

# Het backtesten van een TA - strategie

VFB -Technische Analysedag – 7 maart 2020

Dirk Arens



[Gerd Altmann](#) via [Pixabay](#)

# Het plan van aanpak



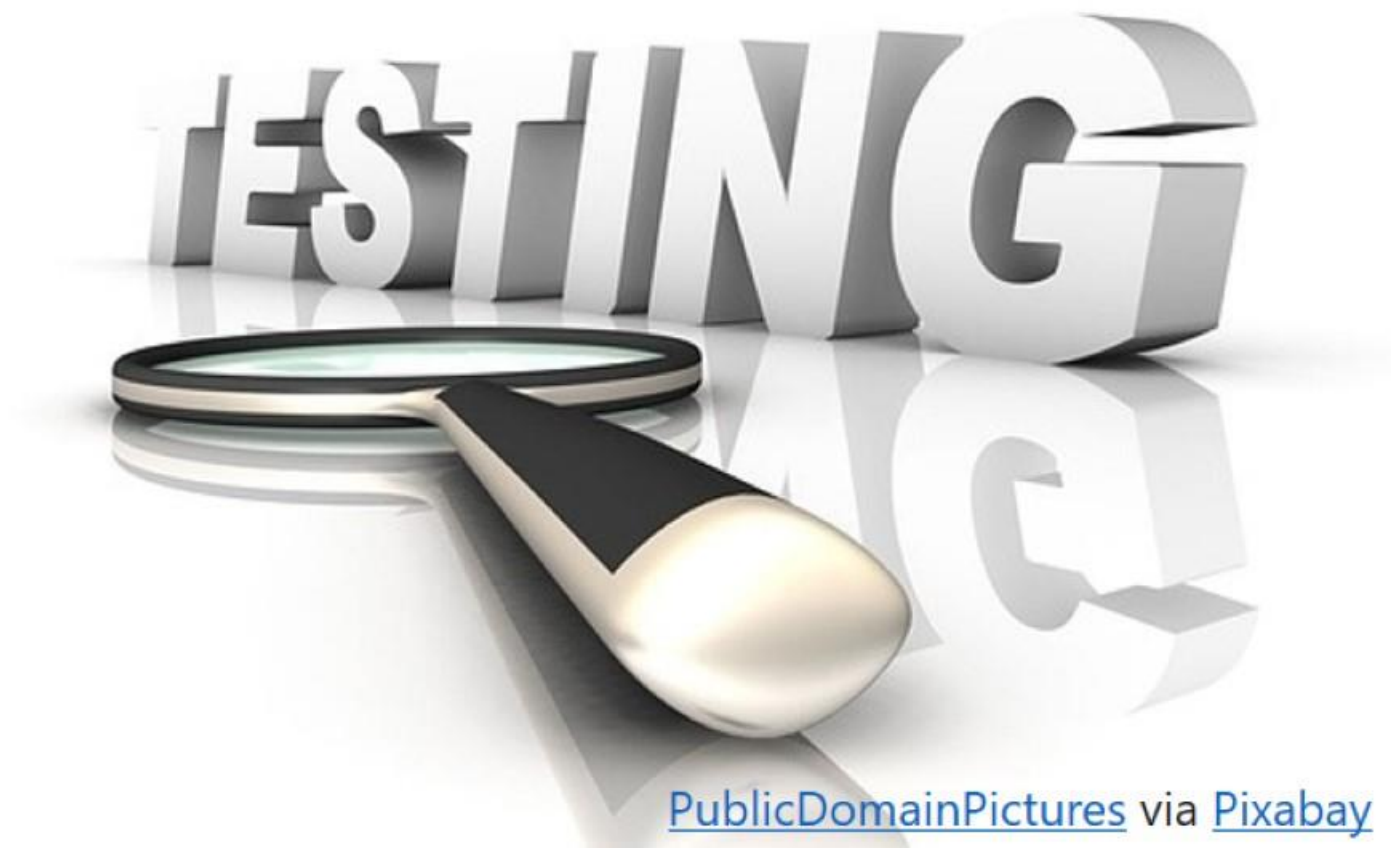
