



# Stock Market - Buy-Sell Recognition

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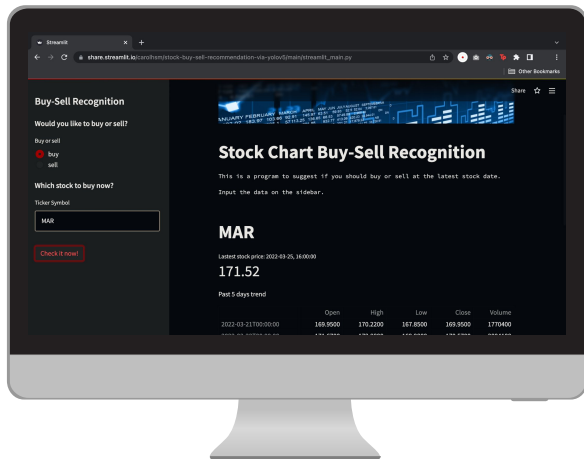
# Project Background

## Objective

Difficult for amateur traders to identify candlestick patterns from stock charts.  
Utilize image recognition to identify patterns.

## Our Aim

Build a program to find optimal buying and selling opportunities on-the-day for stocks of user preference.



## Programs / Libraries

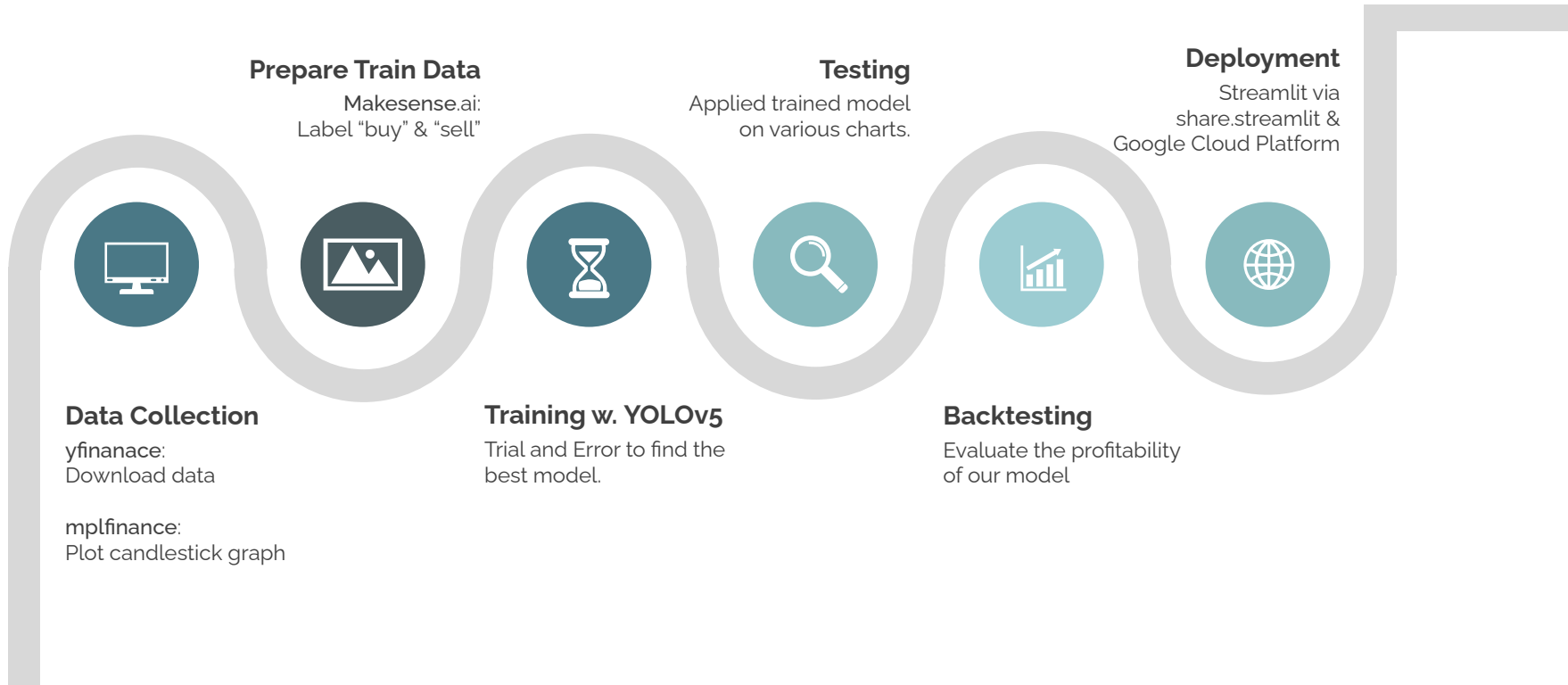
Programs: makesense.ai, streamlit cloud, google cloud

