



isPyPatterns: Maximize Returns in the Short Term

IronHack Data Analytics Project -*Devi Rughani*

> INTRO

> PRICE
PATTERNS

> HYPOTHESIS
TESTS

> USER
APPLICATION

> MOVING
FORWARD

WHAT AND WHY?

1. Relevance of candlestick data
2. Automate decision making based on high probability returns
3. Simple, scalable and profitable

Powered By NDL/Quandl API:

1. Ready to use dataset
2. Public info (some require premium subscription)



Nasdaq Data Link



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HAMMERS AND SHOOTING STARS

Signal: Bullish Reversal

Hammer candlesticks typically occur after a price decline (often preceded by 3 or more declining candles).

They have a small real body and a long lower shadow.

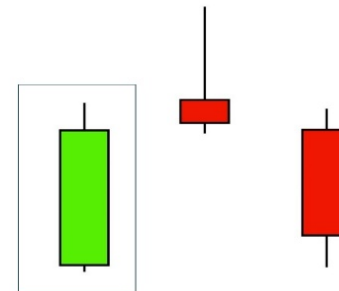
Signal: Bearish Reversal

A shooting star occurs after an advance in prices (often preceded by 3 or more rising candles).

Large upper body and very small, or no lower shadow.

> METHOD

Hammer Candlestick



Shooting Star

```

def hammer_scanner(df, company_name = None, email_to=None, min_wick_ratio=5, min_candle_size=0.4):

    df2 = df.copy()

    df2['Hammer']=" "

    for i in range(len(df2)):
        cond1 = df2.iloc[i,[0,3]].min() - df2.iloc[i,2] > (df2.iloc[i,1] - df2.iloc[i
[0,3]].max())*min_wick_ratio
        cond2 = df2.iloc[i,[0,3]].min() > (df2.iloc[i,2]+((df2.iloc[i,1]-df2.iloc[i,2])/2))
        cond3 = df2.iloc[i,2] < df2.iloc[i-10:i,2].min()
        cond4 = abs(df2.iloc[i,0]-df2.iloc[i,3])<((df2.iloc[i,1]-df2.iloc[i,2])*min_candle_size)

        if ( ( cond1 == True ) and ( cond2 == True ) and ( cond3 == True ) and (cond4 == True) ):
            df2.iloc[i,-1] = 1
            st.write("Hammers")

            company_hammers= df2[df2['Hammer'] == 1]
            if not company_hammers.empty:
                st.dataframe(company_hammers)
                st.write("According to our research on this company's historical data, \
if you buy at tomorrow's Open, there is more than 50% probability of making a
positive return in 5 days GIVEN an expected increase in prices")
                st.write(" ")

            if (email_to is not None):
                hammer_email_alert(company_name, email_to)

            #if (df2.iloc[i,-1] == 1) and (df2.index[i]== datetime.today().date()):

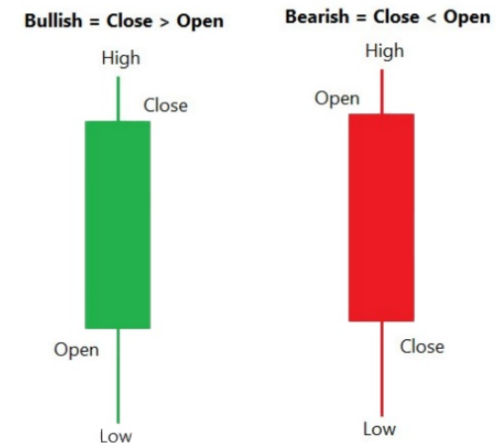
    else:
        df2.iloc[i,-1] = 0

```

Conditions are based on open, low, high, close of the day and trend of previous 10 days.

