Wall Street Predictor

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This is application software to predict the daily Standard & Poor of New York Stock Exchange (NYSE) index behavior.

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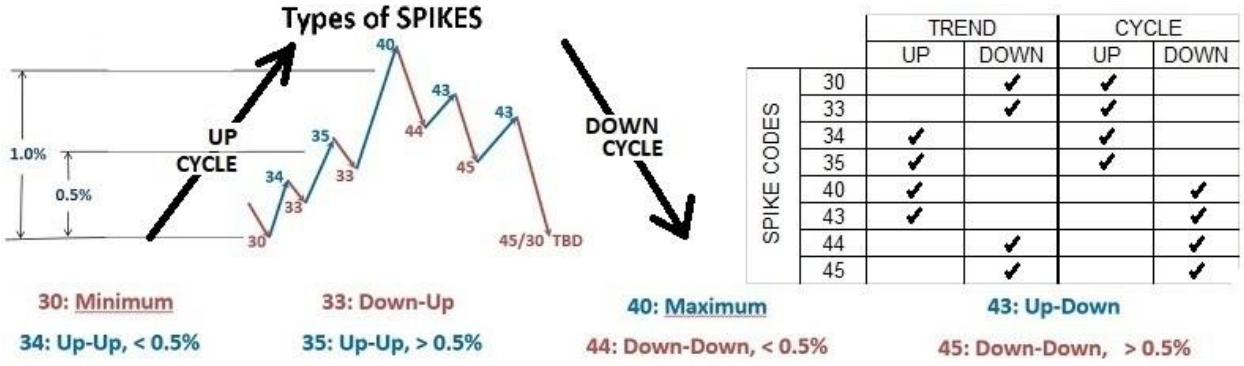
Contenido

1. Abstract

This is application software to predict the daily Standard & Poor of New York Stock Exchange (NYSE) index behavior.

It is based on the Spikes behavior of the Standard & Poor NYSE symbol SPY.

2. Spikes



SPIKE CODES	TREND UP	TREND DOWN	CYCLE UP	CYCLE DOWN
30		✔	✔	
33		✔	✔	
34	✔		✔	
35	✔		✔	
40	✔			✔
43	✔			✔
44		✔		✔
45		✔		✔

One spike usually appears two or three times per hour. As soon as it is generated, this app automatically analyses it to find if it is more similar to another one which belong to one UP cycle, or to another one which belong to one DOWN cycle.

Around 5% of the times, one option investment message is delivered with 95% of accuracy.

3. Inputs

The following 24 NYSE indicators from January 1st 2015 up today:

NYSE symbols: COMP, NYA, VIX, SPX

The following indicators are taking in account for each one of them:

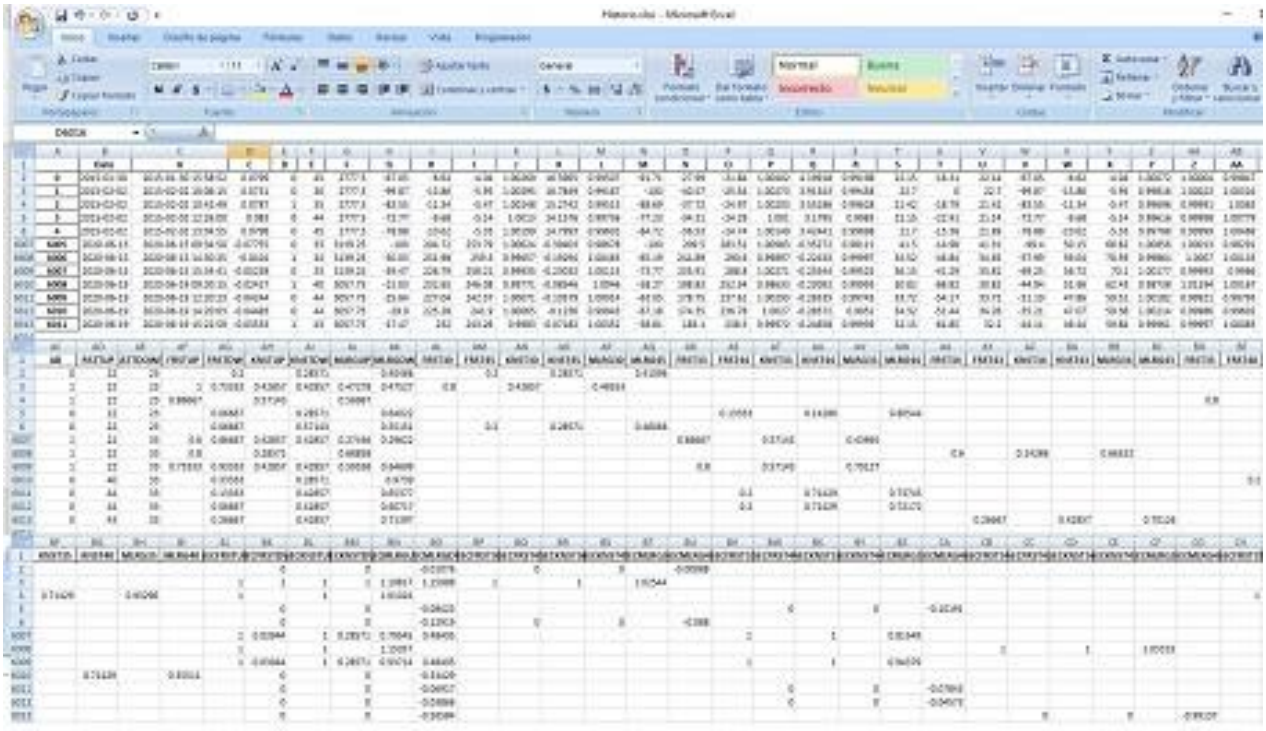
- Last Price
- Exponential Moving averages, length = 60
- Exponential Moving averages, length = 3
- Williams Percent R (stocastic)
- MACD Two Lines Exponential
- MACD Exponential