Plan is zoals  
een recept



Meten is  
weten



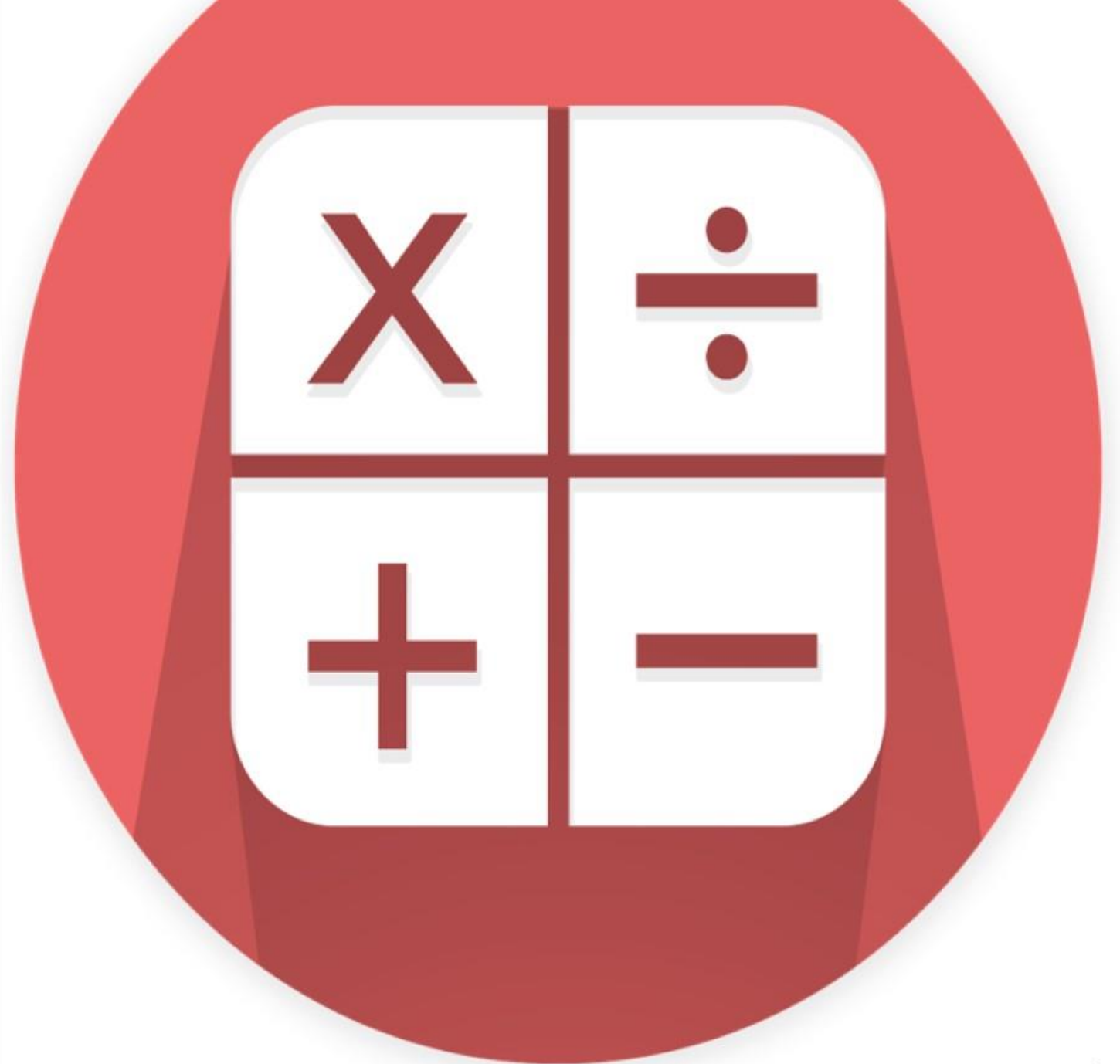
# Backtesten



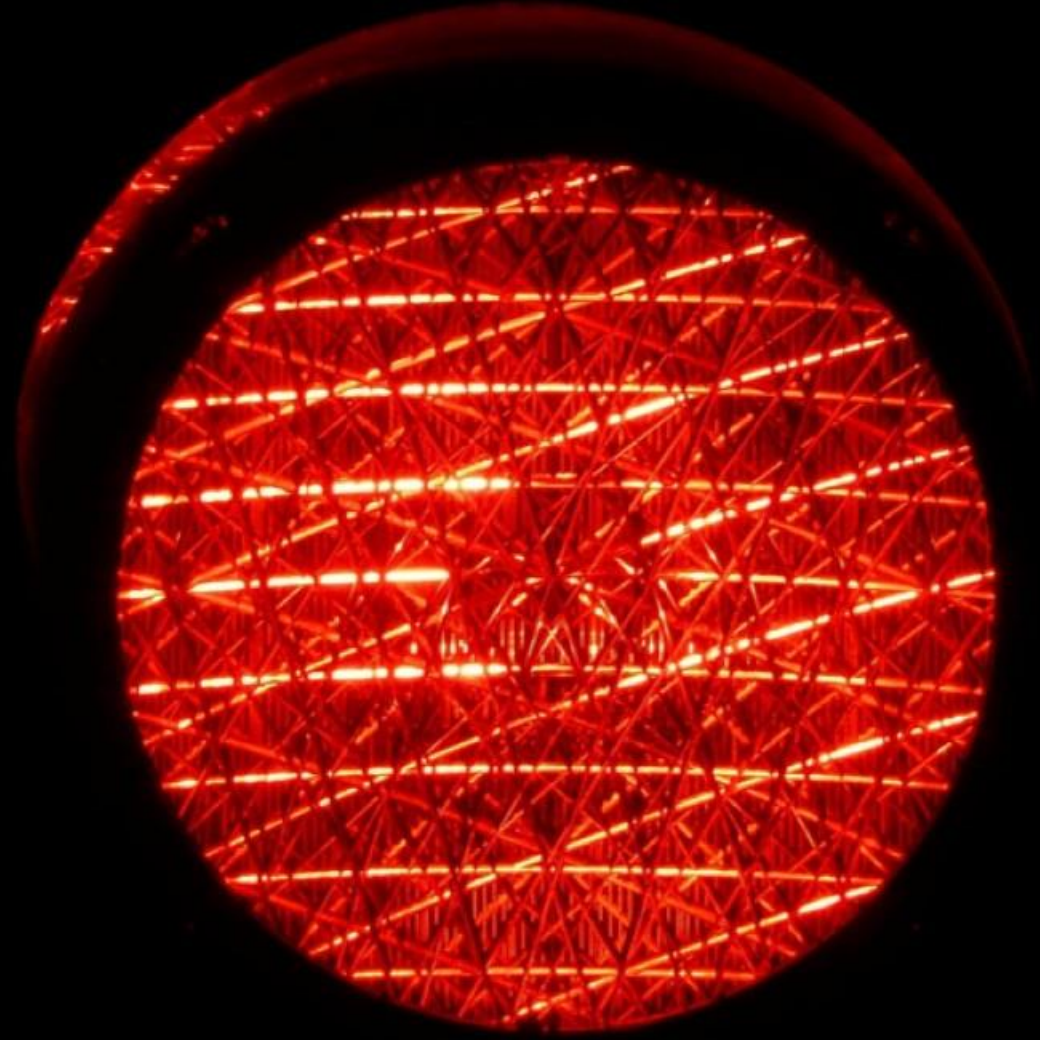
TA als een  
“timing tool”