Optimize:

- min_wick_ratio
- min_candle_size



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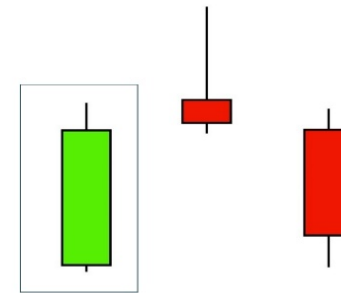
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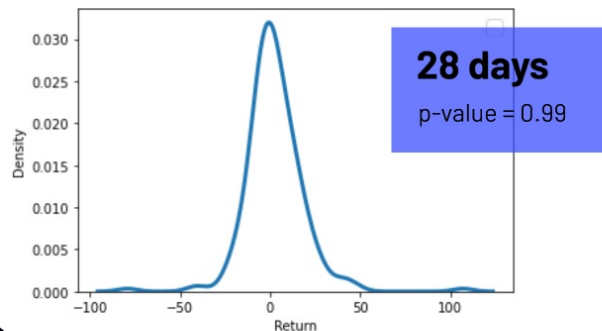
> MOVING
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> RESULTS: (HAMMERS)

1-sample, one-sided hypothesis tests:

- If one buys/sells day after pattern formation.
- 5, 14, 28 day % return
- On average, always positive

$h_0 = \text{mean return} > 0$
 $h_1 = \text{mean return} < 0$



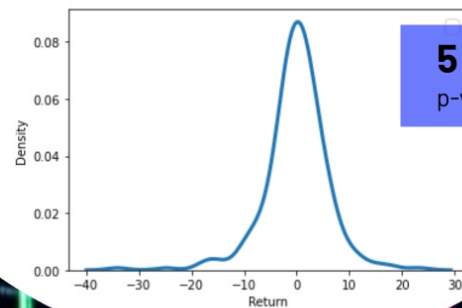
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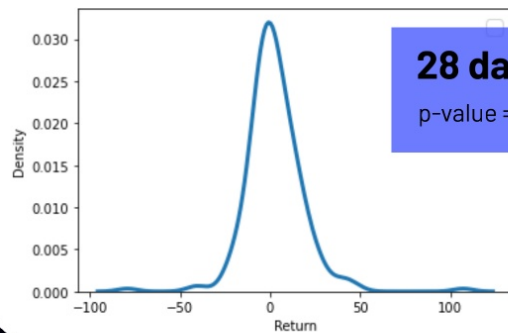
5 days
p-value = 0.45

> RESULTS: (HAMMERS)