These are the 24 Originals Values. Two of them are discard. We call them 22OV.

3.1. Daily

During each NYSE round, once each 40 second one picture of these 22OV is taken and it is compared against the historical data, to predict if SPY value will raise or decrease during the current NYSE session.

3.2. Historic



This statistic data is used to train the 3 predictors.

More than 6000 spikes data with these 22 variables and others 68 values generated by this app for each spike/row, form the Historic statistic database, from January 1st 2015 up today.

This historic statistics database is updated once a week.

It is stored in the Historic DataFrame.

It has 90 fields for each row/spike. It includes date and time, code, trend, cycle, the 22OV, 30 first level predictions, and 30 second level predictions. 48 of them are 0.

This is the one of key factors. No one of these 22OV values (NYSE indicators) is available with any Internet API.

4. Technologies

This application software is developed in Python.

Machine Learning-Sci Kit Learn, Random Forest, K Nearest Neighbors and Multiple Linear Model Regression technologies tools are used to predict SPY behavior.

5. Code

This application is based on the following 11 modules:

Importing Libraries

1. Training
2. Averages
3. Load Fit Data
4. Second Spike
5. Manual
6. Tuning
7. Reset Signals
8. API
9. Operation
10. Output

* Only the comments lines and the line code numbers are included.

5.1. Importing libraries

- #2. Sklearn, numpy, pandas and others 12 Python libraries are imported.
- #27 End Importing Libraries

5.2. Training

- #2. Random Forest, K Nearest Neighbors and Multiple Lineal Model Regression predictors are trained with the following Historic DataFrame data.
- Spike trend, Column D: it is 1 if the spike trend is UP, codes 34, 35, 40 and 43, and it is 0 if the spike trend is DOWN, as it happens in codes 30, 33, 44 and 45. This value is always knew.
- Spike code, Column E: 30, 33, 34, 35, 40, 43, 44 and 45. Note that column AB for spike codes 30, 33, 34 and 35 is 1, and 0 for spikes codes 40, 43, 44 and 45.
- Cycle, Column AB: it is 1, if the spike belong to one UP cycle, and 0 if it belongs to one DOWN cycle of the SPY.
- Columns F to AA are the original 22 Original value for NYSE indicators, 22OV.
- #23. Random Forest UP/DOWN cycle
- The predictor is trained using the 22OV and column AB.
- Thus after the predictor be trained, the spike to be analyzed will has a greater probability to belong to one UP cycle as its value be closest to 1, and it will has a greater probability to belong to one DWON cycle as its value be closest to 0.
- #26. Define Dataset for UP/DOWN First level training
- #31 Define Dataset for Random Forest UP/DOWN Second level Training, adding the prediction of first level.
- #48. Train and save UP/DOWN Random Forest Predictor, first level
- #55. Train and save UP/DOWN Random Forest Predictor, second level
- #63. Random Forest for codes 30 & 45

