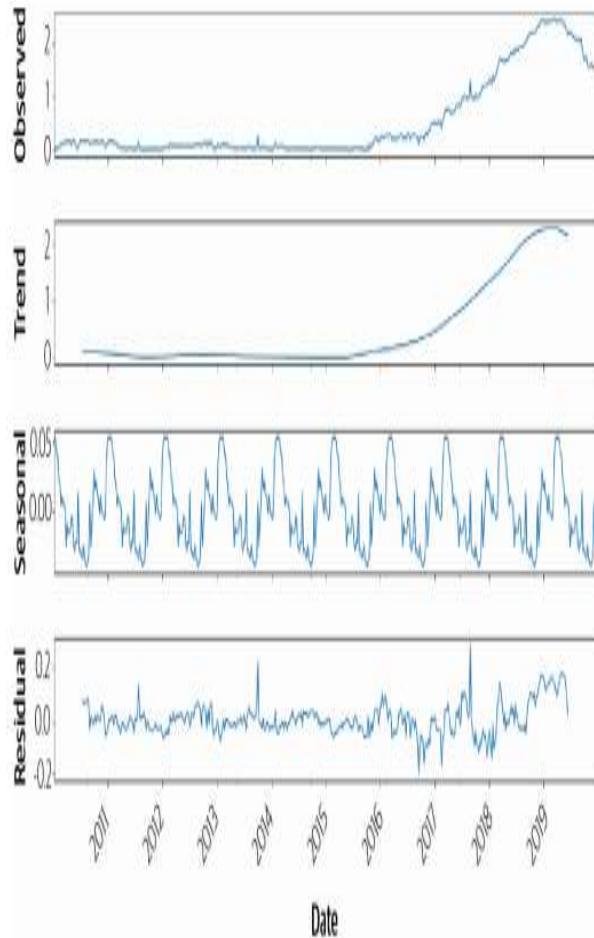


- Gradient Descent for optimisation via using PyTorch as the backend.
- Modelling autocorrelation of time series using AR-Net
- Modelling lagged regressors using a separate Feed-Forward Neural Network.
- Configurable non-linear deep layers of the FFNNs.
- Tunable to specific forecast horizons (greater than 1).
- Custom losses and metrics.
- Due to the modularity of the code and the extensibility supported by PyTorch, any component trainable by gradient descent can be added as a module to NeuralProphet. Using PyTorch as the backend, makes the modelling process much faster compared to original Prophet which uses Stan as the backend.



PYTORCH

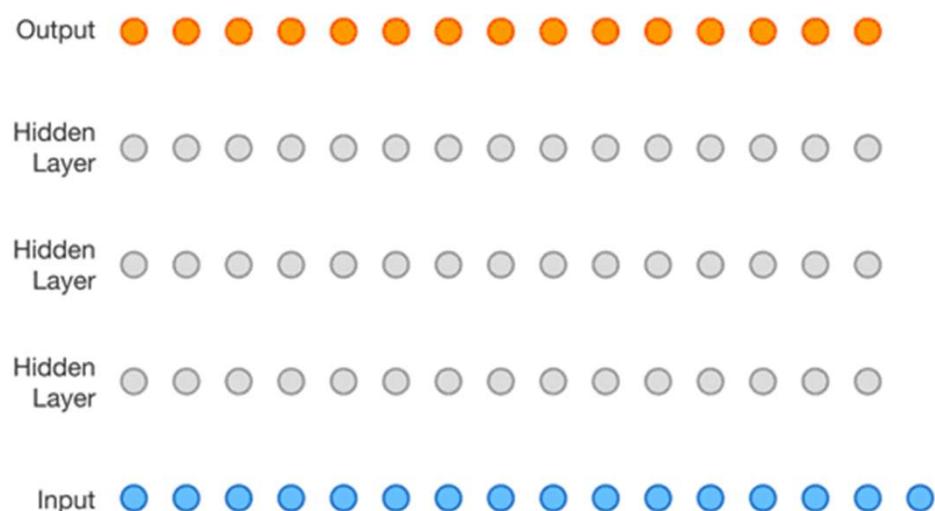
Time Series



- sequence of numbers that are ordered by a time index
- Components
 - Trend, Seasonality, Residuals
 - Stationarity
 - time series whose *statistical properties* do not change over time; mean, variance and autocorrelation structure of a given time series must remain constant.
 - Autocorrelation
 - correlation between the time series and a lagged version of itself
 - used to identify seasonality and trend in time series data.

Deep Learning for Time Series Forecasting

- Deep Learning for Time Series Forecasting overcomes the traditional Machine Learning disadvantages with many different approaches.
- Time series data can be highly erratic and complex.
- Deep Learning methods *make no assumption about the underlying pattern* in the data and are also more *robust to noise* (which is quite common in time series data), making them the top choice for time series analysis.





help(NeuralProphet)

Help on class NeuralProphet in module neuralprophet.forecaster:

```
class NeuralProphet(builtins.object)
    NeuralProphet(growth='linear', changepoints=None, n_changepoints=5, changepoints_range=0.8, trend_reg=0, trend_reg_threshold=False, yearly_seasonality='auto', weekly_seasonality='auto', daily_seasonality='auto', seasonality_mode='additive')
        NeuralProphet forecaster.

    A simple yet powerful forecaster that models:
    Trend, seasonality, events, holidays, auto-regression, lagged covariates, and future-known regressors.
    Can be regularized and configured to model nonlinear relationships.

    Methods defined here:

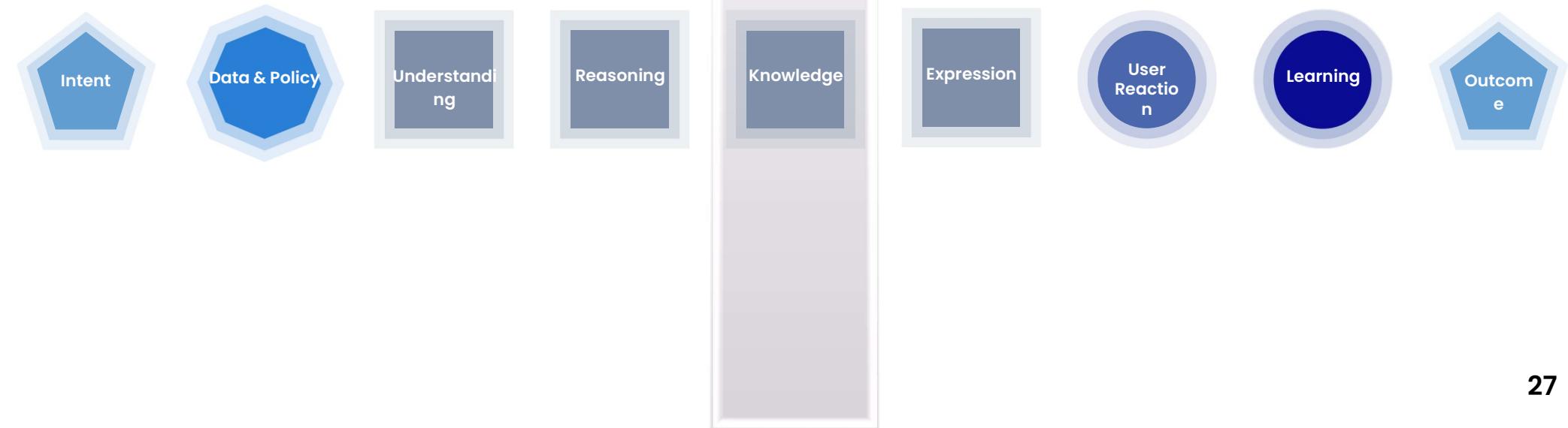
    __init__(self, growth='linear', changepoints=None, n_changepoints=5, changepoints_range=0.8, trend_reg=0, trend_reg_threshold=False, yearly_seasonality='auto', weekly_seasonality='auto', daily_seasonality='auto', seasonality_mode='additive')
        Args:
            ## Trend Config
            growth (str): 'off', 'discontinuous', 'linear' to specify
                no trend, a discontinuous linear or a linear trend.
            changepoints (np.array): List of dates at which to include potential changepoints. If
                not specified, potential changepoints are selected automatically.
            n_changepoints (int): Number of potential changepoints to include.
                Changepoints are selected uniformly from the first `changepoint_range` proportion of the history.
                Not used if input `changepoints` is supplied. If `changepoints` is not supplied.
            changepoints_range (float): Proportion of history in which trend changepoints will
                be estimated. Defaults to 0.8 for the first 80%. Not used if `changepoints` is specified.
            trend_reg (float): Parameter modulating the flexibility of the automatic changepoint selection.
                Large values (~1-100) will limit the variability of changepoints.
                Small values (~0.001-1.0) will allow changepoints to change faster.
                default: 0 will fully fit a trend to each segment.
            trend_reg_threshold (bool, float): Allowance for trend to change without regularization.
                True: Automatically set to a value that leads to a smooth trend.
                False: All changes in changepoints are regularized

            ## Seasonality Config
            yearly_seasonality (bool, int): Fit yearly seasonality.
                Can be 'auto', True, False, or a number of Fourier/linear terms to generate.
            weekly_seasonality (bool, int): Fit monthly seasonality.
                Can be 'auto', True, False, or a number of Fourier/linear terms to generate.
            daily_seasonality (bool, int): Fit daily seasonality.
                Can be 'auto', True, False, or a number of Fourier/linear terms to generate.
            seasonality_mode (str): 'additive' (default) or 'multiplicative'.
            seasonality_reg (float): Parameter modulating the strength of the seasonality model.
                Smaller values (~0.1-1) allow the model to fit larger seasonal fluctuations,
                larger values (~1-100) dampen the seasonality.
                default: None, no regularization

            ## AR Config
            n_lags (int): Previous time series steps to include in auto-regression. Aka AR-order
```

