

01

# THREE BAR PATTERN

For Day Traders

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# TEAM



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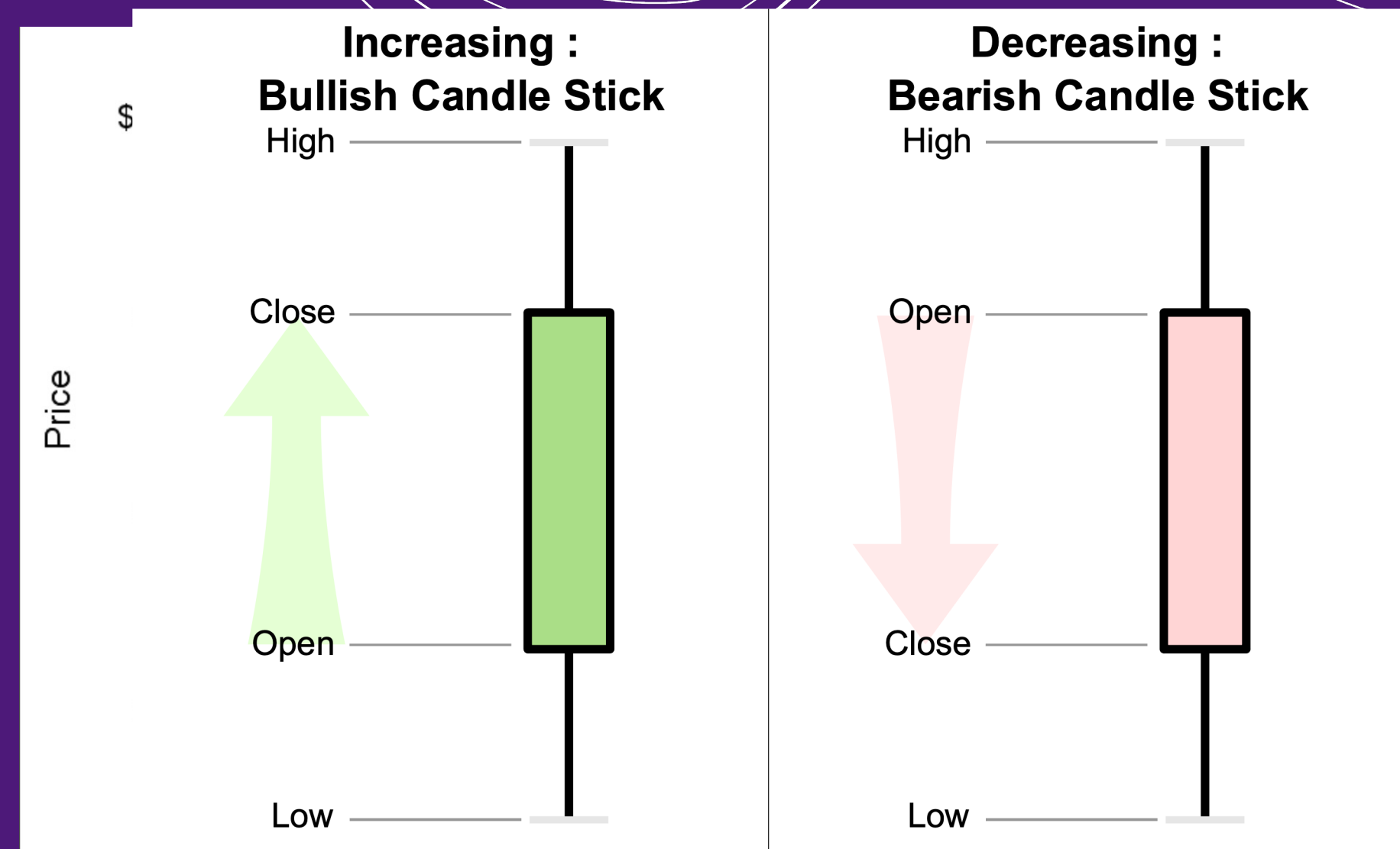