- Spike codes 30 & 45 (column E) have both DOWN trend (column D:0), but spike code 30 belong to one UP cycle (Column AB:1) and code 45 spike belong to one DOWN cycle (Column AB:0).
- Thus after the predictor be trained, the spike to be analysed will has a greater probability to be one UP spike code 30 (which belong to one UP cycle) as the prediction value be closest to 1, and it will has a greater probability to be one DOWN spike code 45 (which belong to one DOWN cycle) as the prediction value be closest to 0.
- #75. Define Dataset for spike codes 30 & 45 First level training
- Only rowns/Spikes with code 30 and 45 are used to train this Predictor
- #80. Define Dataset for Random Forest for spikes codes 30 & 45 Second level Training, adding the prediction of first level.
- #94. Train and save 3045 Random Forest Predictor, first level
- #101. Train and save 3045 Random Forest Predictor, second level
- Same analysis is used below.
- #109. Random Forest for codes 33 & 44
- #147. Random Forest for codes 34 & 43
- #185. Random Forest for codes 35 & 40
- #225. K Nearest Neighbors UP/DOWN cycle
- #258. K Nearest Neighbors for codes 30 & 45
- #296. K Nearest Neighbors for codes 33 & 44
- #335. K Nearest Neighbors for codes 34 & 43
- #374. K Nearest Neighbors for codes 35 & 40
- #414. Multiple Linear Regression UP/DOWN cycle
- #447. Multiple Linear Regression for codes 30 & 45
- #485. Multiple Linear Regression for codes 33 & 44
- #523. Multiple Linear Regression for codes 34 & 43
- #561. Multiple Linear Regression for codes 35 & 40
- #636. End of training

5.3. Averages

- This module update the patterns reference values which should be improved by the current spike so that one investment signals can be delivered.
- Patterns DataFrame is a partial view of historic DF. It has the most representative, around 2%, Spikes codes.
- Patterns DF has date & dime, code, trend, cycle, 30FBP and 30SBP spike data. 22OV are not included
- We will compare current spike with all the spikes in patterns in order to find if the current has better prediction that someone with the corresponding spike code in patterns.
- To make this comparison we need the averages for the 60 variables, 30FBP plus 30SBP. We wil consider the averages for the complete histaoric DF and another set of averages for the patterns DF, which are a subset of the historic DF.

5.3.1. Back testing

- #54 for all the row/spikes and for the 3 predictor in Historic:
- FIRST: using the 22OV as input, 6 predictions will be calculated (3 UP/DW and 3 for the spike codes, one for each predictor):
- Probability that it belongs to one UP Cycle, if it did, and update the Historic DF corresponding field

- Probability that it belongs to one DOWN cycle, if it did, and update the Historic DF corresponding field
- Probability that it be one code 30 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 33 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 34 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 35 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 40 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 43 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 44 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 45 spike, if it was, and update the Historic DF corresponding field
- These values will be used as reference to compare current spike.
- Historic DF has 30 columns to store the values for the First level prediction, 24 of them are 0 for each row/spike.
- We call them, 30FBV
- SECOND: using the 6 values predicted in the previous step as input, another 6 will be updated as a second level prediction:
- Probability that it belongs to one UP cycle, if it did, and update the Historic DF corresponding field
- Probability that it belongs to one DOWN cycle, if it did, and update the Historic DF corresponding field
- Probability that it be one code 30 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 33 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 34 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 35 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 40 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 43 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 44 spike, if it was, and update the Historic DF corresponding field
- Probability that it be one code 45 spike, if it was, and update the Historic DF corresponding field
- These values will be also used as reference to compare current spike.
- These is a second level prediction. It is the prediction of the prediction.
- Historic DF has 30 columns to store the values for the Second level prediction, 24 of them are 0 for each row/spike.
- We call them 30SBV.
- Historic DF has 90 columns in total. See Input-Historic.