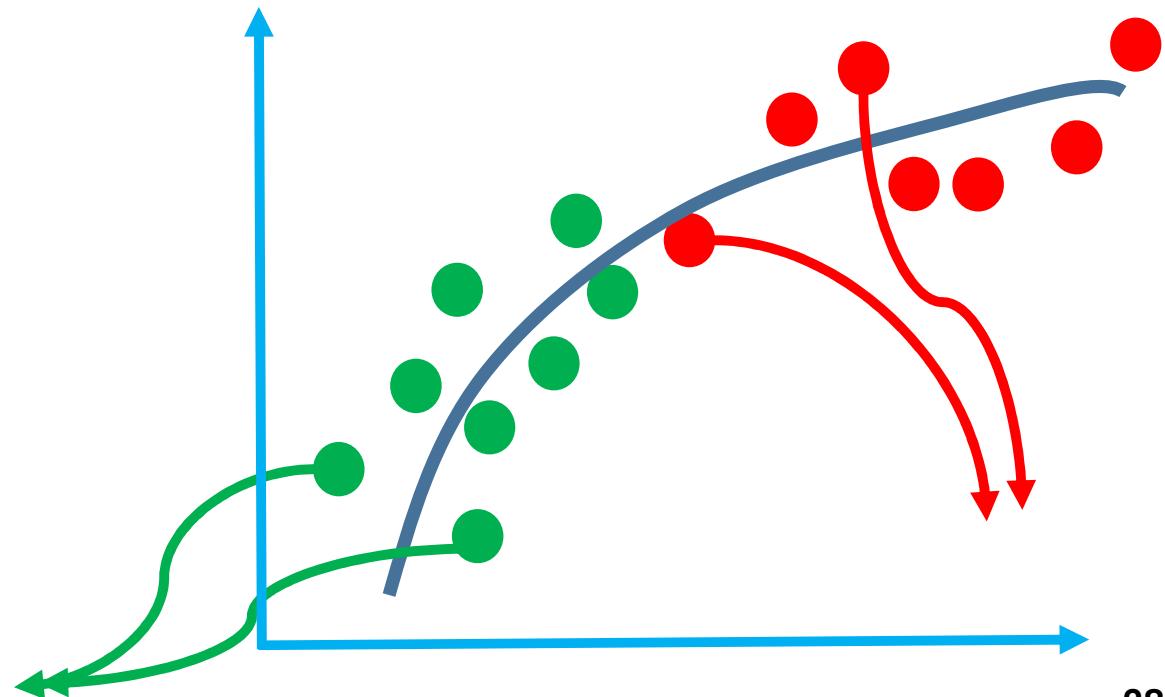
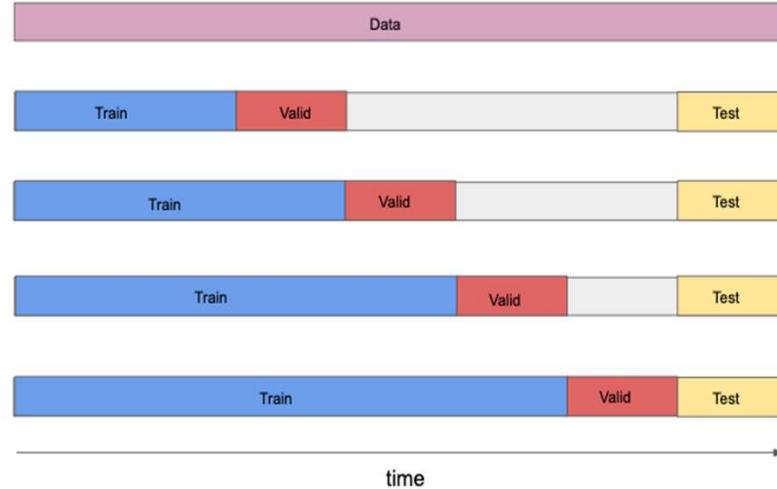


Machine



TRAINING VS. TESTING DATASETS

- Dataset is divided to training and testing datasets
- Testing datasets have never been seen by the model before



TRAINING VS. TESTING VS PREDICTION DATASET

"History doesn't repeat itself but it often rhymes." Mark Twain

Training Dataset

9 years, 2814 records

From Jan 1, 2011 till Dec. 31 2019

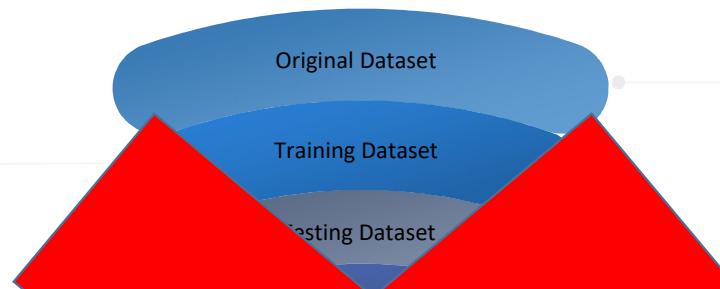
Prediction [

3.5 months, 89 reco

From Jan 1, 2021 til

```
# fit the model using all data
# model.fit(USDAUD, freq="D")

# with cross validation 20%, or train-test split 80-20
model.fit(USDAUD, freq='D', valid_p=0.2, epochs=100)
```