Alfredo Perez

# BACKGROUND

## Candlestick Graph:

- A graph commonly used in stock market to describe price movements.
- Each Candlestick consists of open, high, low, close data within a certain time frame

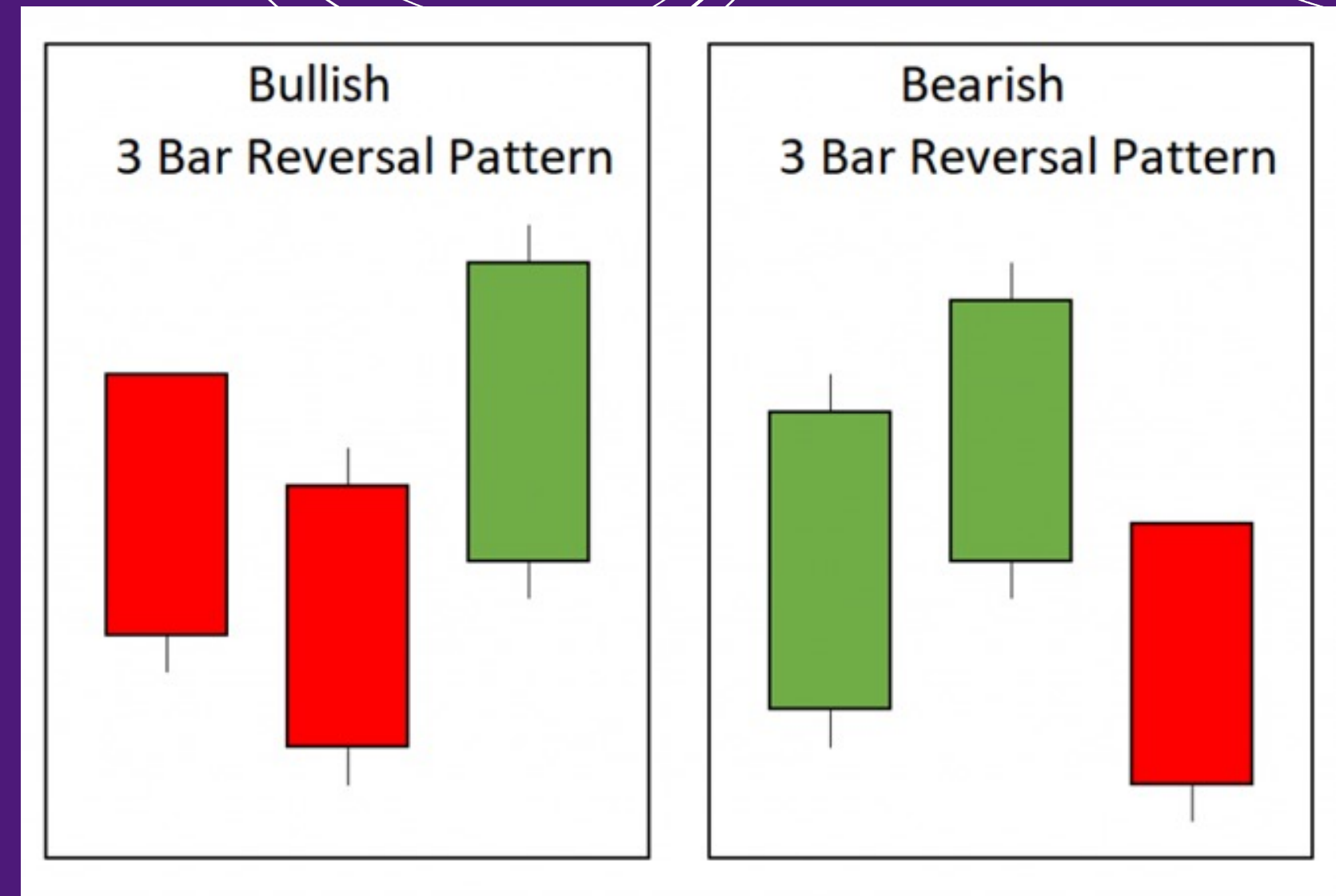




# BACKGROUND

Three bar pattern:

- A pattern in candlestick graphs that shows significant turning points in stock market.