# Indicatoren



No go!



Eenmaal  
allemaal  
groen:

Go!



Risico  
management

Stop Loss



Statistisch  
redeneren

10%

50%

25%

80%



Position  
Sizing

Money  
management



# Grafische voorstelling



# Data

|    |           |         |         |         |         |         |          |
|----|-----------|---------|---------|---------|---------|---------|----------|
| 4  | 7/31/2018 | 1653.57 | 1675.65 | 1653.57 | 1670.8  | 1670.8  | 38921000 |
| 5  | 8/1/2018  | 1670.87 | 1673.23 | 1657.54 | 1669.26 | 1669.26 | 34969900 |
| 6  | 8/2/2018  | 1668.99 | 1682.3  | 1662.33 | 1682.1  | 1682.1  | 34673800 |
| 7  | 8/3/2018  | 1682.08 | 1687.3  | 1668.35 | 1673.37 | 1673.37 | 30303900 |
| 8  | 8/6/2018  | 1673.25 | 1684.8  | 1671.99 | 1684.31 | 1684.31 | 28745400 |
| 9  | 8/7/2018  | 1684.86 | 1694.36 | 1684.86 | 1688.3  | 1688.3  | 31627700 |
| 10 | 8/8/2018  | 1688.68 | 1689.34 | 1677.67 | 1686.88 | 1686.88 | 29722000 |
| 11 | 8/9/2018  | 1687.05 | 1696.75 | 1686.43 | 1690.89 | 1690.89 | 30470500 |
| 12 | 8/10/2018 | 1689.32 | 1695.79 | 1680.77 | 1686.8  | 1686.8  | 32560400 |
| 13 | 8/13/2018 | 1686.81 | 1689.1  | 1670.62 | 1675.32 | 1675.32 | 31584500 |
| 14 | 8/14/2018 | 1676.19 | 1694.96 | 1676.19 | 1692.58 | 1692.58 | 29769700 |
| 15 | 8/15/2018 | 1691.6  | 1691.6  | 1663.53 | 1670.67 | 1670.67 | 36450700 |
| 16 | 8/16/2018 | 1691.6  | 1691.6  | 1663.53 | 1685.75 | 1685.75 | 32198800 |
| 17 | 8/17/2018 | 1685.45 | 1693.71 | 1679.97 | 1692.95 | 1692.95 | 30241000 |
| 18 | 8/20/2018 | 1693.79 | 1701.13 | 1690.18 | 1698.69 | 1698.69 | 27480200 |
| 19 | 8/21/2018 | 1698.91 | 1722.29 | 1698.91 | 1718.05 | 1718.05 | 31471400 |
| 20 | 8/22/2018 | 1717.75 | 1723.01 | 1715.8  | 1722.54 | 1722.54 | 26895600 |
| 21 | 8/23/2018 | 1722.3  | 1723.41 | 1712.92 | 1717.05 | 1717.05 | 27139100 |
| 22 | 8/24/2018 | 1718.36 | 1726.97 | 1718.36 | 1725.67 | 1725.67 | 25961900 |
| 23 | 8/27/2018 | 1727.33 | 1737.63 | 1727.33 | 1728.41 | 1728.41 | 28540800 |
| 24 | 8/28/2018 | 1729.07 | 1733.45 | 1722.36 | 1728.42 | 1728.42 | 26831900 |
| 25 | 8/29/2018 | 1729.05 | 1737.02 | 1724.73 | 1734.75 | 1734.75 | 27918600 |