Original Dataset

13 years++, 4467 records

From Jan 1, 2007 till Apr. 15, 2021

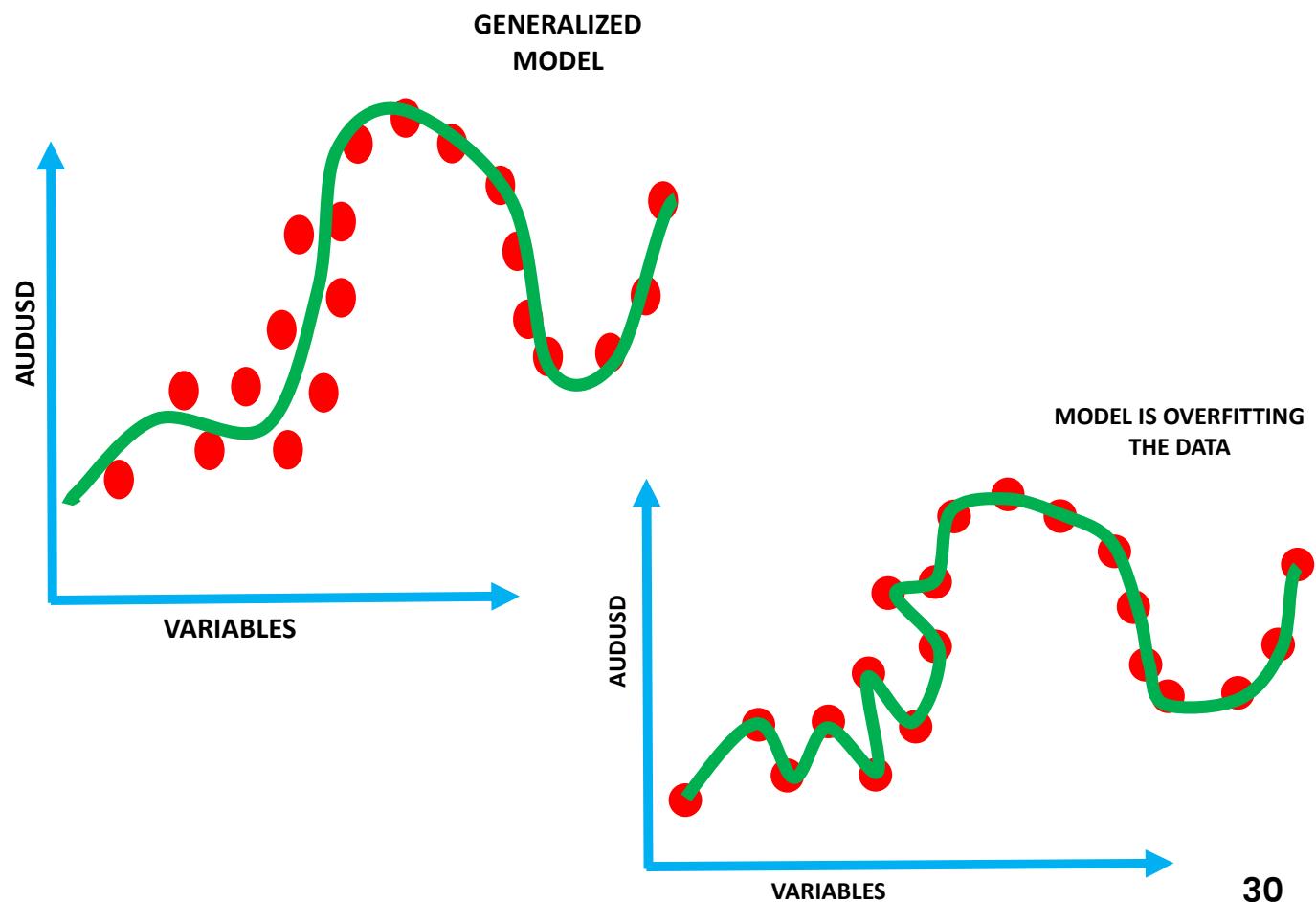
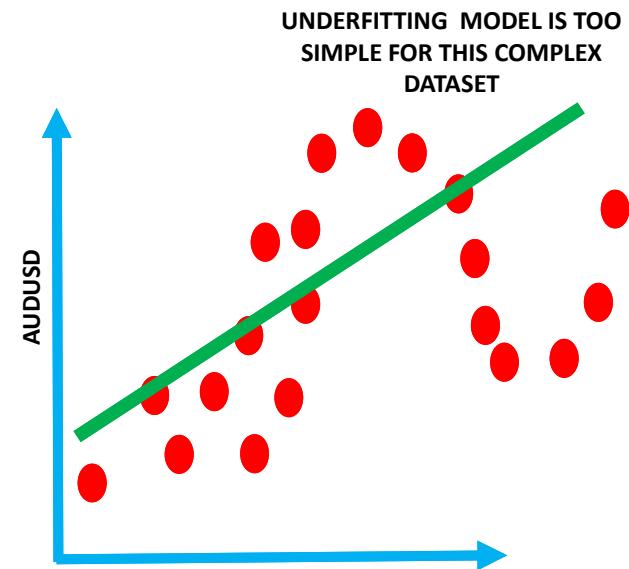
Testing Dataset

111 records

2020 till Dec. 31 2020



BEST MODEL



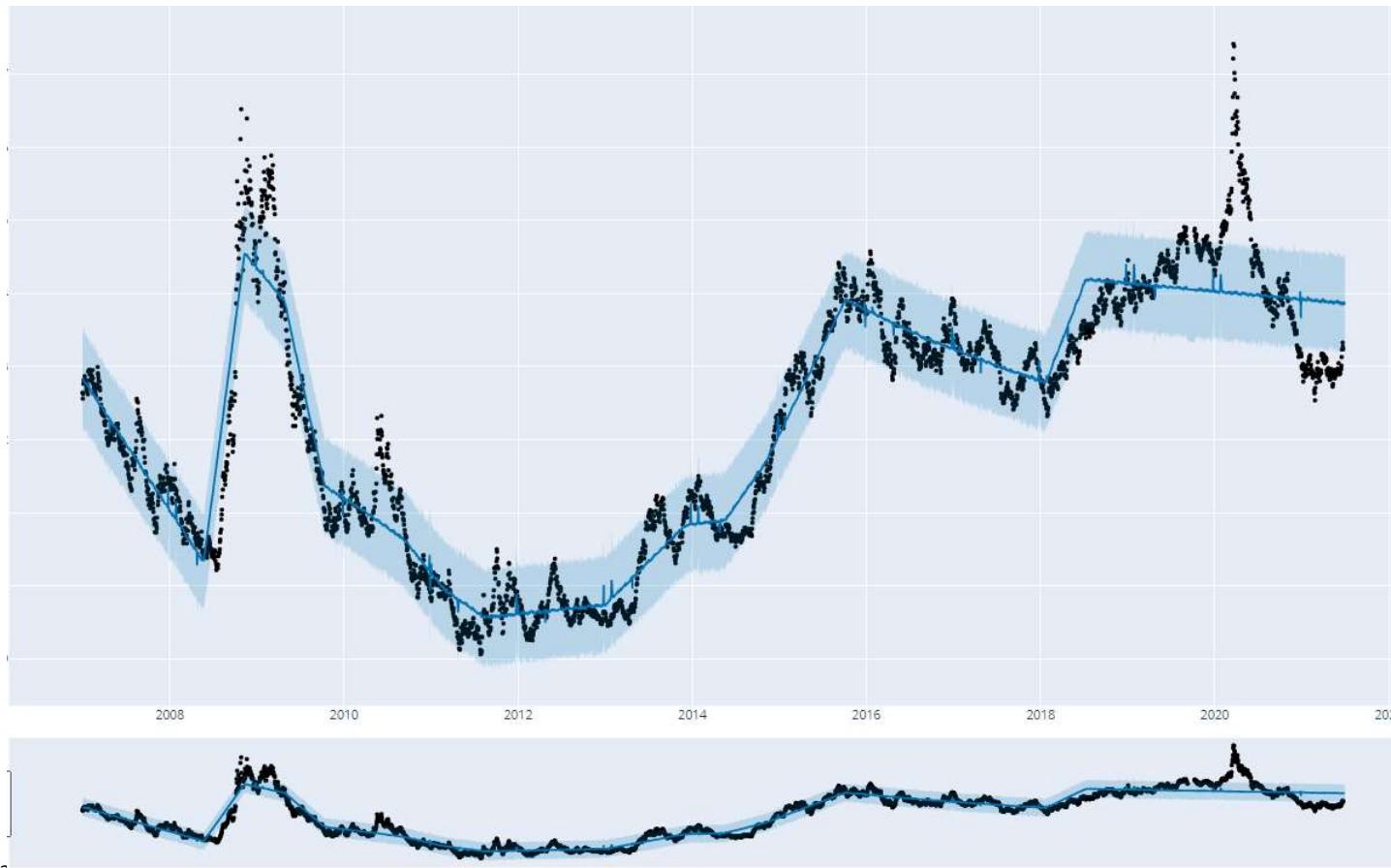
REGRESSION METRICS: MEAN ABSOLUTE ERROR (MAE)

