भारतीय प्रौद्योगिकी संस्थान गुवाहाटी
INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

Final_Assignment

Ma-374

Jwalit Devalia (200123026)

Problem Statement And How i addressed it

The problem statement is anazlying and predicting the trend of stockprice using various candlestick pattern.
For the purpose I have used Multiple candlestick patterns and Coded the candlestick pattern identification technique to identify various signal to buy and sell stock for 9 different stocks for a period of 1 year.I have also plotted the graph of cumulative profit earned.

Morning_star

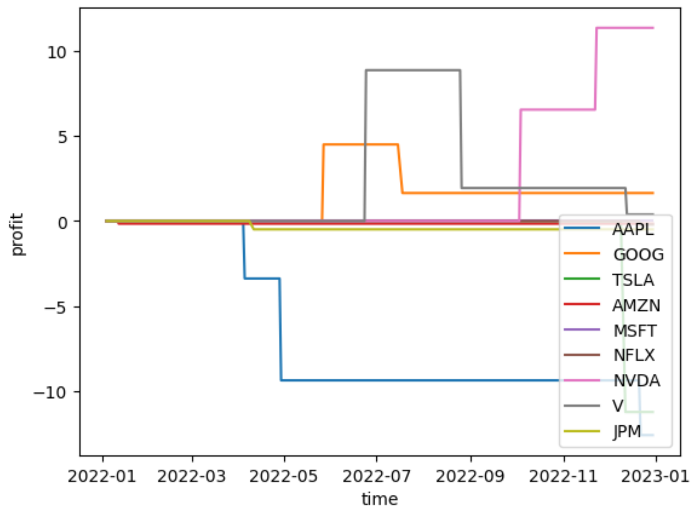
The morning star is a bullish candlestick pattern which evolves over a three day period. It is a downtrend reversal pattern. The pattern is formed by combining 3 consecutive candlesticks. The morning star appears at the bottom end of a downtrend. In the chart below the morning, the star is encircled.

The morning star pattern involves 3 candlesticks sequenced in a particular order. The pattern is encircled in the chart above. The thought process behind the morning star is as follow:

1. ***The market is in a downtrend placing the bears in absolute control. The market makes successive new lows during this period.***
2. ***On day 1 of the pattern (P1), as expected, the market makes a new low and forms a long red candle. The large red candle shows selling acceleration.***
3. ***On day 2 of the pattern (P2), the bears show dominance with a gap down opening. This reaffirms the position of the bears.***

4. After the gap down opening, nothing much happens during the day (P2) resulting in either a doji or a spinning top. Note the presence of doji/spinning top represents indecision in the market.
5. The occurrence of a doji/spinning sets in a bit of restlessness within the bears, as they would have otherwise expected another down day especially in the backdrop of a promising gap down opening.
6. On the third day of the pattern (P3), the market/stock opens with a gap, followed by a blue candle that manages to close above P1's red candle opening.
7. In the absence of P2's doji/spinning top, it would have appeared as though P1 and P3 formed a bullish engulfing pattern.
8. P3 is where all the action unfolds. On the gap up opening itself, the bears would have been a bit jittery. Encouraged by the gap up opening buying persists through the day, so much so that it manages to recover all the losses of P1.
9. The expectation is that the bullishness on P3 is likely to continue over the next few trading sessions, and hence one should look at buying opportunities in the market.