U.S. Markets open in 4 hrs 16 mins

|         |                                 |                                                                                                                                     |                                                                                     |
|---------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Telenet |                                 | ×                                                                                                                                   |  |
| Symbols |                                 |  <a href="#"> Screener for stocks &amp; more</a> |                                                                                     |
| TNET.BR | Telenet Group Holding NV        | Equity - BRU                                                                                                                        |                                                                                     |
| TLGHY   | Telenet Group Holding NV        | Equity - PNK                                                                                                                        |                                                                                     |
| TLGHF   | Telenet Group Holding NV        | Equity - PNK                                                                                                                        |                                                                                     |
| TNET.VI | Telenet Group Holding NV        | Equity - VIE                                                                                                                        |                                                                                     |
| T4I.BE  | TELENET GROUP HOLDING NV        | Equity - BER                                                                                                                        |                                                                                     |
| T4I.SG  | Telenet Group Holding N.V. Acti | Equity - STU                                                                                                                        |                                                                                     |



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S&P Futures

**3,053.50**  
-61.25 (-1.97%)



Dow Futures

**26,462.00**  
-503.00 (-1.87%)



Nasdaq Futures

**8,722.00**  
-174.50 (-1.96%)



Russell 2000

**1,531.20**  
+45.11 (+3.04%)



Crude Oil

**46.94**  
+0.16 (+0.34%)



## Telenet Group Holding NV (TNET.BR)

Brussels - Brussels Delayed Price. Currency in EUR

Add to watchlist

**35.16** -0.80 (-2.22%)

As of 1:55PM CET. Market open.

Summary

[Chart](#)

[Conversations](#)

[Statistics](#)

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[Financials](#)

[Analysis](#)

[Options](#)

[Holders](#)

[Sustainability](#)

|                |          |                   |        |
|----------------|----------|-------------------|--------|
| Previous Close | 35.96    | Market Cap        | 4.031B |
| Open           | 36.28    | Beta (5Y Monthly) | 0.47   |
| Bid            | 0.00 x 0 | PE Ratio (TTM)    | 16.51  |

[1D](#) [5D](#) [1M](#) [6M](#) [YTD](#) [1Y](#) [5Y](#) [Max](#) [Full screen](#)





S&P Futures

**3,052.75**  
-62.00 (-1.99%)



Dow Futures

**26,452.00**  
-513.00 (-1.90%)



Nasdaq Futures

**8,721.00**  
-175.50 (-1.97%)



Russell 2000

**1,531.20**  
+45.11 (+3.04%)



Crude Oil

**46.94**  
+0.16 (+0.34%)



**Telenet Group Holding NV (TNET.BR)**

Brussels - Brussels Delayed Price. Currency in EUR

★ Add to watchlist

**35.12** -0.84 (-2.34%)

As of 1:57PM CET. Market open.