- obtained by calculating the absolute difference between the model predictions and the true (actual) values
- MAE is a measure of the **average magnitude of error** generated by the regression model

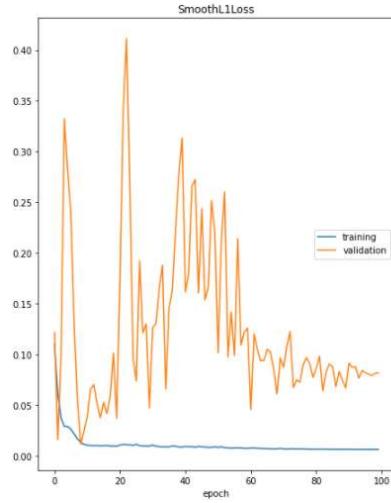




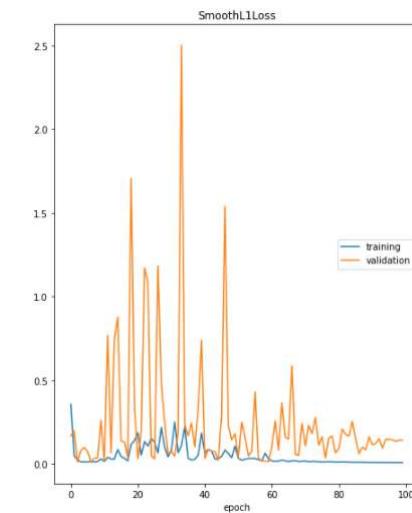
PROPHET



USDAUD prices
since 2007.1.1



Default



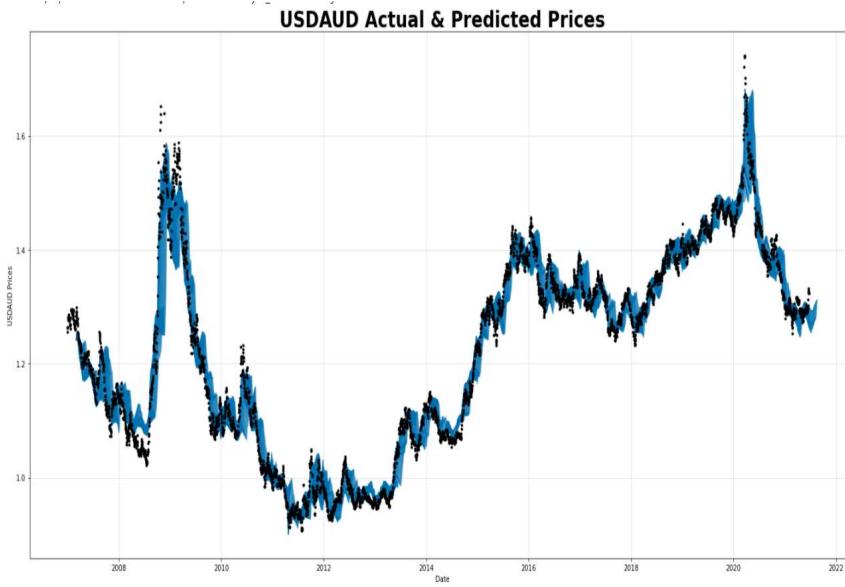
With
Seasonality

Machine Knowledge

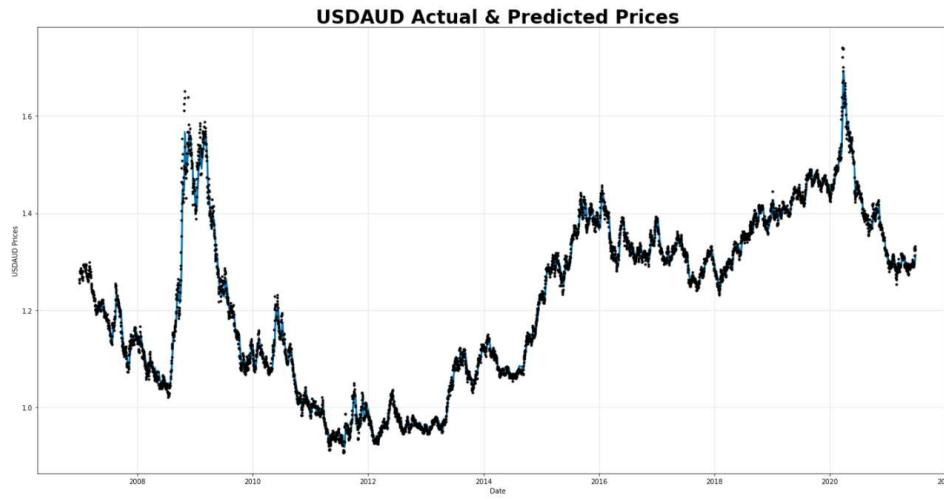


	SmoothL1Loss	MAE	RegLoss
0	0.123921	0.231321	0.0
1	0.005139	0.049372	0.0
2	0.003080	0.036660	0.0
3	0.003218	0.038214	0.0
4	0.003453	0.040244	0.0
...
95	0.001843	0.027507	0.0
96	0.001833	0.027315	0.0
97	0.001820	0.027224	0.0
98	0.001805	0.027055	0.0
99	0.001801	0.026980	0.0