Libraries: yfinance, mplfinance, streamlit

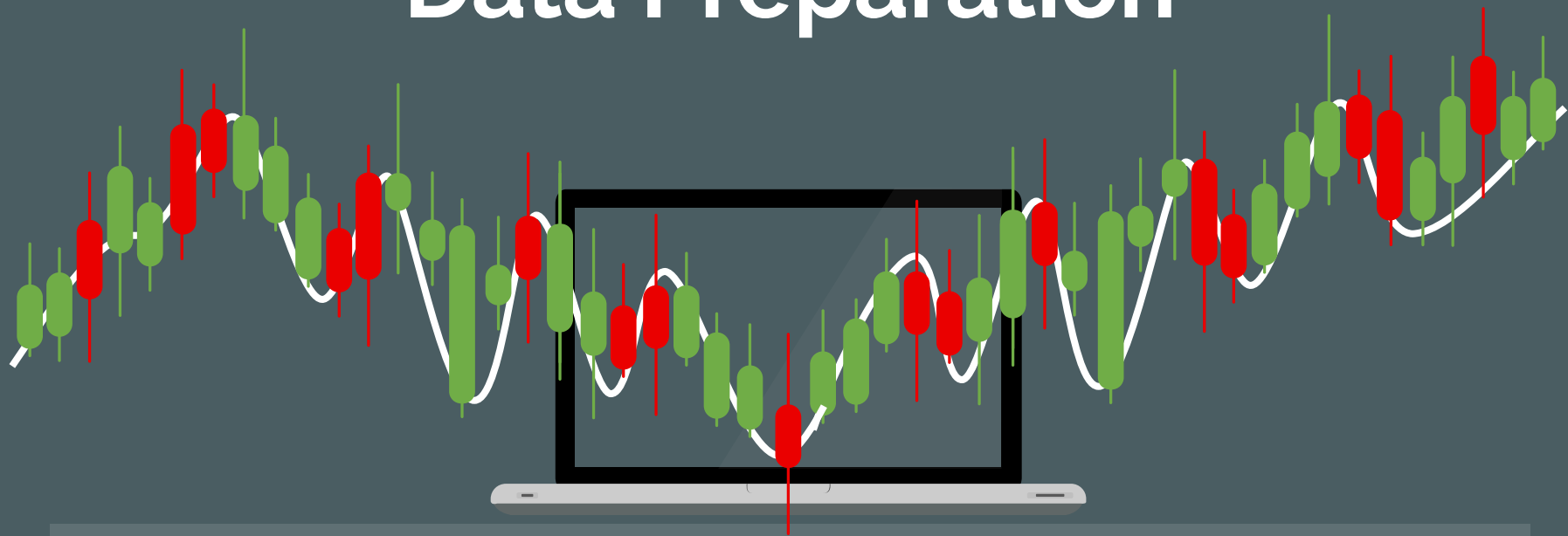
Pre-trained Model: YOLOv5

[https://share.streamlit.io/carolhsm/stock-buy-sell-recommendation-via-yolov5/main/streamlit\\_main.py](https://share.streamlit.io/carolhsm/stock-buy-sell-recommendation-via-yolov5/main/streamlit_main.py)

# Workflow



# Data Preparation



Downloaded Nasdaq top 50 stocks 10yrs data with the use of yfinance library



Plotted 100-days candlestick charts of grey background with mplfinance module



Labeled the buy and sell area with the help of makesense.ai

# Image Labeling Demo

SELL

BUY



Open source and free to  
use under GPLv3 license



No advanced installation  
required, just open up your  
browser



We don't store your  
images, because we don't  
send them anywhere



Support multiple label  
types - rects, lines, points  
and polygons



Support output file formats  
like YOLO, VOC XML, VGG  
JSON, CSV



Use AI to make your work  
more productive

GO  
M  
IO

Get Started

# Exported Annotations

SELL

BUY

LRCX 2020-05-01 to 2020-09-15(100 Days).txt

```
1 0.7695 0.305 0.031 0.17  
1 0.63125 0.198 0.0305 0.118  
0 0.40425 0.5505 0.0265 0.135
```