Summary

Chart

Conversations

Statistics

**Historical Data**

Profile

Financials

Analysis

Options

Holders

Sustainability

Time Period: Mar 05, 2019 - Mar 05, 2020 ▾

Show: Historical Prices ▾

Frequency: Daily ▾

Apply

Currency in EUR

Date

Mar 05, 2020

Mar 03, 2020

Mar 02, 2020

Feb 28, 2020

1D

5D

3M

6M

YTD

1Y

5Y

Max

Start Date

05/03/2019

End Date

05/03/2020

Done

Cancel

Download Data

gh

Low

Close\*

Adj Close\*\*

Volume

0

35.12

35.16

35.16

98,229

0

34.44

34.58

34.58

420,822

2

33.76

34.04

34.04

470,737

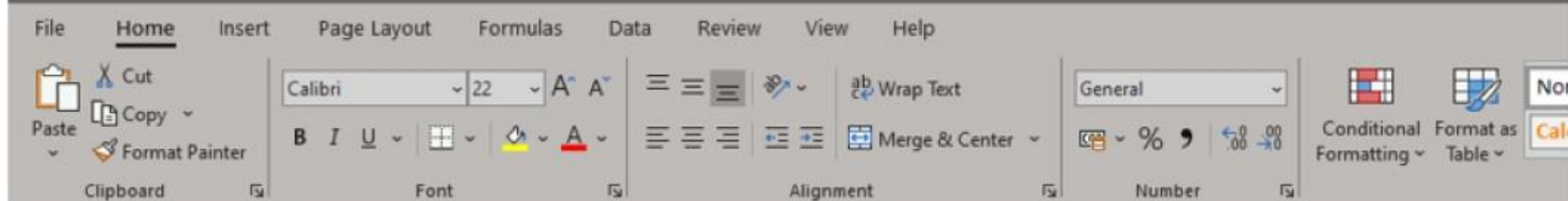
2

33.50

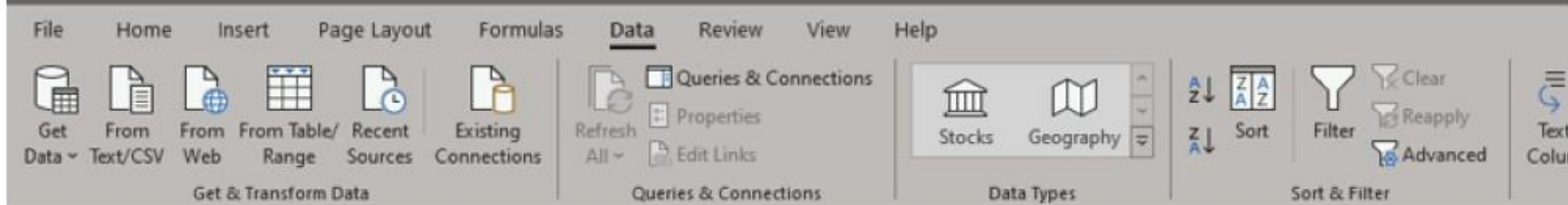
34.52

34.52

601,306



|    | A                                         | B         | C         | D         | E         | F         | G      | H | I | J | K | L | M | N | O |
|----|-------------------------------------------|-----------|-----------|-----------|-----------|-----------|--------|---|---|---|---|---|---|---|---|
| 1  | Date,Open,High,Low,Close,Adj Close,Volume |           |           |           |           |           |        |   |   |   |   |   |   |   |   |
| 2  | 2019-03-05                                | 40.320000 | 40.560001 | 39.680000 | 40.259998 | 39.686867 | 212840 |   |   |   |   |   |   |   |   |
| 3  | 2019-03-06                                | 40.259998 | 40.560001 | 39.959999 | 40.360001 | 39.785446 | 284135 |   |   |   |   |   |   |   |   |
| 4  | 2019-03-07                                | 40.340000 | 40.560001 | 39.639999 | 39.919998 | 39.351707 | 257090 |   |   |   |   |   |   |   |   |
| 5  | 2019-03-08                                | 39.700001 | 40.459999 | 39.480000 | 40.419998 | 39.844589 | 193069 |   |   |   |   |   |   |   |   |
| 6  | 2019-03-11                                | 40.380001 | 40.900002 | 40.299999 | 40.480000 | 39.903736 | 179714 |   |   |   |   |   |   |   |   |
| 7  | 2019-03-12                                | 40.500000 | 40.820000 | 40.240002 | 40.599998 | 40.022026 | 204436 |   |   |   |   |   |   |   |   |
| 8  | 2019-03-13                                | 40.799999 | 41.299999 | 40.459999 | 41.139999 | 40.554340 | 154626 |   |   |   |   |   |   |   |   |
| 9  | 2019-03-14                                | 41.320000 | 41.779999 | 41.259998 | 41.580002 | 40.988079 | 201806 |   |   |   |   |   |   |   |   |
| 10 | 2019-03-15                                | 41.500000 | 42.500000 | 41.500000 | 42.220001 | 41.618969 | 265358 |   |   |   |   |   |   |   |   |
| 11 | 2019-03-18                                | 41.900002 | 43.040001 | 41.820000 | 42.660000 | 42.052704 | 185378 |   |   |   |   |   |   |   |   |
| 12 | 2019-03-19                                | 42.660000 | 43.480000 | 42.660000 | 42.880001 | 42.269573 | 180035 |   |   |   |   |   |   |   |   |
| 13 | 2019-03-20                                | 42.759998 | 43.160000 | 42.619999 | 42.619999 | 42.013271 | 152425 |   |   |   |   |   |   |   |   |
| 14 | 2019-03-21                                | 42.500000 | 43.060001 | 42.320000 | 42.900002 | 42.289288 | 218968 |   |   |   |   |   |   |   |   |
| 15 | 2019-03-22                                | 43.099998 | 43.279999 | 42.360001 | 42.400002 | 41.796406 | 193634 |   |   |   |   |   |   |   |   |
| 16 | 2019-03-25                                | 42.119999 | 42.380001 | 41.840000 | 42.000000 | 41.402100 | 121079 |   |   |   |   |   |   |   |   |
| 17 | 2019-03-26                                | 41.820000 | 42.840000 | 41.820000 | 42.619999 | 42.013271 | 163579 |   |   |   |   |   |   |   |   |