100 rows × 3 columns



With AR Net
n lag 100
n_forecast 7



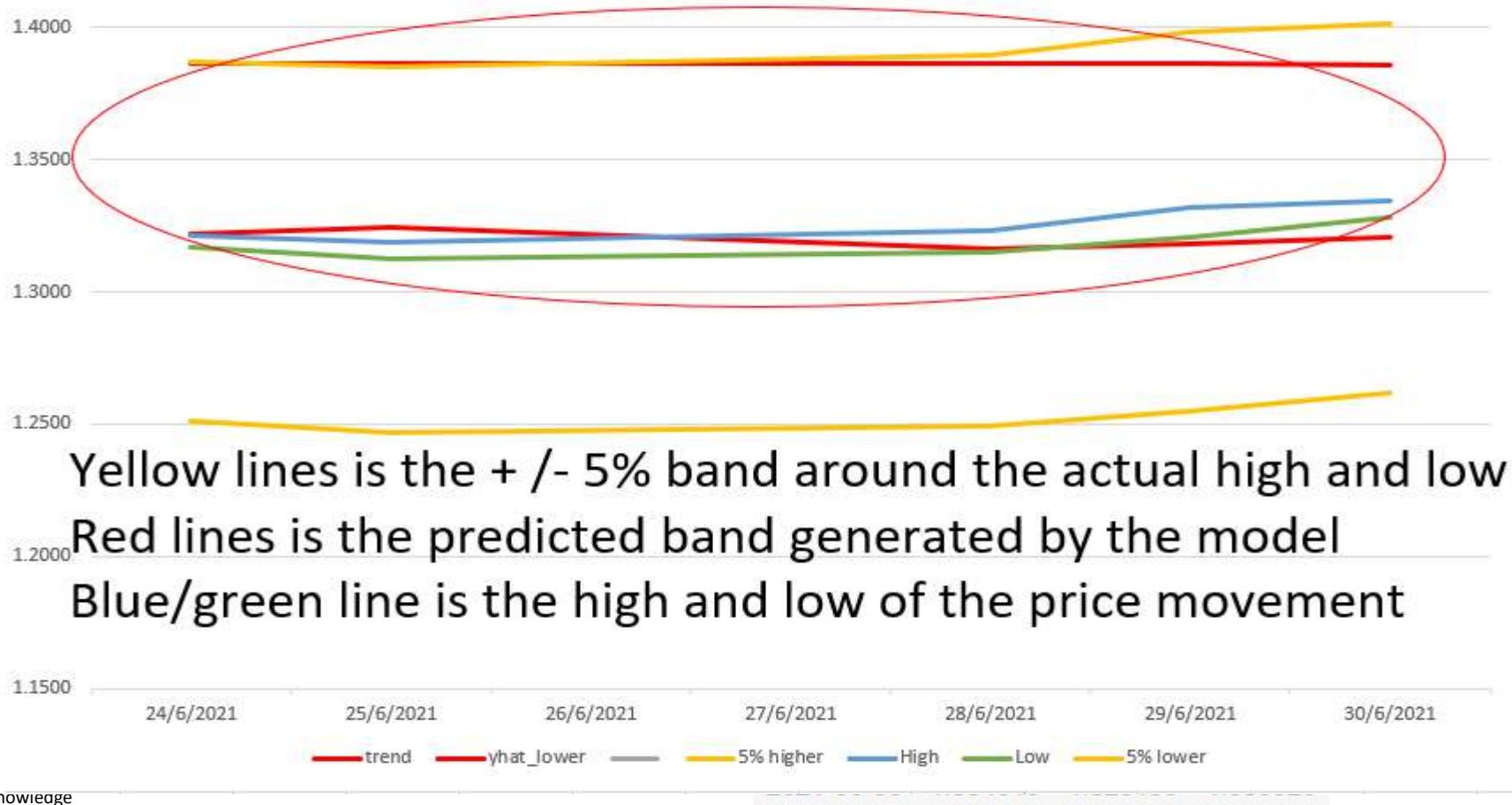
	SmoothL1Loss	MAE	RegLoss
0	0.151510	0.257537	0.0
1	0.003349	0.039867	0.0
2	0.001425	0.025894	0.0
3	0.001466	0.026547	0.0
4	0.001846	0.028795	0.0
...
95	0.000446	0.013372	0.0
96	0.000439	0.013190	0.0
97	0.000435	0.013044	0.0
98	0.000432	0.013000	0.0
99	0.000429	0.012908	0.0

100 rows × 3 columns

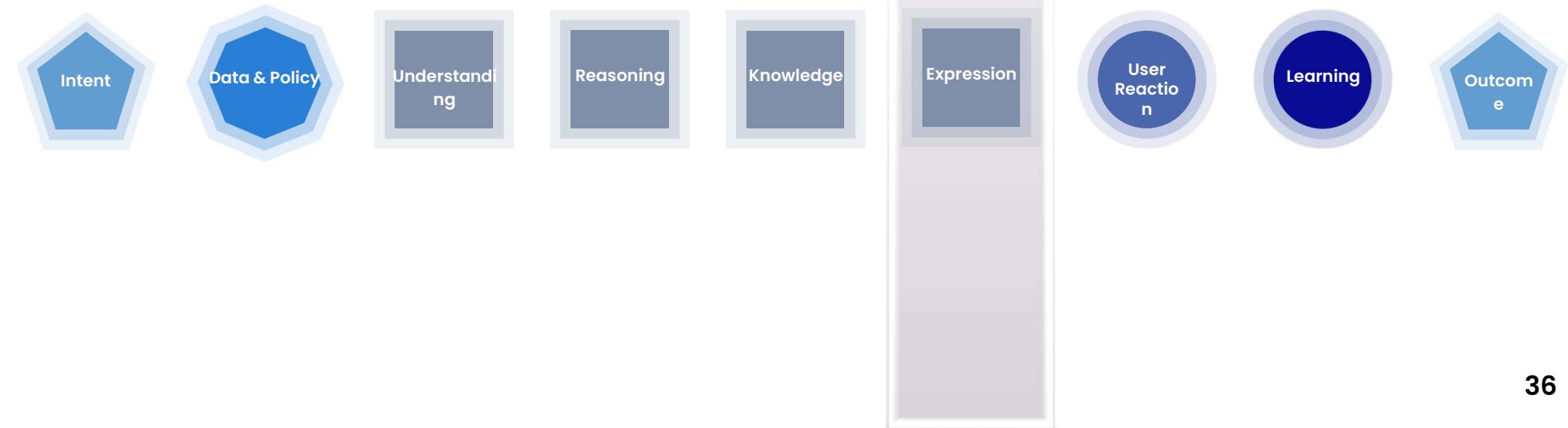


Actual daily price range of USDAUD (high/low) plotted against
model's predicted price range (trend/yhat_low)