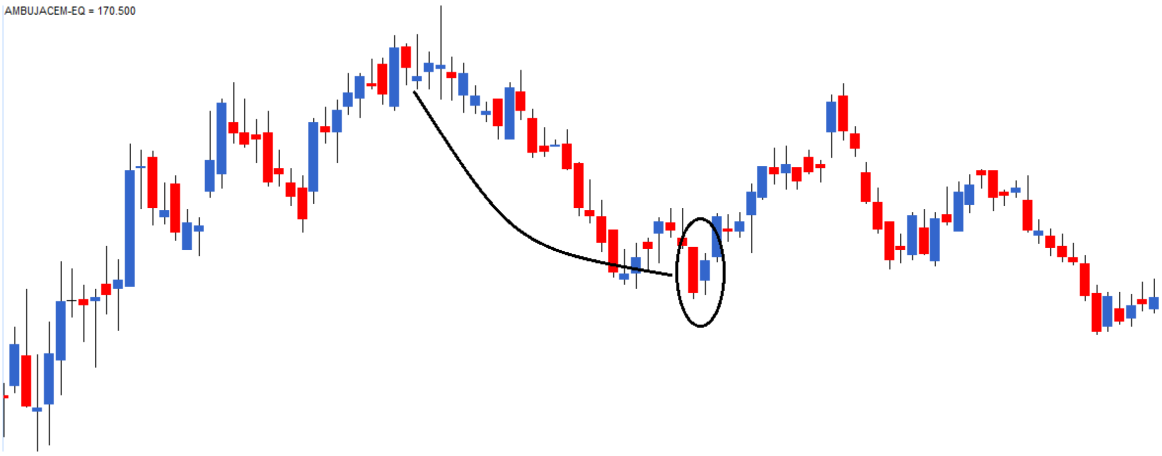
Graph For Cummulative Profit of various stocks over 1 year interval for implementing above strategy



Bullish_Harami

As the name suggests, the bullish harami is a bullish pattern appearing at the bottom end of the chart. The bullish harami pattern evolves over a two day period, similar to the engulfing pattern.

In the chart below, the bullish harami pattern is encircled.

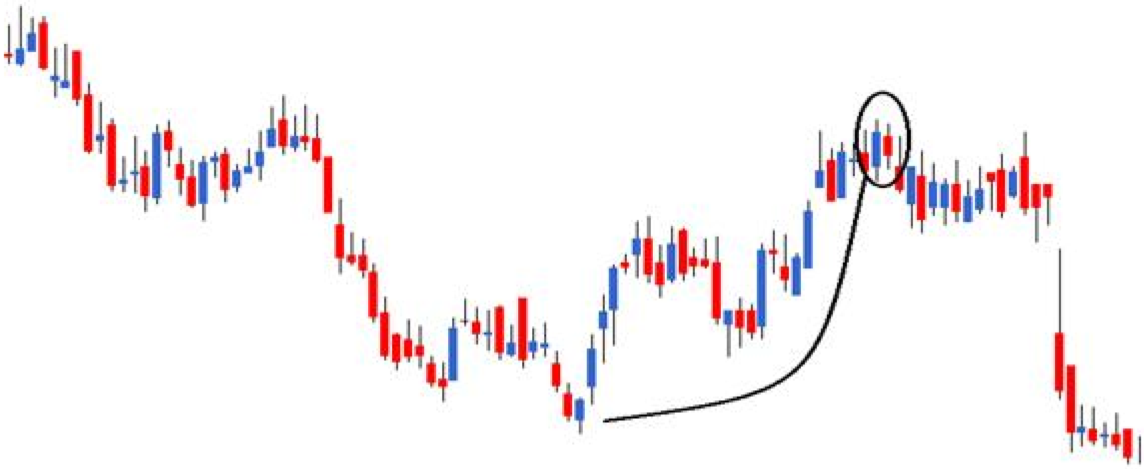


The thought process behind a bullish harami pattern is as follows:

1. *The market is in a downtrend pushing the prices lower, giving the bears absolute control over the markets.*
2. *On day 1 of the pattern (P1), a red candle with a new low is formed, reinforcing the bear's position in the market.*
3. *On day 2 of the pattern (P2), the market opens at a price higher than the previous day's close. On seeing a high opening price, the bears panic, as they would have otherwise expected a lower opening price.*
4. *The market gains strength on P2 and manages to close on a positive note, thus forming a blue candle. However, P2's closing price is just below the previous days (P1) open price.*
5. *The price action on P2 creates a small blue candle which appears contained (pregnant) within P1's long red candle.*
6. *The small blue candle on a standalone basis looks harmless, but what really causes the panic is that the bullish candle appears suddenly when it is least expected.*
7. *The blue candle not only encourages the bulls to build long positions but also unnerves the bears.*
8. *The expectation is that panic amongst the bears will spread faster, giving a greater push to bulls. This tends to push the prices higher. Hence one should look at going long on the stock.*