5.3.2. Averages

- #263. In this module the averages, maximum and minimum values, for historic DF and for patterns DF are calculated and saved to load them further as a fit data.
- #270. patterns = historic's view with the 30 variables/values defined in Backtesting (30BV).
- The averages of each one of them are calculated for the complete Historic DataFrame, and for the patterns view.
- #522. If the Spike belongs to one UP Cycle, the maximum value is stored, else the minimum.
- #650. End of Averages

5.4. Load fit data

- #2. Load trained predictors, spike patterns and averages of backtested predictors data from file to variables.
- #120 End Load Fit Data

5.5. Second Spike

- This function is used in the Manual and Operation module to define the spike to be processed to predict the second level prediction.
- Input: original spike with its 22 originals variables (22OV)
- Output: the original spike with the 30 First Backtesting Values (30FBV) added.
- #79 End Second Spike

5.6. Manual

- Input: one original spike with its 22 original values
- Output:
- First Randon Forest Preiction
- First K Nearest Neigbors Prediction
- First Multiple Linear Regression Prediction
- Second Randon Forest Prediction
- Second K Nearest Neigbors Prediction
- Second Multiple Linear Regression Prediction

5.6.1. MANUAL UP/DOWN

- #17. Read original spike to be predicted
- #24. Random Forest Prediction for the spike
- The probability that the spike belongs to one UP CYCLE, will be greater if the Random Forest prediction output is closest to 1.
- The probability that the spike belongs to one DOWN CYCLE, will be greater if the Random Forest prediction output is closest to 0.
- #30. K Nearest Neighbors Prediction for the spike
- The probability that the spike belongs to one UP CYCLE, will be greater if the K Nearest Neighbors prediction output is closest to 1.
- The probability that the spike belongs to one DOWN CYCLE, will be greater if the K Nearest Neighbors prediction output is closest to 0.

- #36. Multiple Linear Regression Prediction for the spike
- The probability that the spike belongs to one UP CYCLE, will be greater if the Multiple Linear Regression prediction output is closest to 1.

- The probability that the spike belongs to one DOWN CYCLE, will be greater if the Multiple Linear Regression prediction output is closest to 0.
- #47. Second level Prediction. The prediction of the prediction.
- #48. Define Second Spike
- #50. Random Forest, 2nd level prediction
- #51. Define Second Spike for Random Forest prediction, adding the first level Random Forest predictions
- #54. Second Level Random Forest Prediction for the second spike
- The probability that the spike belongs to one UP CYCLE, will be greater if the Random Forest second level prediction output is closest to 1.
- The probability that the spike belongs to one DOWN CYCLE, will be greater if the Random Forest second level prediction output is closest to 0.
- #59. K Nearest Neighbors, 2nd level prediction
- #60. Define Second Spike for K Nearest Neighbors prediction, adding the first level K Nearest Neighbors predictions
- #64. Second Level K Nearest Neighbors Prediction for the second spike
- The probability that the spike belongs to one UP CYCLE, will be greater if the K Nearest Neighbors second level prediction output is closest to 1.
- The probability that the spike belongs to one DOWN CYCLE, will be greater if the K Nearest Neighbors second level prediction output is closest to 0.
- #69. Multiple Linear Regression, 2nd level prediction
- #70. Define Second Spike for Multiple Linear Regression prediction, adding the first level Multiple Linear Regression predictions
- #74. Second Level Multiple Linear Regression Prediction for the second spike
- The probability that the spike belongs to one UP CYCLE, will be greater if the Multiple Linear Regression second level prediction output is closest to 1.
- The probability that the spike belongs to one DOWN CYCLE, will be greater if the Multiple Linear Regression second level prediction output is closest to 0.
- #85. End of MANUAL UP(1)/DOWN(0)
- It is also named MANUAL 10.

5.6.2. MANUAL 3045

- This module can be executed as a second prediction, in order to confirm the one of MANUAL 10, in any of this two cases:
- a. if MANUAL 10 forecast predicts that the spike could belong to one UP CYCLE.
- This new prediction will tell you the probability that this spike be one spike CODE=30.
- b. if MANUAL 10 forecast predicts that the spike could belong to one DOWN CYCLE.
- This new prediction will tell you the probability that this spike be one spike CODE=45.
- It works as a confirmation prediction.
- Forecast Output:
- Note that the difference between one spike CODE=30 and another one CODE=45, is that the first one belong to one UP trend, and the second one to onw DOWN trend.
- #17. Read original spike to be predicted
- #24. Random Forest 3045 prediction for the spike
- The probability that the spike could be one CODE=30, will be greater if the Random Forest 3045 prediction output is closest to 1.