# MOTIVATION

## PROBLEM 1

Once a potential three-bar pattern is found, day traders analyze and assess stock information to verify if the pattern is desired.

This cumbersome process often results in them missing the golden 3-5 minutes window of opportunity.

Three-bar pattern represents a major

turning point in the market, which

indicates the best moment to invest/sell.

## PROBLEM 2

Unfortunately, existing tools and websites provide incomplete analysis and often require a paid subscription.

# PROJECT GOAL

To develop a web application that will:

- Help day traders analyze historical trends based on previously identified three bar patterns
- Notify day traders of a three-bar pattern occurring in real time
- Help day traders recognize and analyze the three-bar pattern in real time





# OUR SOLUTION - THREE BAR PATTERN DETECTION ALGORITHM

## Multiple measuring factors

- Average length of previous bars
- Quantity of previous bars
- Upper tail and Lower tail ratio
- Bar color
- Market cap
- Price range
- Volume, etc.

## Preprocessing feature

- Remove Unnecessary data
- Eliminate Pre & Post market data
- Fill in blank data spot

# OUR SOLUTION - THREE BAR PATTERN DETECTION ALGORITHM

- Fully customizable parameters to fit different user needs
- Able to customize each individual bars parameters

### Filters & Settings

Price Range  
Lowest Range Highest Range

Market Cap  
Lowest Range Highest Range

Volume  
Lowest Range Highest Range

#### Bar 1

length\_t / average bar length >= 2