Bearish_Harami

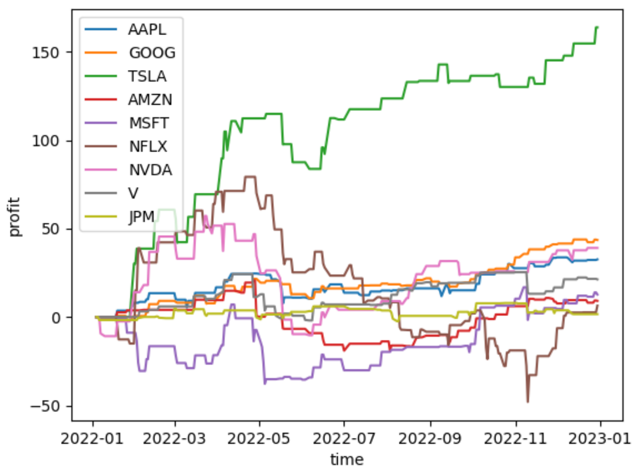
The bearish harami pattern appears at the top end of an uptrend, allowing the trader to initiate a short trade.



The thought process behind shorting a bearish harami is as follows:

1. ***The market is in an uptrend, placing the bulls in absolute control.***
2. ***On P1, the market trades higher and makes a new high and closes positively forming a blue candle day. The trading action reconfirms bulls dominance in the market.***
3. ***On P2 the market unexpectedly opens lower, displaces the bulls, and sets in a bit of panic to bulls.***
4. ***The market continues to trade lower to an extent where it manages to close negatively forming a red candle day.***
5. ***The unexpected negative drift in the market causes panic making the bulls to unwind their positions.***
6. ***The expectation is that this negative drift is likely to continue, and therefore one should look at setting up a short trade.***

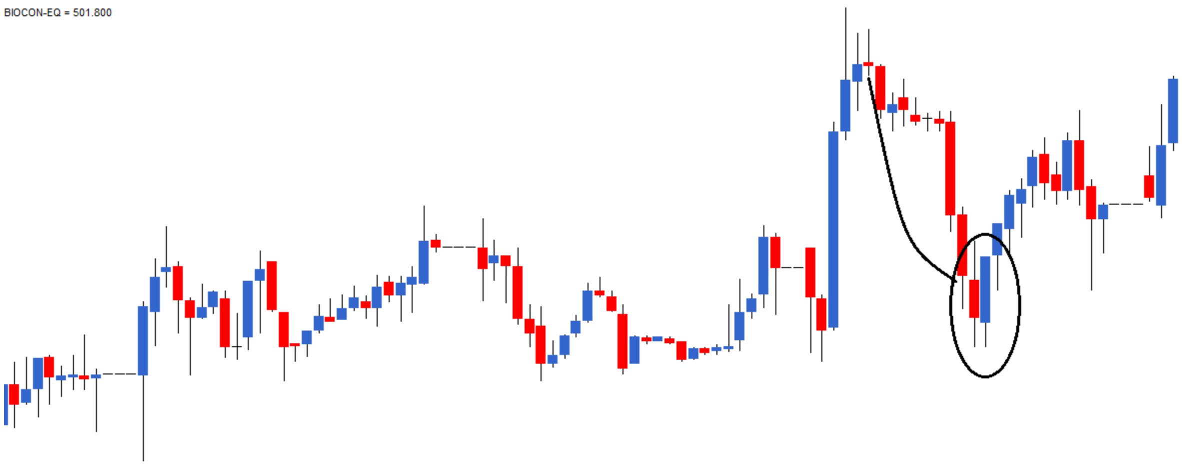
Graph For Cummulative Profit of various stocks over 1 year interval for implementing above strategy Combinely



Bullish_Engulfing

The bullish engulfing pattern is a two candlestick pattern which appears at the bottom of the downtrend. As the name suggests, this is a bullish pattern which prompts the trader to go long. The two-day bullish engulfing pattern is encircled in the chart below. The prerequisites for the pattern are as follows:

1. ***The prior trend should be a downtrend***
2. ***The first day of the pattern (P1) should be a red candle reconfirming the bearishness in the market***
3. ***The candle on the 2nd day of the pattern (P2) should be blue, long enough to engulf the red candle***



The thought process behind the bullish engulfing pattern is as follows:

1. ***The market is in a downtrend with prices steadily moving down***
2. ***On the first day of the pattern (P1), the market opens low and makes a new low. This forms a red candle in the process***
3. ***On the second day of the pattern (P2), the stock opens near the closing prices of P1 and attempts to make a new low. However, there is a sudden buying interest at this low point of the day, which drives the prices to close higher than the previous day's open. This price action forms a blue candle***
4. ***The price action on P2 also suggests that bulls made a very sudden and strong attempt to break the bearish trend, and they did so quite successfully. This is evident by the long blue candle on P2***
5. ***The bears would not have expected the bull's sudden action on P2 and hence the bull's action kind of rattles the bears causing them some amount of nervousness***
6. ***The bullishness is expected to continue over the next few successive trading sessions, driving the prices higher and hence the trader should look for buying opportunities***

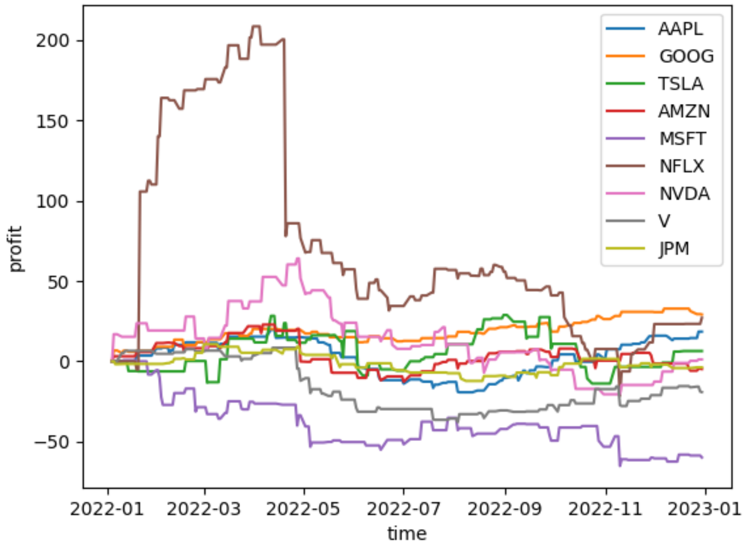
Bearish_Engulfing

The bearish engulfing pattern is a two candlestick pattern that appears at the top end of the trend, making it a bearish pattern. The thought process remains very similar to the bullish engulfing pattern, except one has to think about it from a shorting perspective.

Take a look at the chart below, the two candles that make up the bearish engulfing pattern is encircled. You will notice:

1. ***To begin with, the bulls are in absolute control, pushing the prices higher.***
2. ***On P1, as expected, the market moves up and makes a new high, reconfirming a bullish trend in the market.***
3. ***On P2, as expected, the market opens higher and attempts to make a new high. However, at this high point, selling pressure starts. This selling comes unexpected and hence tends to displace the bulls.***
4. ***The sellers push the prices lower, so much so that the stock closes below the previous day's (P1) open. This creates nervousness amongst the bulls.***
5. ***The strong sell on P2 indicates that the bears may have successfully broken down the bull's stronghold and the market may continue to witness selling pressure over the next few days.***
6. ***The idea is to short the index or the stock to capitalize on the expected downward slide in prices.***

Graph For Cummulative Profit of various stocks over 1 year interval for implementing above strategy Combinely



Evening star

The evening star is the last candlestick pattern that we would learn in this module.