- The probability that the spike could be one CODE=45, will be greater if the Random Forest 3045 prediction output is closest to 0.
- #30. K Nearest Neighbors 3045 prediction for the spike
- The probability that the spike could be one CODE=30, will be greater if the K Nearest Neighbors 3045 prediction output is closest to 1.
- The probability that the spike could be one CODE=45, will be greater if the K Nearest Neighbors 3045 prediction output is closest to 0.
- #36. Multiple Linear Regression 3045 prediction for the spike
- The probability that the spike could be one CODE=30, will be greater if the Multiple Linear Regression 3045 prediction output is closest to 1.
- The probability that the spike could be one CODE=45, will be greater if the Multiple Linear Regression 3045 prediction output is closest to 0.
- #47. Second level 3045 Prediction. The prediction of the prediction.
- #48. Define Second Spike
- #50. Random Forest, 2nd level prediction
- #51. Define Second Spike for Random Forest prediction, adding the first level Random Forest predictions
- #55. Second Level Random Forest 3045 prediction for the second spike
- The probability that the spike could be one CODE=30, will be greater if the Random Forest second level prediction output is closest to 1.
- The probability that the spike could be one CODE=45, will be greater if the Random Forest second level prediction output is closest to 0.
- #61. K Nearest Neighbors, 2nd level prediction
- #62. Define Second Spike for K Nearest Neighbors prediction, adding the first level K Nearest Neighbors predictions
- #66. Second Level K Nearest Neighbors 3045 prediction for the second spike
- The probability that the spike could be one CODE=30, will be greater if the K Nearest Neighbors second level prediction output is closest to 1.
- The probability that the spike could be one CODE=45, will be greater if the K Nearest Neighbors second level prediction output is closest to 0.
- #72. Multiple Linear Regression, 2nd level prediction
- #73. Define Second Spike for Multiple Linear Regression prediction, adding the first level Multiple Linear Regression predictions
- #77. Second Level Multiple Linear Regression 3045 prediction for the second spike
- The probability that the spike could be one CODE=30, will be greater if the Multiple Linear Regression second level prediction output is closest to 1.
- The probability that the spike could be one CODE=45, will be greater if the Multiple Linear Regression second level prediction output is closest to 0.
- #88 End MANUAL 3045

5.6.3. MANUAL 3344

- Idem MANUAL 3045
- Forecast Output:
- The spike could be one CODE=33, if the prediction is closest to 1.
- The spike could be one CODE=44, if the prediction is closest to 0.
- #59 End Manual 3344

5.6.4. MANUAL 3443

- Idem MANUAL 3045
- Forecast Output:
- The spike could be one CODE=34, if the prediction is closest to 1.
- The spike could be one CODE=43, if the prediction is closest to 0.
- #60 End MANUAL 3443

5.6.5. MANUAL 3540

- Idem MANUAL 3045
- Forecast Output:
- The spike could be one CODE=30, if the prediction is closest to 1.
- The spike could be one CODE=45, if the prediction is closest to 0.
- #59 End MANUAL 3540

5.7. Tuning

- In the Operation Module can be generated 112 different positive signals. Another 112 can be also generated by the else condition.
- Here we will assign one potentiometer to work together its corresponding signal, in order to tuning each one of these positive signals. If we detect that some signal fails, we will increase the pote to avoid a new wrong signals be delivered again.
- #60 14 Potes for signals corresponding to first prediction, trend up, 1/2/3 conditions (codes 30/33). CODEWINFIRUP
- #75 14 Potes for signals corresponding to first prediction, trend down, 1/2/3 condition (codes 40/43). CODEWINFIRDW
- #90 14 Potes for signals corresponding to first prediction, trend up, 1/2/3 conditions (codes 34/35) CODEWINFIRNOTUP
- #105 14 Potes for signals corresponding to first prediction, trend down, 1/2/3 condition (codes 40/43).CODEWINFIRNOTDW
- #121 14 Potes for signals corresponding to second prediction, trend up, 1/2/3 conditions (codes 30/33). CODEWINSECUP
- #136 14 Potes for signals corresponding to second prediction, trend down, 1/2/3 condition (codes 40/43). CODEWINSECDW
- #151 14 Potes for signals corresponding to second prediction, trend up, 1/2/3 conditions (codes 34/35) CODEWINSECNOTUP
- #166 14 Potes for signals corresponding to second prediction, trend down, 1/2/3 condition (codes 40/43).CODEWINSECNOTDW
- #184 End of Tuning

5.8. Reset Signals

- signals DataFrame is reseted, so that the daily spike can be processed again.
- #19 End of Reset signals

5.9. API

- Each 40 second one NYSE picture with the 24OV is taken.
- If it correspond to one Spike, it will added to the Spike Historic DataFrame, so that it can be predicted if it could one investment opportunity or not.
- It is executed by one external Excel Macro which import the 22OV from one NYSE broker