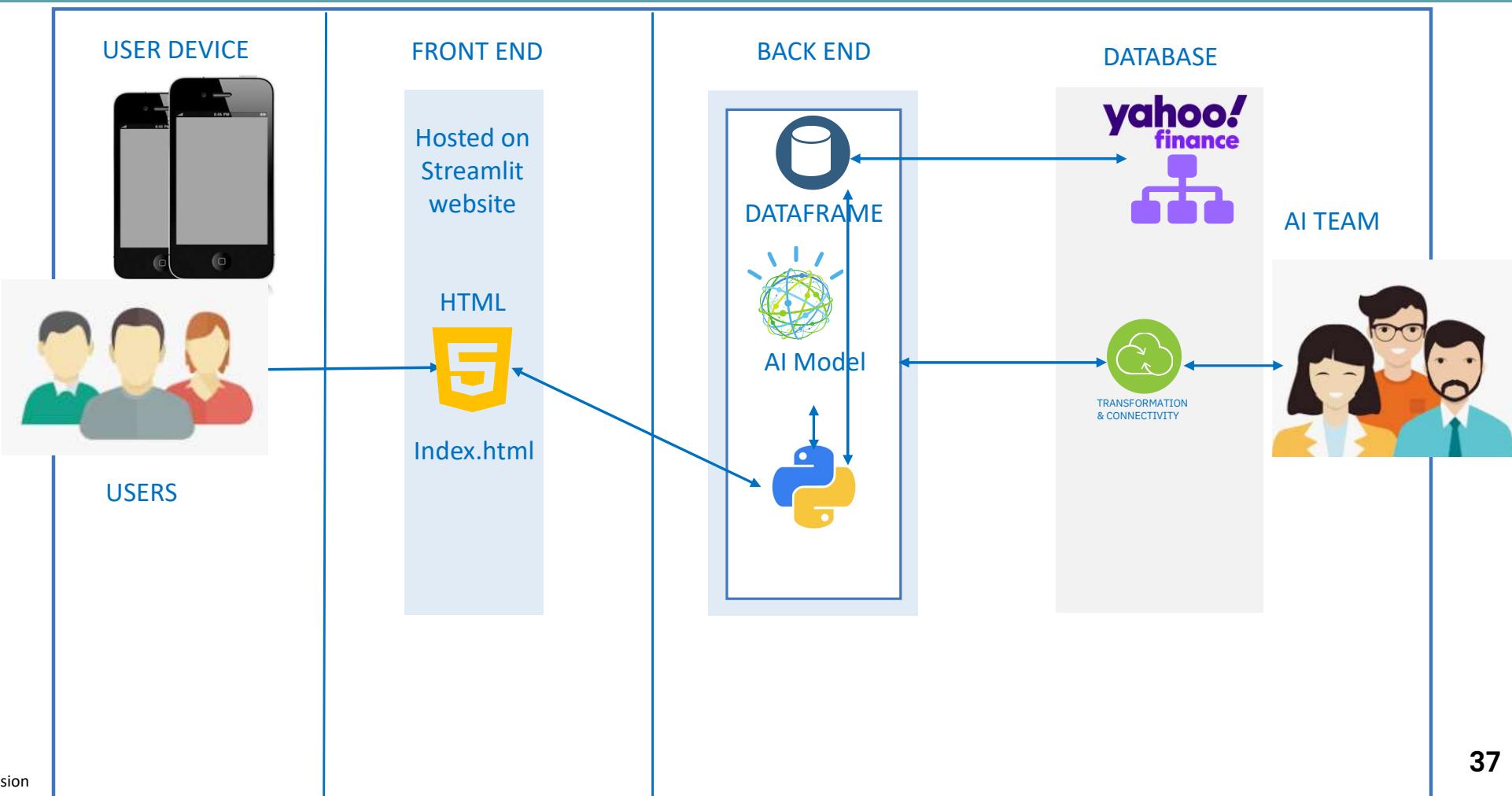
100% accuracy



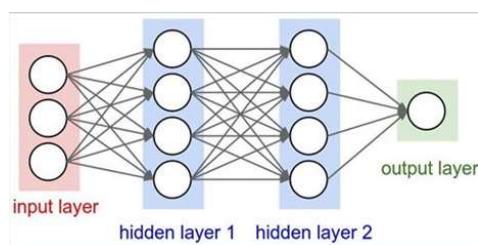
Machine



App Architecture – Flow diagram



What does it
mean,
**Model
Deployment?**





Portability – ability of the software to be transferred from one machine or system to another?

Scalability – how large the model can scale

Others factors and implications

- How frequently predictions should be generated?
- Urgency of the result?
- generated individually or by batches?
- The operational implications and costs?

Phase:

Model Deployment

End result:

User Interface via web app browser

Action plan:

to launch the app on **Streamlit**



Streamlit

The fastest way to
build and share
data apps

Streamlit turns data scripts into shareable web apps in minutes.
All in Python. All for free. No front-end experience required.

Sketch version:



FOREX:

USD-AUD

This is a web app to forecast the foreign exchange rates of Today, and maximum of the next 4 trading days. Please select the prediction day(s) in the "Select Forecast Horizon". Then, the Forecast Data will be prompted accordingly.

Select Forecast Horizon:

How many days would you like to forecast into the future? (max 7 days)

*Keep in mind that forecasts become less accurate with larger forecast horizons

- 1
- 2
- 3
- 4
- 5
- 6
- 7

Visualize Forecast Data

Today, 21 Jun 2021:

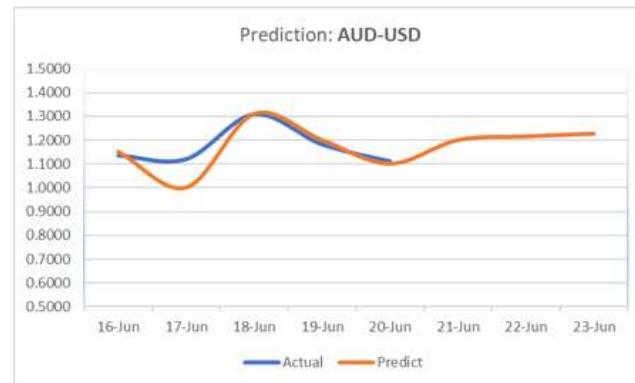
<date, autogenerated by AI>

Open Rate: **\$1.1000**

<autogenerated by AI, closing date of yesterday>

Forecast Close Rate: **\$1.2000**

Up (+) / Down (-): **+\$0.1000 (+9.09%)**



UI production environment

Welcome to USDAUD Forecaster

Step 1: Select Forecast Horizon

Keep in mind that forecasts become less accurate with larger forecast horizons.

How many days would you like to forecast into the future? (max 7 days)

1

- +

Step 3: Visualize Forecast Data

Forecast plot for 1 days

	ds	y	yhat1	residual1
0	2007-01-01T00:00:00+00...	1.2642	None	nan
1	2007-01-02T00:00:00+00...	1.2560	None	nan
2	2007-01-03T00:00:00+00...	1.2623	None	nan
3	2007-01-04T00:00:00+00...	1.2765	None	nan
4	2007-01-05T00:00:00+00...	1.2816	None	nan
5	2007-01-06T00:00:00+00...	1.2809	None	nan
6	2007-01-07T00:00:00+00...	1.2801	None	nan
7	2007-01-08T00:00:00+00...	1.2794	None	nan
8	2007-01-09T00:00:00+00...	1.2807	None	nan
9	2007-01-10T00:00:00+00...	1.2868	None	nan
10	2007-01-11T00:00:00+00...	1.2821	None	nan

AttributeError: 'NeuralProphet' object has no attribute 'history'

Traceback:

```
File "C:\Users\User\anaconda3\envs\streamlit_venv\lib\site-packages\streamlit\script
exec(code, module.__dict__)
File "C:\Users\User\Downloads\Forex-Forecasting-2-main\app-pch-v2.py", line 79, in <
fig1 = plot_plotly(model, forecast)
File "C:\Users\User\anaconda3\envs\streamlit_venv\lib\site-packages\fbprophet\plot.p
x=m.history['ds'],
```

- Status:
- **unable to launch the app successful**



WHY we can't launch the app successful?

What does the error
meant for?

Error from

Compatibility issue
with NeuralProphet?

Error from NeuralProphet

Lack of technical
knowledge,
experiences?

Experiences
knowledge

Time constraints

Time constraints



Sharing of our Streamlit experiences

Automated FOREX USD-AUD Forecasting

##upload Live Data directly from Yahoo Financials

NameError: name 'USDAUD1_data' is not defined

Traceback:

```
File "c:\users\jane\anaconda3\lib\site-packages\streamlit\script_runner.py", line 33
    exec(code, module.__dict__)
File "C:/Users/Jane/Downloads/Forex-forecast-main (2)/Forex-forecast-main/app.py", l
USDAUD1_data.read
```



Redefine the dataframe

```
start = datetime(2007, 1, 1)
end = current_date
USDAUD = yf.download('AUD=X', start, end)
df = pd.DataFrame(data=USDAUD)
dt
```

Welcome to USDAUD Forecaster

Step 1: Select Forecast Horizon

Keep in mind that forecasts become less accurate with larger forecast horizons.

How many days would you like to forecast into the future? (max 7 days)

5

RUNNING... Stop

How many periods would you like to forecast into the future?

1

Step 3: Visualize Forecast Data

The below visual shows future predicted values. "yhat" is the predicted value, and the upper and lower limits are (by default) 80% confidence intervals.

Forecast plot for 1 days

NameError: name 'forecast' is not defined

Traceback:

```
File "c:\users\jane\anaconda3\lib\site-packages\streamlit\script_runner.py", line 33
    exec(code, module.__dict__)
File "C:/Users/Jane/Downloads/Forex-forecast-main (2)/Forex-forecast-main/app.py", l
st.write(forecast)
```

Step 3: Visualize Forecast Data

The below visual shows future predicted values. "yhat" is the predicted value, and the upper and lower limits are (by default) 80% confidence intervals.



Import plotly, & related to display visual effect

```
from fbprophet import Prophet
from fbprophet.diagnostics import performance_metrics
from fbprophet.diagnostics import cross_validation
from fbprophet.plot import plot_cross_validation_metric
from fbprophet.plot import plot_plotly, plot_components_plotly
```



Redefine and revise the codes

```
future = model.make_future_dataframe(df2, periods=days, n_historic_predictions=len(df2))
forecast = model.predict(future)
model.plot(forecast)
```

Step 3: Visualize Forecast Data

The below visual shows future predicted values. "yhat" is the predicted value, and the upper and lower limits are (by default) 80% confidence intervals.