| Date,Open,High,Low,Close,Adj Close,Volume |                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------------------------|------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 1                                         | Date,Open,High,Low,Close,Adj Close,Volume                              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2                                         | 2019-03-05,40.320000,40.560001,39.680000,40.259998,39.686867,212840    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3                                         | 2019-03-06,40.259998,40.560001,39.959999,40.360001,39.785446,284135    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4                                         | 2019-03-07,40.340000,40.560001,39.639999,39.919998,39.351707,257090    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5                                         | 2019-03-08,39.700001,40.459999,39.480000,40.419998,39.844589,193069    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6                                         | 2019-03-11,40.380001,40.900002,40.299999,40.480000,39.903736,179714    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7                                         | 2019-03-12,40.500000,40.900002,40.299999,40.480000,39.903736,179714    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8                                         | 2019-03-13,40.799999,41.320000,41.500000,42.500000,43.099998,43.540001 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9                                         | 2019-03-14,41.320000,41.500000,42.500000,43.099998,43.540001,42.400002 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10                                        | 2019-03-15,41.500000,42.500000,43.099998,43.540001,42.400002,42.900002 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11                                        | 2019-03-18,41.900002,43.099998,43.540001,42.400002,42.900002,42.289288 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12                                        | 2019-03-19,42.660000,43.099998,43.540001,42.400002,42.900002,42.289288 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 13                                        | 2019-03-20,42.759998,43.099998,43.540001,42.400002,42.900002,42.289288 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 14                                        | 2019-03-21,42.500000,43.099998,43.540001,42.400002,42.900002,42.289288 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 15                                        | 2019-03-22,43.099998,43.540001,42.400002,42.900002,42.289288,260428    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16                                        | 2019-03-25,42.119999,42.900002,42.289288,260428,260428,260428          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 17                                        | 2019-03-26,41.820000,42.900002,42.289288,260428,260428,260428          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18                                        | 2019-03-27,42.639999,43.540001,42.400002,42.900002,42.289288,260428    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Convert Text to Columns Wizard - Step 1 of 3

The Text Wizard has determined that your data is Delimited.  
If this is correct, choose Next, or choose the data type that best describes your data.

Original data type

Choose the file type that best describes your data:

☒ Delimited - Characters such as commas or tabs separate each field.

☐ Fixed width - Fields are aligned in columns with spaces between each field.

Preview of selected data:

|   |                                                                     |
|---|---------------------------------------------------------------------|
| 1 | Date,Open,High,Low,Close,Adj Close,Volume                           |
| 2 | 2019-03-05,40.320000,40.560001,39.680000,40.259998,39.686867,212840 |
| 3 | 2019-03-06,40.259998,40.560001,39.959999,40.360001,39.785446,284135 |
| 4 | 2019-03-07,40.340000,40.560001,39.639999,39.919998,39.351707,257090 |
| 5 | 2019-03-08,39.700001,40.459999,39.480000,40.419998,39.844589,193069 |
| 6 | 2019-03-11,40.380001,40.900002,40.299999,40.480000,39.903736,179714 |

Buttons: Cancel, < Back, Next >, Finish

1 If this is correct, choose Next, or choose the data type that best describes your data.

## Original data type

Choose the file type that best describes your data:

- ☒ Delimited - Characters such as commas or tabs separate each field.
- ☐ Fixed width - Fields are aligned in columns with spaces between each field.

## Preview of selected data:

|   |                                                                           |
|---|---------------------------------------------------------------------------|
| 1 | Date, Open, High, Low, Close, Adj Close, Volume                           |
| 2 | 2019-03-05, 40.320000, 40.560001, 39.680000, 40.259998, 39.686867, 212840 |
| 3 | 2019-03-06, 40.259998, 40.560001, 39.959999, 40.360001, 39.785446, 284135 |
| 4 | 2019-03-07, 40.340000, 40.560001, 39.639999, 39.919998, 39.351707, 257090 |
| 5 | 2019-03-08, 39.700001, 40.459999, 39.480000, 40.419998, 39.844589, 193069 |
| 6 | 2019-03-11, 40.380001, 40.900002, 40.299999, 40.480000, 39.903736, 179714 |

Cancel

< Back

Next >

Finish

,40.900002,40.299999,40.480000,39.903736,179714

Convert Text to Columns Wizard - Step 2 of 3

This screen lets you set the delimiters your data contains. You can see how your text is affected in the preview below.

Delimiters

☒ Tab  
☐ Semicolon  
☒ Comma  
☐ Space  
☐ Other:

☐ Treat consecutive delimiters as one  
Text qualifier:

Data preview

| Date       | Open      | High      | Low       | Close     | Adj Close | Volume |
|------------|-----------|-----------|-----------|-----------|-----------|--------|
| 2019-03-05 | 40.320000 | 40.560001 | 39.680000 | 40.259998 | 39.686867 | 212840 |
| 2019-03-06 | 40.259998 | 40.560001 | 39.959999 | 40.360001 | 39.785446 | 284135 |
| 2019-03-07 | 40.340000 | 40.560001 | 39.639999 | 39.919998 | 39.351707 | 257090 |
| 2019-03-08 | 39.700001 | 40.459999 | 39.480000 | 40.419998 | 39.844589 | 193069 |
| 2019-03-11 | 40.380001 | 40.900002 | 40.299999 | 40.480000 | 39.903736 | 179714 |