5.10. Operation

- #24 while NYSE session is open, do the following once each 40 seconds:
- #29. Read current Spike to be analysed
- #54 while SpikeHistoric has new daily Spike:
- #62. Predict Randon Forest for original spike
- #65. Predict K Nearest Neighbors for original spike
- #72. Predict Multiple Linear Regression for original spike
- #### SECOND LEVEL PREDICTION
- #83####### random Forest ###### 8
- #84. Define Second Spike
- #98. Predict Random Forest, Second Level Prediction
- #105 #### Knearest ########
- #107. Define Second Spike
- #111. Predict K Nearest Neighbors, Second Level Prediction
- #116##### MLRG #######
- #119. Define Second Spike
- #122. Predict Multiple Linear Regression, Second Level Prediction
- #178. We are going to see if the predition we have just calculated are better than any of them for some spike in the patterns DF.
- #180 for each spike in patterns: #180
- #191 if current spike trend is UP
- #194 if current spike's 3 predictions are greater than some spike in patterns with code 34/35 & its average
- #226 INVEST1="UP34"; else: "PU34"
- #255 INVEST1="UP35"; else: "PU35"
- #261 if current spike's 3 predictions are lower than some spike in patterns with code 40/43 & its average
- #293 INVEST1="DW40"; else: "WD40"
- #322 INVEST1="DW43"; else: "WD43"
- #328 if current spike's 2 predictions are greater than some spike in patterns with code 34/35 & its average
- #351 INVEST1="UPFK34"; else: "PUFK34"
- #372 INVEST1="UPFK35"; else: "PUFK35"
- #399 INVEST1="UPFM34"; else: "PUFM34"
- #420 INVEST1="UPFM35"; else: "PUFM35"
- #447 INVEST1="UPKM34"; else: "PUKM34"
- #468 INVEST1="UPKM35"; else: "PUKM35"
- #474 if current spike's 2 predictions are lower than some spike in patterns with code 40/43 & its average
- #495 INVEST1="DWFK40"; else: "WDFK40"

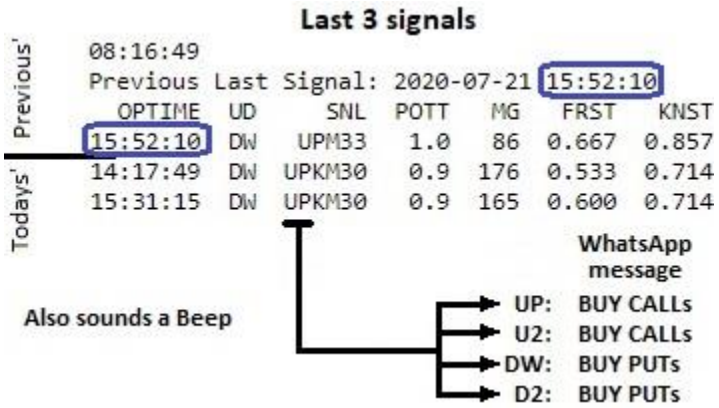
- #521 INVEST1="DWFK43"; else: "WDFK43"
- #542 INVEST1="DWFM40"; else: "WDFM40"
- #563 INVEST1="DWFM43"; else: "WDFM43"
- #589 INVEST1="DWKM40"; else: "WDKM40"
- #610 INVEST1="DWKM43"; else: "WDKM43"
- #616 if current spike's 1 prediction are greater than some spike in patterns with code 34/35 & its average
- #633 INVEST1="UPF34"; else: "PUF34"
- #648 INVEST1="UPF35"; else: "PUF35"
- #670 INVEST1="UPK34"; else: "PUK34"
- #685 INVEST1="UPK35"; else: "PUK35"
- #707 INVEST1="UPM34"; else: "PUM34"
- #722 INVEST1="UPM35"; else: "PUM35"
- #728 if current spike's 1 prediction are lower than some spike in patterns with code 40/43 & its average
- #743 INVEST1="DWF40"; else: "WDF40"
- #758 INVEST1="DWF43"; else: "WDF43"
- #779 INVEST1="DWK40"; else: "WDK40"
- #794 INVEST1="DWK43"; else: "WDK43"
- #815 INVEST1="DWM40"; else: "WDM40"
- #830 INVEST1="DWM43"; else: "WDM43"
- #836 if current spike trend is DWON
- #845 if current spike's 3 predictions are greater than some spike in patterns with code 30/33 & its average
- #878 INVEST1="UP30"; else: "PU30"
- #910 INVEST1="UP33"; else: "PU33"
- #930 if current spike's 3 predictions are lower than some spike in patterns with code 44/45 & its average
- #949 INVEST1="DW44"; else: "WD44"
- #978 INVEST1="DW45"; else: "WD45"
- #1000 if current spike's 2 predictions are greater than some spike in patterns with code 30/33 & its average
- #1008 INVEST1="UPFK30"; else: "PUFK30"
- #1031 INVEST1="UPFK33"; else: "PUFK33"
- #1062 INVEST1="UPFM30"; else: "PUFM30"
- #1098 INVEST1="UPFM33"; else: "PUFM33"
- #1121 INVEST1="UPKM30"; else: "PUKM30"
- #1144 INVEST1="UPKM33"; else: "PUKM33"
- #1152 if current spike's 2 predictions are lower than some spike in patterns with code 44/45 & its average
- #1176 INVEST1="DWFK44"; else: "WDFK44"
- #1196 INVEST1="DWFK45"; else: "WDFK45"
- #1226 INVEST1="DWFM44"; else: "WDFM44"
- #1247 INVEST1="DWFM45"; else: "WDFM45"
- #1274 INVEST1="DWKM44"; else: "WDKM44"
- #1295 INVEST1="DWKM45"; else: "WDKM45"