TypeError: make_future_dataframe() missing 1 required positional argument: 'df'

Traceback:

```
File "C:/Users/User/anaconda3/envs/streamlit_venv/lib/site-packages/streamlit\script
exec(code, module.__dict__)
File "C:/Users/User/Downloads/Forex-Forecasting-2-main/app-pch.py", line 66, in <mod
future = model.make_future_dataframe(periods=periods_input)
```



Prophet packages are downloaded in Streamlit when running the app

```
!manager Processing dependencies ...
Collecting fbprophet
  Downloading fbprophet-0.7.1.tar.gz (64 kB)
Collecting numpy==1.16.4
  Downloading numpy-1.16.4-cp37-cp37m-manylinux1_x86_64.whl (20.2 MB)
[client] Preparing system...
[client] Spinning up manager process...
Collecting streamlit
  Downloading streamlit-0.83.0-py2.py3-none-any.whl (7.7 MB)
Collecting pandas==1.0.3
  Downloading pandas-1.0.3-cp37-cp37m-manylinux1_x86_64.whl (10.0 MB)
Collecting pystan==2.19.1.1
  Downloading pystan-2.19.1.1-cp37-cp37m-manylinux1_x86_64.whl (67.3 MB)
Collecting neuralprophet
  Downloading neuralprophet-0.2.7-py3-none-any.whl (56 kB)
Collecting python-dateutil>=2.6.1
  Downloading python_dateutil-2.8.1-py2.py3-none-any.whl (227 kB)
Collecting pytz==2017.2
  Downloading pytz-2021.1-py2.py3-none-any.whl (510 kB)
Collecting Cython!=0.25.1,>=0.22
  Downloading Cython-0.29.23-cp37-cp37m-manylinux1_x86_64.whl (2.0 MB)
Collecting six>=1.5
  Downloading six-1.16.0-py2.py3-none-any.whl (11 kB)
```

Machine Expression

Ask Mr G ('Google'), articles, experience/comments share in the community

1 Answer

Active Oldest Votes

I had faced same problem. I used "conda" rather than "pip" for installation with steps shown below and it worked magical for me.

3

step 1: conda install -c anaconda ephem

3

step 2: conda install -c conda-forge pystan

3

step 3: conda install -c conda-forge fbprophet

Now you can go ahead with : "from fbprophet import Prophet" in python environment.

Share Improve this answer Follow

answered Apr 15 '20 at 13:51

Shalini Baranwal
1,928 2 20 31

Sharing: deploy in Streamlit



+

Your apps

Community Docs Settings Sign out

Your apps

Repository	Branch	File	...
jnewonggithub/forex-forecast	main	app.py	1
jnewonggithub/streamlit-forcasting	main	app.py	...
jnewonggithub/wine	main	app.py	...

New app

Deploy your app

Click "New app", then fill in your repo, branch, and file path, and click "Deploy".

Deploy an app

Apps are deployed directly from their GitHub repo. Enter the location of your app below.

Or [click here to fork and deploy a sample app](#).

Repository

<https://github.com/JaneWongGitHub/Forexcasting-2>

Paste GitHub URL

Branch

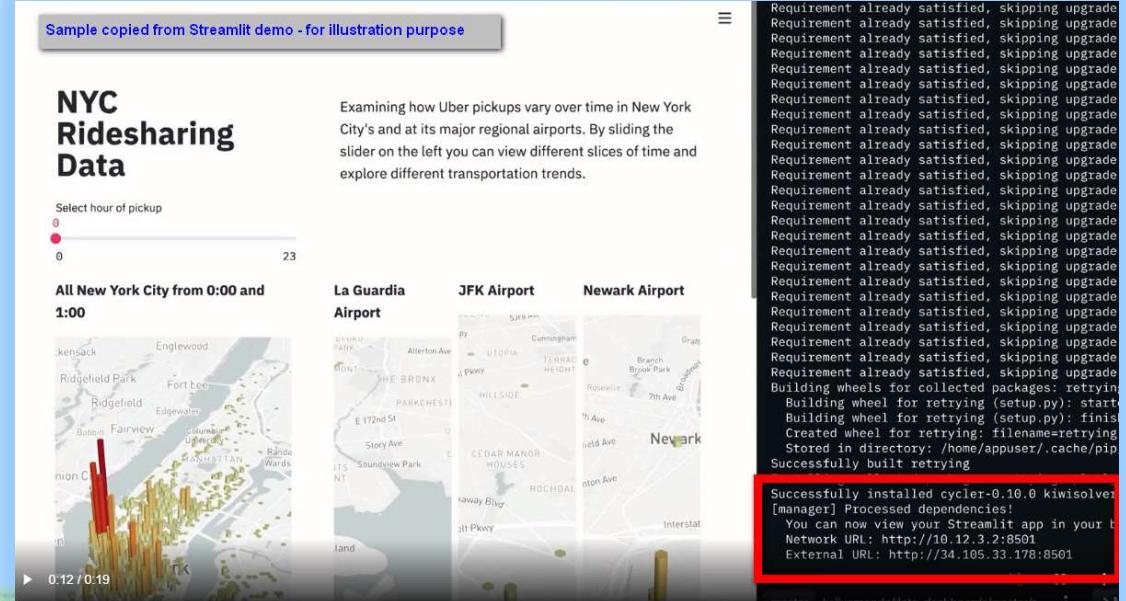
main

Main file path

app.py

Advanced settings...

Deploy!



Minimum Viable Product ('MVP'): FOREX - USDAUD Forecaster

showcase of our project via **Colab Notebook**

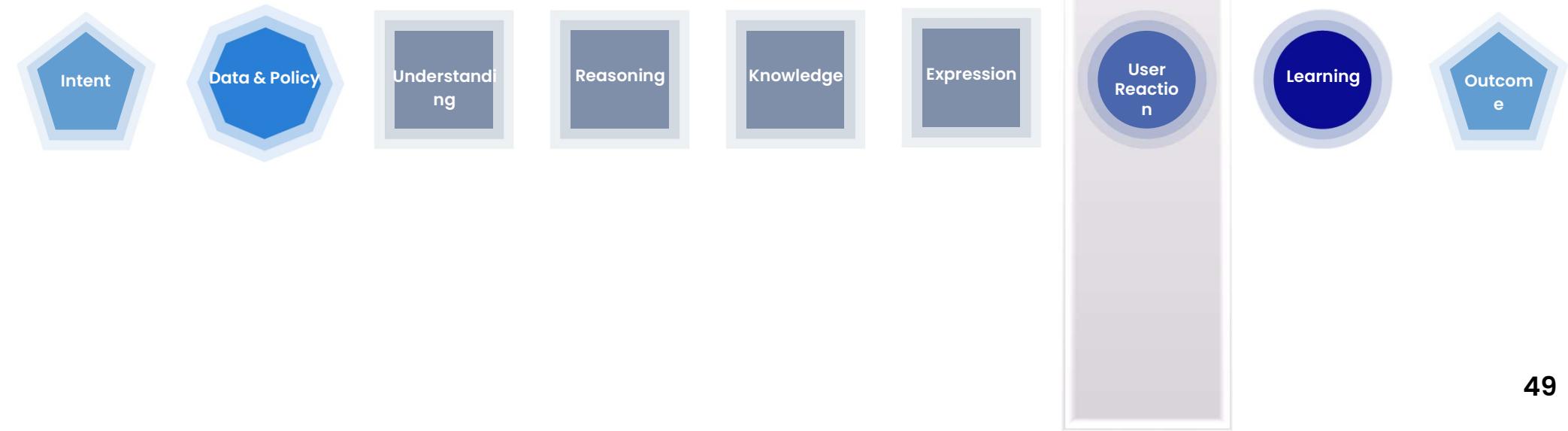
- Colaboratory ('Colab'):
 - own by Google
 - a web IDE for python
 - Colab notebook ('or' Jupyter notebook hosted by Colab)
-
- Key features, advantages:
 - Zero configuration required
 - Free access to GPUs
 - Easy sharing



MVP demo via Colab Notebook <switch screen>



Human



User Reaction

- The user's feedback and reaction to the expression from the output

What would end user want to see?

- Have a graph whereby touching the line chart will see the price (computer mouse or mobile by touch)?
- How accurate was the forecast?