Uppertail ratio\_t <= 0.01

Lowertail ratio\_t <= 0.05

#### Bar 2

Abs(P\_start\_t+1 - P\_end\_t)/P\_end\_t <= 0.005

Length\_t+1/length\_t <= 0.5

Length\_t+1/length\_t >= 0.1

Uppertail ratio\_t+1 <= 0.02

Lowertail ratio\_t+1 <= 0.02

#### Bar 3

Abs(P\_start\_t+2-P\_end\_t+1)/P\_end\_t+1 <= 0.005

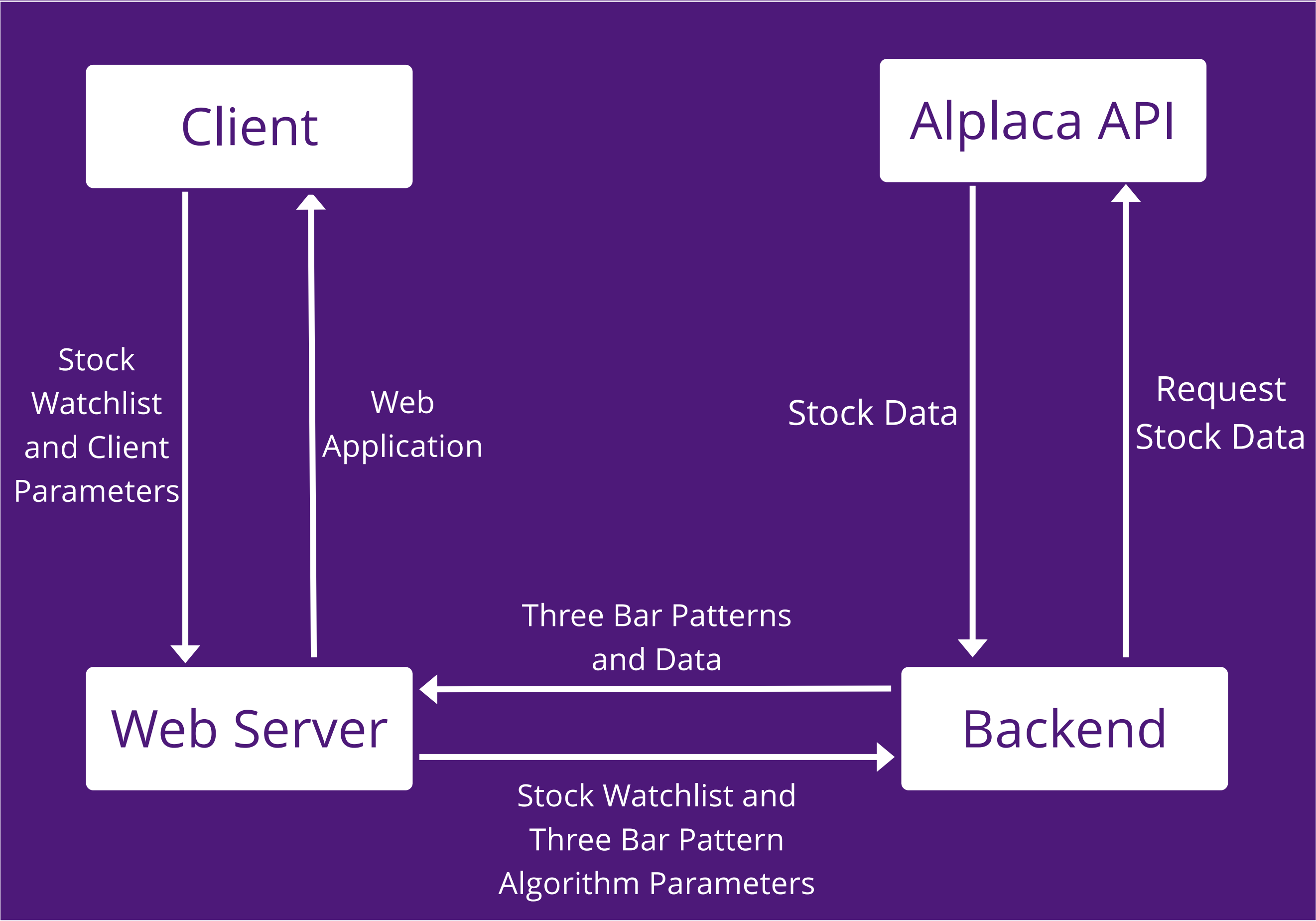
Length\_t+2/length\_t+1 >= 1.5

Uppertail ratio\_t+2 <= 0.02

Lowertail ratio\_t+2 <= 0.02

Close Apply

# OVERVIEW





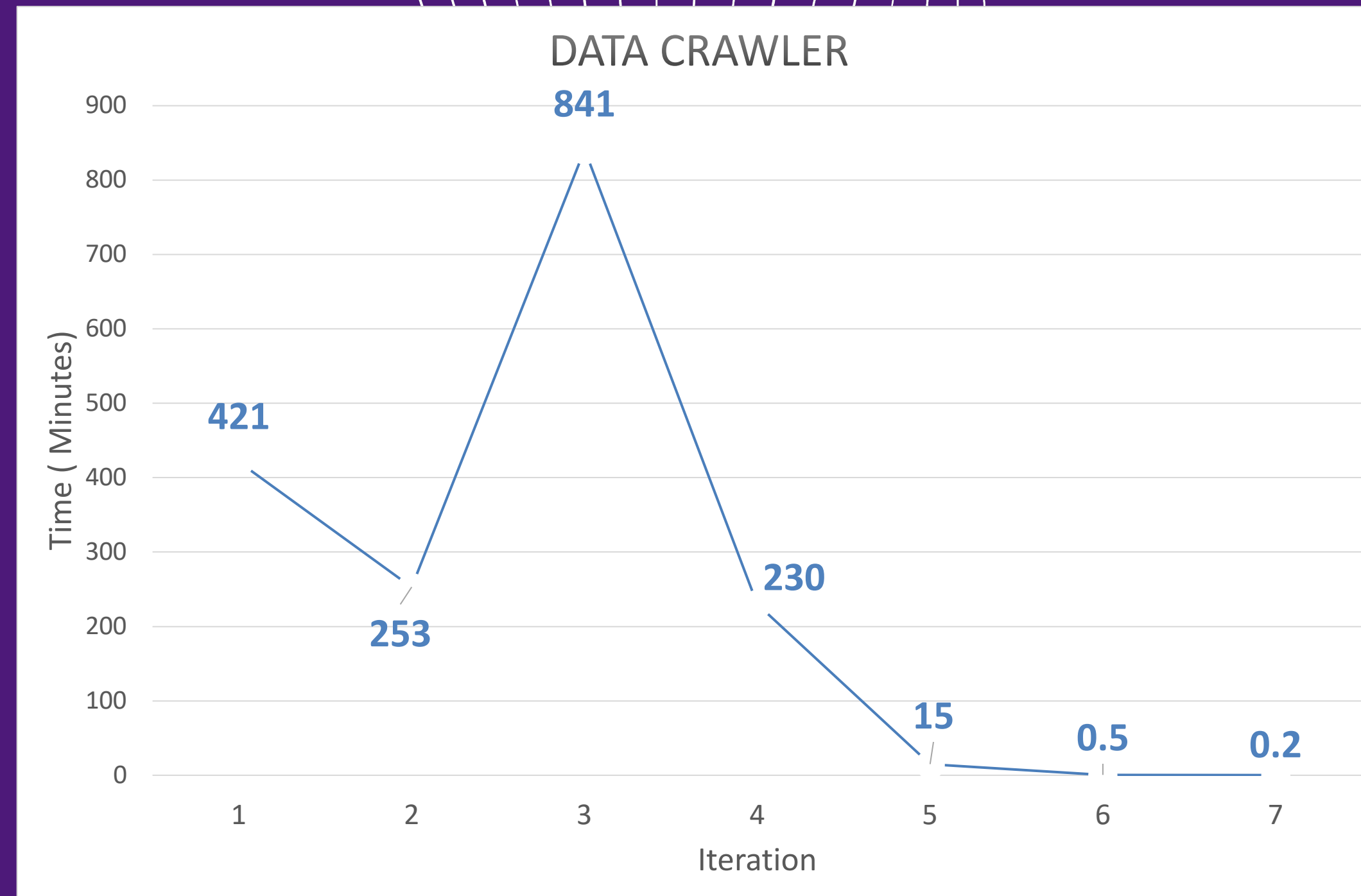
# Backend Process

## Data Crawler

- Pull the historical and real time stock data including open, high, low, close, volume.

### Improvement

- Preprocess data to remove false positives
- Asyncio to enhances performance and speed up historical and real time analysis