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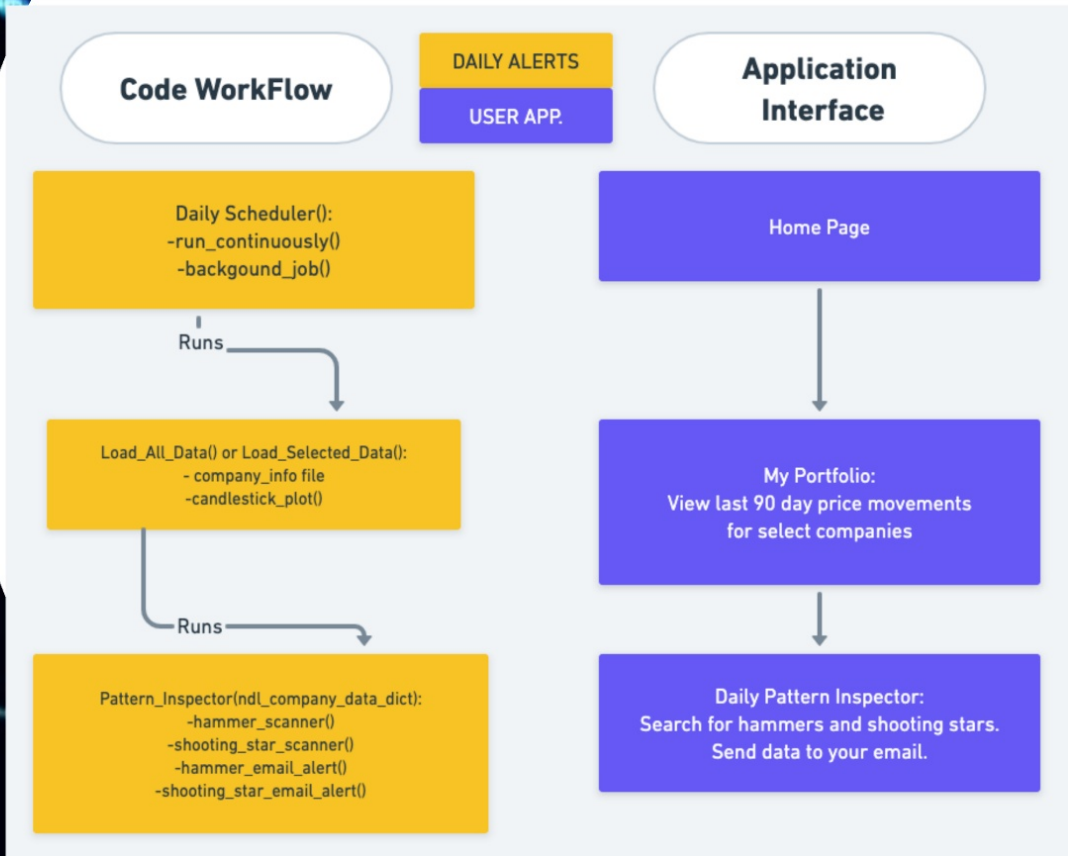
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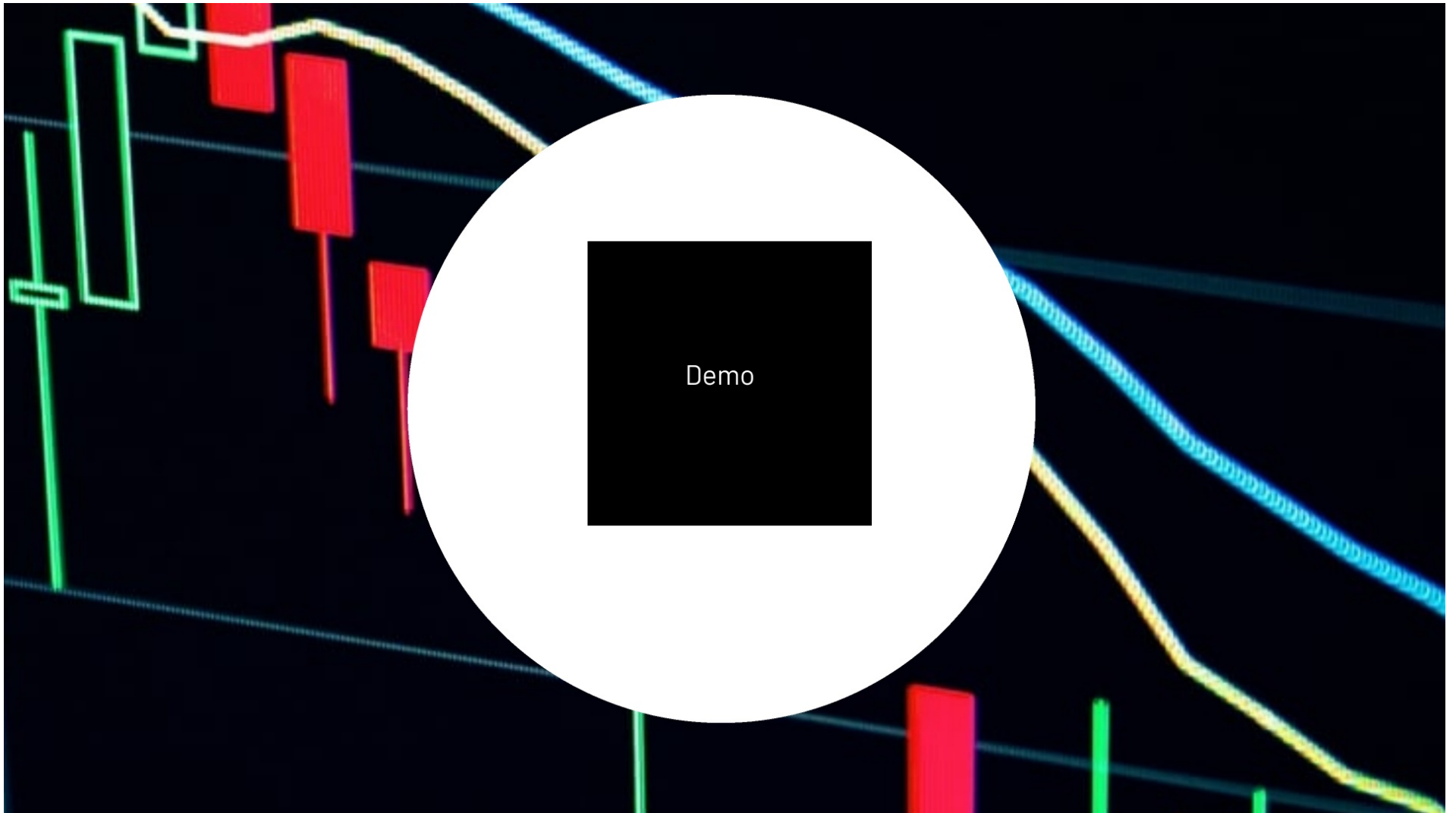