Cancel

< Back

Next >

Finish

,43.540001,42.400002,42.900002,42.289288,260428

FileHomeInsertPage LayoutFormulasDataReviewViewHelp

Get Data

From Text/CSV

From Web

From Table/Range

Recent Sources

Existing Connections

Get & Transform Data

Refresh All

Queries & Connections

Properties

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Queries & Connections

Stocks

Geography

Data Types

Sort

Filter

Advanced

Sort & Filter

Text to Columns

Flash Fill

Remove Duplicates

J10

|    | A          | B         | C         | D         | E         | F         | G      | H |
|----|------------|-----------|-----------|-----------|-----------|-----------|--------|---|
| 1  | Date       | Open      | High      | Low       | Close     | Adj Close | Volume |   |
| 2  | 5/03/2019  | 40.32     | 40.560001 | 39.68     | 40.259998 | 39.686867 | 212840 |   |
| 3  | 6/03/2019  | 40.259998 | 40.560001 | 39.959999 | 40.360001 | 39.785446 | 284135 |   |
| 4  | 7/03/2019  | 40.34     | 40.560001 | 39.639999 | 39.919998 | 39.351707 | 257090 |   |
| 5  | 8/03/2019  | 39.700001 | 40.459999 | 39.48     | 40.419998 | 39.844589 | 193069 |   |
| 6  | 11/03/2019 | 40.380001 | 40.900002 | 40.299999 | 40.48     | 39.903736 | 179714 |   |
| 7  | 12/03/2019 | 40.5      | 40.82     | 40.240002 | 40.599998 | 40.022026 | 204436 |   |
| 8  | 13/03/2019 | 40.799999 | 41.299999 | 40.459999 | 41.139999 | 40.55434  | 154626 |   |
| 9  | 14/03/2019 | 41.32     | 41.779999 | 41.259998 | 41.580002 | 40.988079 | 201806 |   |
| 10 | 15/03/2019 | 41.5      | 42.5      | 41.5      | 42.220001 | 41.618969 | 265358 |   |
| 11 | 18/03/2019 | 41.900002 | 43.040001 | 41.82     | 42.66     | 42.052704 | 185378 |   |
| 12 | 19/03/2019 | 42.66     | 43.48     | 42.66     | 42.880001 | 42.269573 | 180035 |   |
| 13 | 20/03/2019 | 42.759998 | 43.16     | 42.619999 | 42.619999 | 42.013271 | 152425 |   |
| 14 | 21/03/2019 | 42.5      | 43.060001 | 42.32     | 42.900002 | 42.289288 | 218968 |   |
| 15 | 22/03/2019 | 43.099998 | 43.279999 | 42.360001 | 42.400002 | 41.796406 | 193634 |   |
| 16 | 25/03/2019 | 42.119999 | 42.380001 | 41.84     | 42        | 41.4021   | 121079 |   |
| 17 | 26/03/2019 | 41.82     | 42.84     | 41.82     | 42.619999 | 42.013271 | 163579 |   |
| 18 | 27/03/2019 | 42.639999 | 43.540001 | 42.400002 | 42.900002 | 42.289288 | 260428 |   |

| <div> <div>FileHomeInsertPage LayoutFormulasDataReviewViewHelp</div> <div> <div> <div>Cut</div> <div>Copy</div> <div>Format Painter</div> </div> <div> <div>Calibri</div> <div>22</div> <div>A<sup>+</sup></div> <div>A<sup>-</sup></div> <div>B</div> <div>I</div> <div>U</div> <div></div> <div></div> <div></div> </div> <div> <div>Wrap Text</div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> <div> <div>General</div> <div></div> <div>%</div> <div></div> <div></div> <div></div> </div> <div> <div>Normal</div> <div>Bad</div> <div>Calculation</div> <div>Che</div> </div> </div> <div>ClipboardFontAlignmentNumber</div> </div> |            |       |       |       |       |           |        |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|-------|-------|-------|-----------|--------|---|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | A          | B     | C     | D     | E     | F         | G      | H |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Date       | Open  | High  | Low   | Close | Adj Close | Volume |   |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5/03/2019  | 40.32 | 40.56 | 39.68 | 40.26 | 39.69     | 212840 |   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6/03/2019  | 40.26 | 40.56 | 39.96 | 40.36 | 39.79     | 284135 |   |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 7/03/2019  | 40.34 | 40.56 | 39.64 | 39.92 | 39.35     | 257090 |   |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 8/03/2019  | 39.70 | 40.46 | 39.48 | 40.42 | 39.84     | 193069 |   |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11/03/2019 | 40.38 | 40.90 | 40.30 | 40.48 | 39.90     | 179714 |   |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 12/03/2019 | 40.50 | 40.82 | 40.24 | 40.60 | 40.02     | 204436 |   |
| 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13/03/2019 | 40.80 | 41.30 | 40.46 | 41.14 | 40.55     | 154626 |   |
| 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 14/03/2019 | 41.32 | 41.78 | 41.26 | 41.58 | 40.99     | 201806 |   |
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 15/03/2019 | 41.50 | 42.50 | 41.50 | 42.22 | 41.62     | 265358 |   |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 18/03/2019 | 41.90 | 43.04 | 41.82 | 42.66 | 42.05     | 185378 |   |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 19/03/2019 | 42.66 | 43.48 | 42.66 | 42.88 | 42.27     | 180035 |   |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 20/03/2019 | 42.76 | 43.16 | 42.62 | 42.62 | 42.01     | 152425 |   |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 21/03/2019 | 42.50 | 43.06 | 42.32 | 42.90 | 42.29     | 218968 |   |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 22/03/2019 | 43.10 | 43.28 | 42.36 | 42.40 | 41.80     | 193634 |   |
| 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 25/03/2019 | 42.12 | 42.38 | 41.84 | 42.00 | 41.40     | 121079 |   |
| 17                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 26/03/2019 | 41.82 | 42.84 | 41.82 | 42.62 | 42.01     | 163579 |   |
| 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 27/03/2019 | 42.64 | 43.54 | 42.40 | 42.90 | 42.29     | 260428 |   |
| 19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 28/03/2019 | 42.94 | 43.12 | 42.74 | 43.00 | 42.39     | 243390 |   |
| 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 29/03/2019 | 42.98 | 43.12 | 42.36 | 42.88 | 42.27     | 263102 |   |