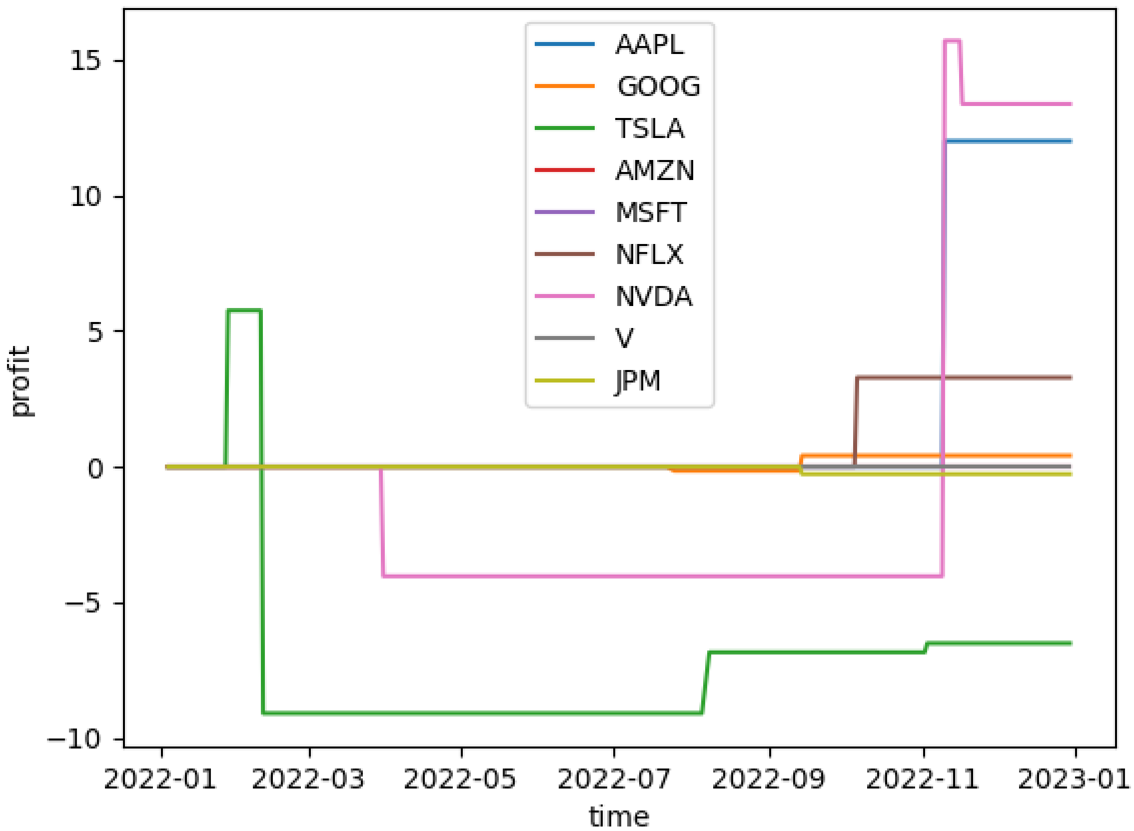
The evening star is a bearish equivalent of the morning star. The evening star appears at the top end of an uptrend. Like the morning star, the evening star is a three candle formation and evolves over three trading sessions.

The reasons to go short on an evening star are as follows:

1. ***The market is in an uptrend placing the bulls in absolute control***
2. ***During an uptrend, the market/stock makes new highs***
3. ***On the first day of the pattern (P1), as expected, the market opens high, makes a new high, and closes near the day's high point. The long blue candle formed on day 1 (P1) shows buying acceleration***

4. *On the 2nd day of the pattern (P2), the market opens with a gap reconfirming the bull's stance in the market. However, after the encouraging open, the market/stock does not move and closes by forming a doji/spinning top. The closing on P2 sets in a bit of panic for bulls*
5. *On the 3rd day of the pattern (P3), the market opens gap down and progresses into a red candle. The long red candle indicates that the sellers are taking control. The price action on P3 sets the bulls in panic*
6. *The expectation is that the bulls will continue to panic, and hence the bearishness will continue over the next few trading session. Therefore one should look at shorting opportunities*

Graph For Cummulative Profit of various stocks over 1 year interval for implementing above strategy



Conclusion

All of the signal identification method predict result correctly and When money was invested in all the 9 Stocks using the signal from the various candlestick a net profit was achieved with highest results for Harami Candlestick Pattern.

Required libraries are

```
import yfinance as yf

import pandas as pd

import numpy as np

import matplotlib.pyplot as plt
```