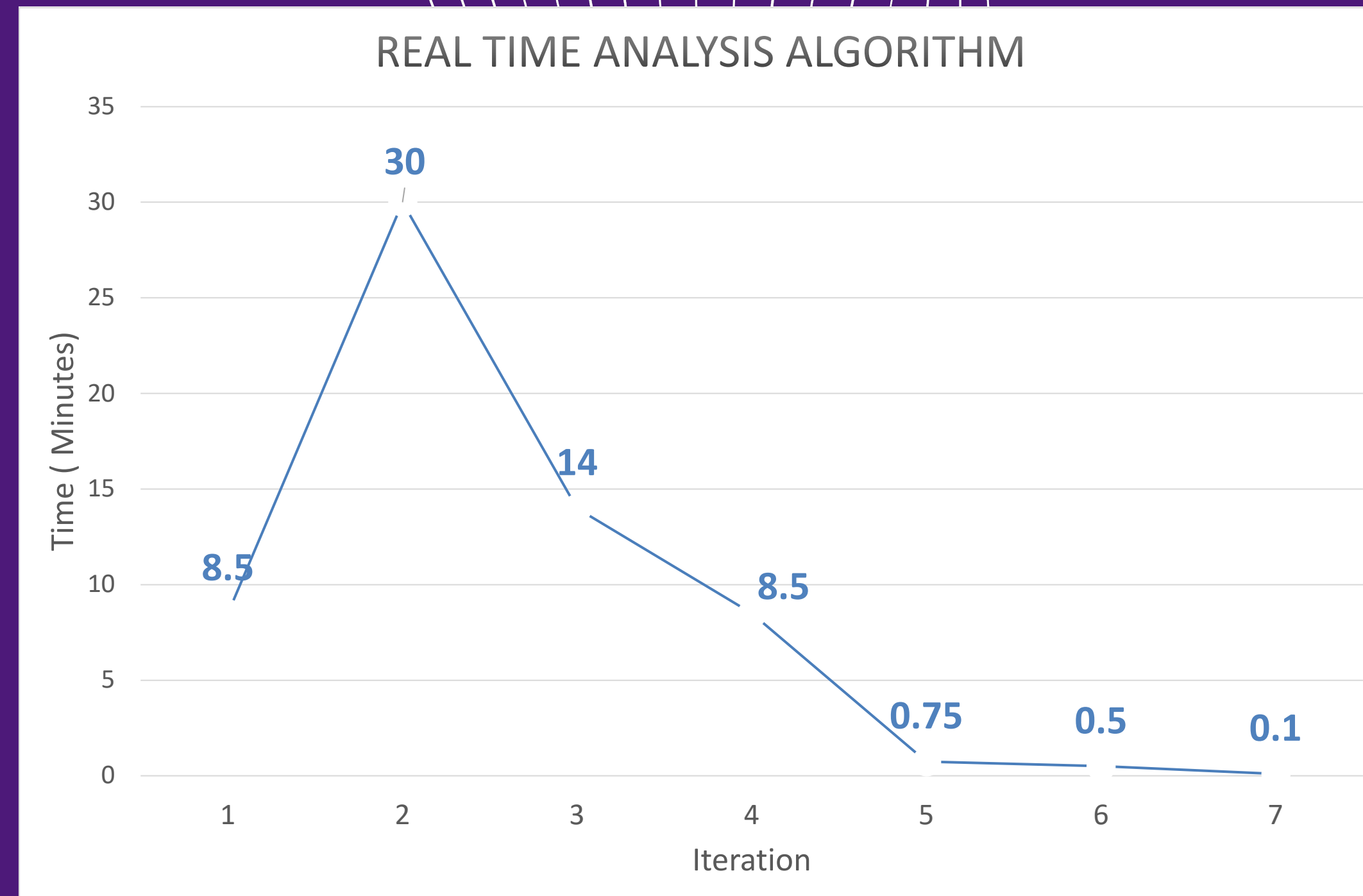
# Backend Process

## Core Algorithm

- Find three-bars in both real time and historical data based on specified parameters

## Improvement

- Applied parallel computing for quicker pattern recognition for real time analysis
- Scalability to track hundreds of stocks concurrently on computers with different specs



DEMO



# ROADBLOCKS

## PROCESSING SPEED

### Problem

- Real time analysis was not fast enough

### Solution

- Parallel computing and multithreading
- Asyncio to solve starvation

## RESOURCE USAGE

### Problem

- The algorithm performance was excessive and would use 100% of the local hosts' resources

### Solution

- Different algorithm for historical and live parts

# ROADBLOCKS

## DATA SOURCE

### Problem

- Can not find free and complete stock data source
- Most stock data API can not hold the amount of our requests

### Solution

- Alpaca API helped us tremendously

## DEPLOYMENT

### Problem

- Backend would not work in the AWS environment
- Websocket between backend and web server can not connect

### Solution

- A full week of debugging and testing

**THANK  
YOU!**

QUESTIONS?  
CLARIFICATIONS? LET US  
KNOW!

The project has been an inspiring journey for me by working with the student and faculties from TCU. The students team showed their excellent capability, creativity and enthusiasm in innovation. It also would not be possible for the project to come this far without the help from the faculty advisers, Prof. Ma and Prof. Wei. They offered their extraordinary help to make this project possible. I had great experience working with the whole team and deeply appreciate the efforts made by them. Thanks again for your devotion and wish you all have greater success in research and career. – Dr. Zhang