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WORKFLOW



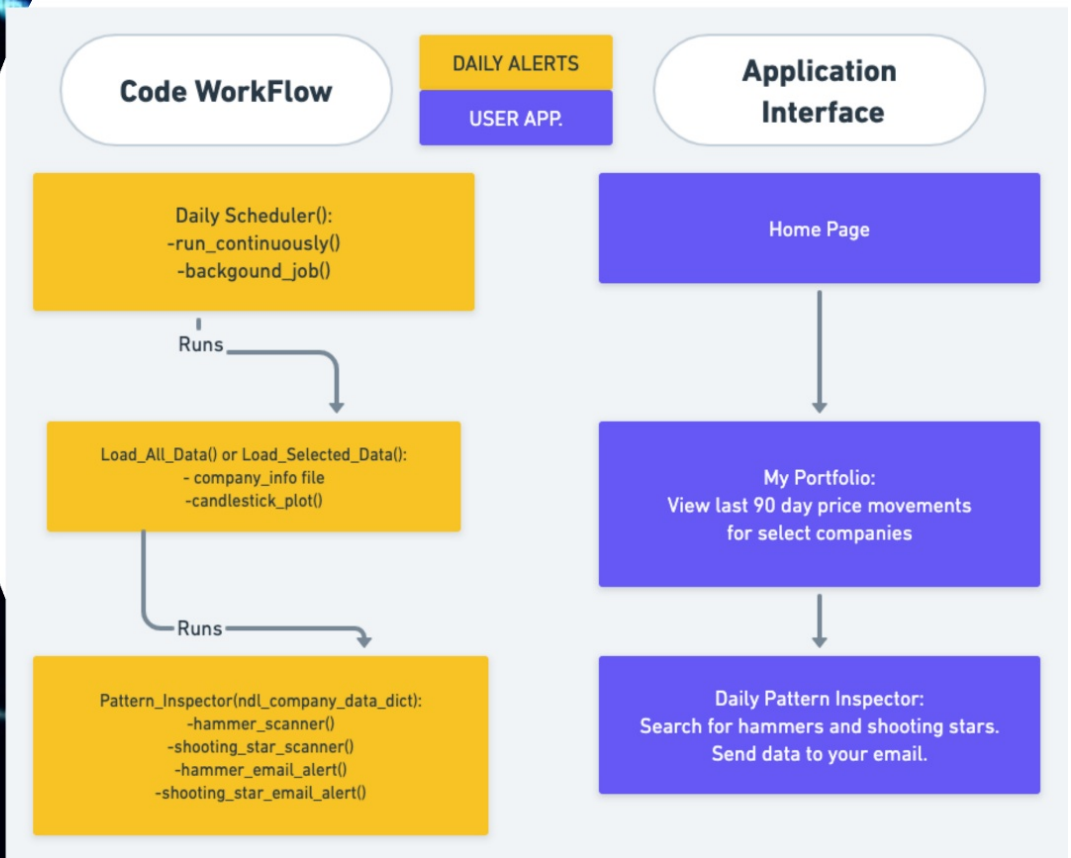




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WORKFLOW





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NEXT STEPS:

TIME SERIES MODELS

ARIMA, HOLT-WINTERS PROPHET

SCALE DATABASE

1000 TICKERS ON NASDAQ
DATA LINK

FURTHER HYPOTHESIS
TESTS

%RETURN AND COMPARE
INDUSTRIES

SEARCH FOR MORE
PATTERNS

COMBINE OTHER TECHNICAL
ANALYSIS

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