Human

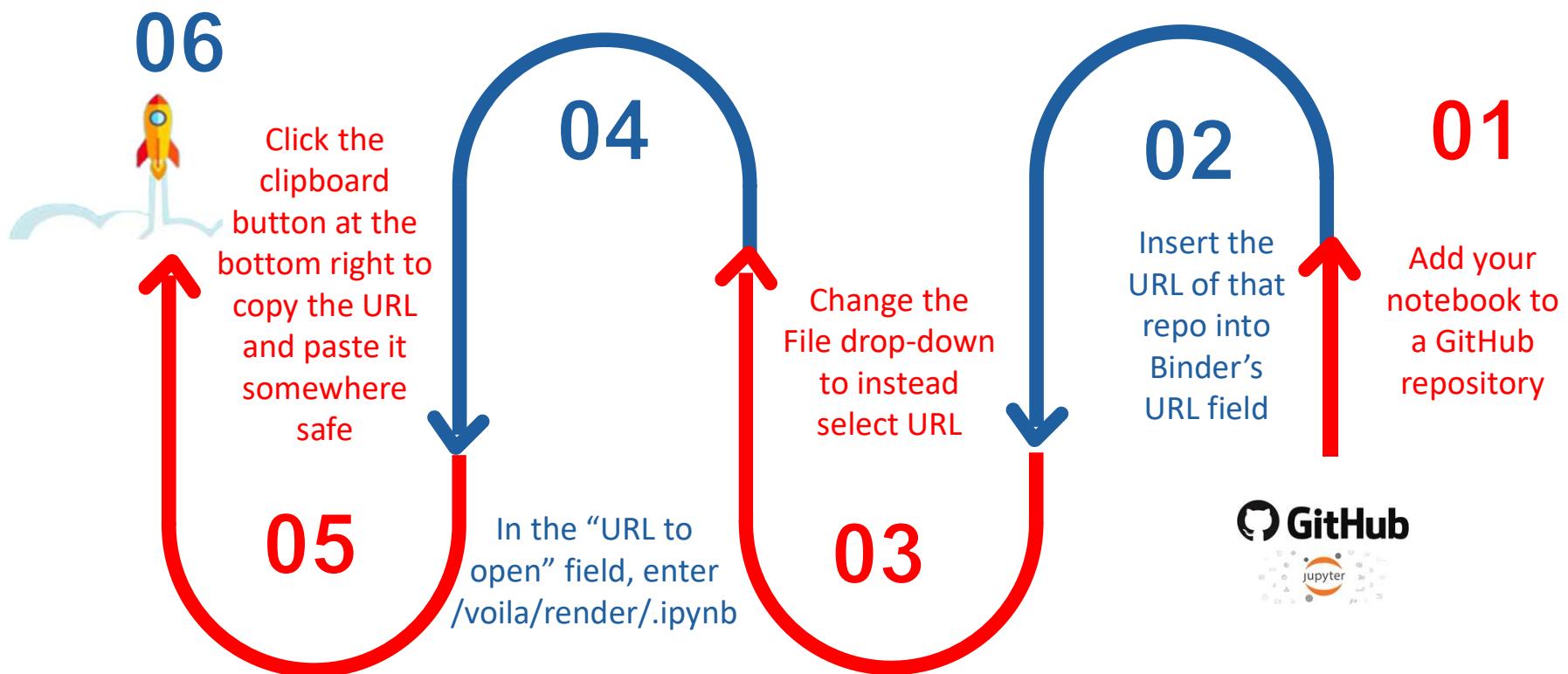


Monitoring of the MAE results?

Rating Comparison of deployment types

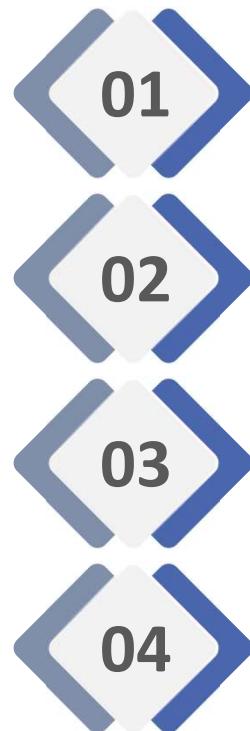
	Maturity	Popularity	Simplicity	Adaptability	Focus	Language support
Streamlit	C	A	A	C	Dashboard	Python
Dash	B	A	B	B	Dashboard	Python, R, Julia
Shiny	A	B	B	B	Dashboard	R
Voila	C	C	A	C	Dashboard	Python, R, Julia
Jupyter	A	A	B	B	Notebook	Python, R, Julia
Flask	A	A	B	A	Web framework	Python

Redeploy Jupyter Notebook with Voila instead of Streamlit with following steps:



Why deploy on Voila?

- Flask is a highly customized solution built from ground up requiring engineering capacity
- Flask may require to reimplement most of Voila library
- Streamlit uses custom widgets



- Voila is highly compatible with Jupyter Notebooks to convert them into stand-alone web applications
- Voila already has the Voila library
- Voila is easier to use just by knowing Jupyter
- Voila is suitable for dashboarding

Flask app deployment flow guide



Create a file
name app.py

- import numpy as np
- from flask import Flask, request, jsonify, render_template
- import pickle

- Load model using pickle command
- Save model in same directory or provide complete path to model

- app = Flask(__name__)
- @app.route('/')
- def home(): return render template('index.html')

Flask website deployment flow guide

Create template folder

Write our
index.html

Predict

Create
index.html

- A simple form with all text type input.
- Eg: Number of days to predict

`{{ url_for('predict')}}`

- Return predicted value in index.html using this `{{ prediction_text }}`.

Environment selection

Flask is a great, simple framework that can help you create a website. Using the Hello World! program which is static also allows migration to a more dynamic web page that accepts user inputs.

As a popular web framework, Flask also allows for the integration of plenty of other libraries and databases. There are lots of features and vast extensions available.

Model Consideration

LSTM is a type of recurrent neural network that finds patterns from past data that play out over time.

CNN has superior training time and computational intensity

Training times of the networks compared

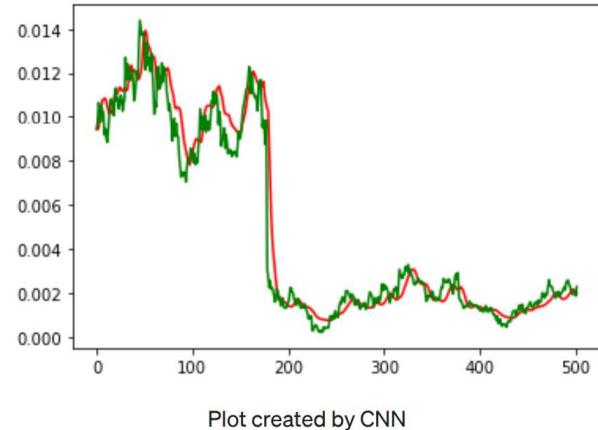
CNN: 20m 25s

LSTM: 34m 28s

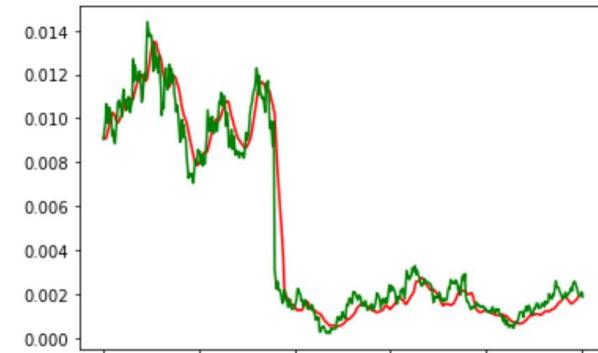
Here is the loss value of the LSTM as compared to the CNN:

CNN: 9.132824629887182e-07

LSTM: 9.205878086504526e-07



Plot created by CNN



Plot created by LSTM