- #1302 ## FIRST DOWN ONE CONDITION 30/33 ### 1302
- #1305 if current spike's 1 prediction are greater than some spike in patterns with code 30/33 & its average
- #1321 INVEST1="UPF30"; else: "PUF30"
- #1338 INVEST1="UPF33"; else: "PUF33"
- #1363 INVEST1="UPK30"; else: "PUK30"
- #1379 INVEST1="UPK33"; else: "PUK33"
- #1405 INVEST1="UPM30"; else: "PUM30"
- #1422 INVEST1="UPM33"; else: "PUM33"
- #1425 if current spike's 1 prediction are lower than some spike in patterns with code 44/45 & its average
- #1449 INVEST1="DWF44"; else: "WDF44"
- #1453 INVEST1="DWF45"; else: "WDF45"
- #1485 INVEST1="DWK44"; else: "WDK44"
- #1580 INVEST1="DWK45"; else: "WDK45"
- #1522 INVEST1="DWM44": else: "WDM44"
- #1537 INVEST1="DWM45"; else: "WDM45"
- #1546 if new S E C O N D spike trend is UP
- #1548 if current spike's 3 predictions are greater than some spike in patterns with code 34/35 & its average
- #1593 INVEST2="U234"; else: "P234"
- #1619 INVEST2="U235"; else: "P235"
- #1622 ##### SECOND UP THREE CONDITION 40/43 #######
- #1650 INVEST2="D240"; else: "W240"
- #1677 INVEST2="D243"; else: "W243"
- #1684 ##### SECOND UP TWO CONDITION ####### 1684
- #1686 ##### SECOND TWO CONDITION UP 34/35 ####### 1686
- #1717 INVEST2="U2FK34"; else: "P2FK34"
- #1736 INVEST2="U2FK35"; else: "P2FK35"
- #1770 INVEST2="U2FM34"; else: "PEFM34"
- #1789 INVEST2="U2FM35"; else: "P2FM35"
- #1822 INVEST2="U2KM34"; else: "P2KM34"
- #1841 INVEST2="U2KM35"; else: "P2KM35"
- #1849 ##### SECOND TWO CONDITION UP 40/43 ####### 1849
- #1870 INVEST2="D2FK40"; else: "W2FK40"
- #1890 INVEST2="D2FK43"; else: "W2FK43"
- #1915 INVEST2="D2FM40"; else: "W2FM40"
- #1935 INVEST2="D2FM43"; else: "W2FM43"
- #1960 INVEST2="D2KM40"; else: "W2KM40"
- #1980 INVEST2="D2KM43"; else: "W2KM43"
- #1989 ##### SECOND UP ONE CONDITION 34/35 & 40/43 ####### 1989
- #2015 INVEST2="U2F34"; else: "P2F34"
- #2029 INVEST2="U2F35"; else: "PEF35"
- #2055 INVEST2="U2K34"; else: "P2K34"
- #2060 INVEST2="U2K35"; else: "P2K35"
- #2096 INVEST2="U2M34"; else: "P2M34"