[ class, x\_center, y\_center, width, height ]



# Training and Testing



Trained **665 images** with the use of **Yolov5**



GPU and time is the issue - we tried various ways including Google Colab/Kaggle/Desktop



Noticed the importance of training data consistency and validation data choice (mAP 0.3 vs. 0.9)



Applied trained weight to detect other **new graphs** to review its **sensitivity**



Discovered the program rarely bound the edge - go against our app function



Added 5 fake candlesticks to the right of same price of last data point (previous slide)



Tried to apply the trained weight to graphs of **different time frame** (e.g. 50/150/200 days)



Sensitivity is less performing on other time frames



Sticked with 100-day chart in the deployment





# Backtesting



**BUY**



**SELL**



# Backtesting

- A total of 6 stocks outside of the training samples were used for backtesting
- Starting capital: 10,000 USD
- Look for the 1st buy day; sell all the stocks after 1 year
- Buy as much as we can when suggested to buy; sell all stocks when suggested to sell

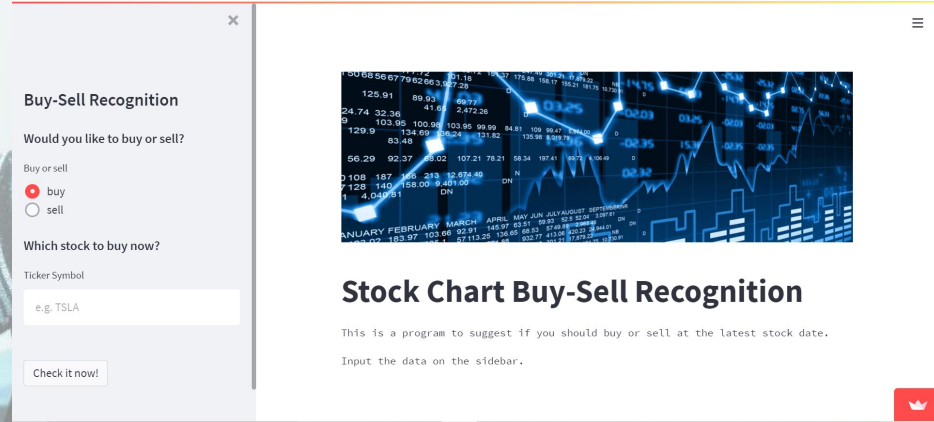


# Test result

Stock	Profit/Loss percentage
PYPL	+21.05%
LRCX	+23.88%
MAR	+89%
COST	+17.11%
ETSY	-8.32%
CMCSA	+30.17%

# Streamlit Deployment

- Users can choose their action: buy or sell
- If users choose to sell: stop loss check
- No need to look for the 'box'



The image shows a Streamlit web application interface. On the left is a sidebar with a title 'Buy-Sell Recognition' and a question 'Would you like to buy or sell?'. It contains two radio buttons: 'buy' (selected) and 'sell'. Below this is a section 'Which stock to buy now?' with a 'Ticker Symbol' input field containing 'e.g. TSLA' and a 'Check it now!' button. The main area on the right features a blue-themed stock chart with various data points and a title 'Stock Chart Buy-Sell Recognition'. Below the chart, there is a description: 'This is a program to suggest if you should buy or sell at the latest stock date. Input the data on the sidebar.' and a red 'Add' button in the bottom right corner.

# Streamlit Deployment

- The program is uploaded to Streamlit Cloud and Google Cloud
- Easy access
- Can ignore the modules installation process



# Further developments



A person in a dark suit is holding a tablet with their left hand and pointing at the screen with their right index finger. The tablet displays a candlestick chart with green and red bars and a blue line. The background is a dark, stylized city skyline at night, with a prominent skyscraper in the center. Overlaid on the city are several financial charts, including candlestick patterns and a green line graph that trends upwards from the bottom left towards the top right. The text "Thank You" and "Any Qs?" is displayed in white on the right side of the image.

# Thank You

Any Qs?