- #2110 INVEST2="U2M35"; else: "P2M35"
- #2117 ## elif < f 40/43 2117
- #2132 INVEST2="D2F40"; else: "W2F40"
- #2147 INVEST2="D2F43"; else: "W2F43"
- #2166 INVEST2="D2K40"; else: "W2K40"
- #2181 INVEST2="D2K43"; else: "W2K43"
- #2200 INVEST2="D2M40"; else: "W2M40"
- #2215 INVEST2="D2M43"; else: "W2M43"
- #2222 if new S E C O N D spike trend is DOWN
- #2224 if current spike's 3 predictions are greater than some spike in patterns with code 30/33 & its average
- #2254 INVEST2="U230"; else: "P230"
- #2283 INVEST2="U233"; else: "P233"
- #2290 if current spike's 3 predictions are lower than some spike in patterns with code 44/45 & its average
- #2316 INVEST2="D244"; else: "W244"
- #2342 INVEST2="D245"; else: "W245"
- #2348 ##### SECOND TWO CONDITION DOWN ####### 2348
- #2350 if current spike's 2 predictions are greater than some spike in patterns with code 30/33 & its average
- #2374 INVEST2="U2FK30"; else: "P2FK30"
- #2394 INVEST2="U2FK33"; else: "P2FK33"
- #2422 INVEST2="U2FM30"; else: "P2FM30"
- #2445 INVEST2="U2FM33"; else: "P2FM33"
- #2476 INVEST2="U2KM30"; else: "P2KM30"
- #2496 INVEST2="U2KM33"; else: "P2KM33"
- #2504 if current spike's 2 predictions are lower than some spike in patterns with code 44/45 & its average
- #2526 INVEST2="D2FK44"; else: "W2FK44"
- #2545 INVEST2="D2FK45"; else: "W2FK45"
- #2570 INVEST2="D2FM44"; else: "W2FM44"
- #2589 INVEST2="D2FM45"; else: "W2FM45"
- #2614 INVEST2="D2KM44"; else: "W2KM44"
- #2633 INVEST2="D2KM45"; else: "W2KM45"
- #2640 if current spike's 1 prediction are greater than some spike in patterns with code 30/33 & its average
- #2659 INVEST2="U2F30"; else: "P2F30"
- #2674 INVEST2="U2F33"; else: "P2F33"
- #2696 INVEST2="U2K30"; else: "P2K30"
- #2711 INVEST2="U2K33"; else: "P2K33"
- #2732 INVEST2="U2M30"; else: "P2M30"
- #2747 INVEST2="U2M33"; else: "P2M33"
- #2757 if current spike's 1 prediction are lower than some spike in patterns with code 44/45 & its average
- #2770 INVEST2="D2F44"; else: "W2F44"
- #2784 INVEST2="D2F45"; else: "W2F45"

- #2804 INVEST2="D2M44"; else: "W2M44"
- #2818 INVEST2="D2K45"; else: "W2K45"
- #2838 INVEST2="D2M44"; else: "W2M44"
- #2852 INVEST2="D2M45"; else: "W2M45"
- #2858 ##### O P E N F I R S T ###### 2858
- #2902 if end of last FIRST signal == 30/33 & ends of previous last FIRST signal == 34/35:
- append spike & signalcode to signals DF
- send whatsapp "BUY CALLs"
- Beep
- #3010 if end of last FIRST signal == 40/43 & ends of previous last FIRST signal == 44/45:
- append spike & signalcode to signals DF
- send whatsapp "BUY PUTs"
- Beep
- #3104 ############################## C L O S I N G F I R S T
- #3105 When takeprofit or stoploss SPY values are reached, close spike row in signals DF
- #3140 ##### O P E N S E C O N D ######
- #3181 if end of last SECOND signal == 30/33 & ends of previous last SECOND signal == 34/35:
- append spike & signalcode to signals DF
- send whatsapp "BUY CALLs"
- Beep
- #3288 if end of last SECOND signal == 40/43 & ends of previous last SECOND signal == 44/45:
- append spike & signalcode to signals DF
- send whatsapp "BUY PUTs"
- Beep
- #3395 ############################## C L O S I N G S E C O N D
- #3396 When takeprofit or stoploss SPY values are reached, close spike row in signals DF
- #3449 print(signals_final)
- #3486 print("CLOSED")
- #3487 print("Close and Save signals")
- #3487 End of Operation

5.11. Output



6. Contact

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