# Indicator ATR

|    | A                        | B         | C     | D     | E     | F     | G          | H          | I    | J    | K | L |
|----|--------------------------|-----------|-------|-------|-------|-------|------------|------------|------|------|---|---|
| 1  |                          |           |       |       |       |       |            |            |      |      |   |   |
| 2  | Average True Range (ATR) |           |       |       |       |       |            |            |      |      |   |   |
| 3  |                          |           |       |       |       |       |            |            |      |      |   |   |
| 4  |                          |           | High  | Low   | Close | H - L | I H - Cp I | I L - Cp I | TR   | ATR  |   |   |
| 5  | 1-Apr-10                 |           | 48.70 | 47.79 | 48.16 | 0.91  |            |            | 0.91 |      |   |   |
| 6  | 5-Apr-10                 |           | 48.72 | 48.14 | 48.61 | 0.58  | 0.56       | 0.02       | 0.58 |      |   |   |
| 7  | 6-Apr-10                 |           | 48.90 | 48.39 | 48.75 | 0.51  | 0.29       | 0.22       | 0.51 |      |   |   |
| 8  | 7-Apr-10                 |           | 48.87 | 48.37 | 48.63 | 0.50  | 0.12       | 0.38       | 0.50 |      |   |   |
| 9  | 8-Apr-10                 |           | 48.82 | 48.24 | 48.74 | 0.58  | 0.19       | 0.39       | 0.58 |      |   |   |
| 10 | 9-Apr-10                 |           | 49.05 | 48.64 | 49.03 | 0.41  | 0.31       | 0.11       | 0.41 |      |   |   |
| 11 | 12-Apr-10                |           | 49.20 | 48.94 | 49.07 | 0.26  | 0.17       | 0.09       | 0.26 |      |   |   |
| 12 | 13-Apr-10                |           | 49.35 | 48.86 | 49.32 | 0.49  | 0.28       | 0.21       | 0.49 |      |   |   |
| 13 | 14-Apr-10                |           | 49.92 | 49.50 | 49.91 | 0.42  | 0.60       | 0.18       | 0.60 |      |   |   |
| 14 | 15-Apr-10                |           | 50.19 | 49.87 | 50.13 | 0.32  | 0.28       | 0.04       | 0.32 |      |   |   |
| 15 | 16-Apr-10                |           | 50.12 | 49.20 | 49.53 | 0.92  | 0.01       | 0.93       | 0.93 |      |   |   |
| 16 | 19-Apr-10                |           | 49.66 | 48.90 | 49.50 | 0.76  | 0.13       | 0.63       | 0.76 |      |   |   |
| 17 | 20-Apr-10                |           | 49.88 | 49.43 | 49.75 | 0.45  | 0.38       | 0.07       | 0.45 |      |   |   |
| 18 | 21-Apr-10                |           | 50.19 | 49.73 | 50.03 | 0.46  | 0.44       | 0.02       | 0.46 | 0.56 |   |   |
| 19 | 1                        | 22-Apr-10 | 50.36 | 49.26 | 50.31 | 1.10  | 0.33       | 0.77       | 1.10 | 0.59 |   |   |
| 20 | 2                        | 23-Apr-10 | 50.57 | 50.09 | 50.52 | 0.48  | 0.26       | 0.22       | 0.48 | 0.59 |   |   |
| 21 | 3                        | 26-Apr-10 | 50.65 | 50.30 | 50.41 | 0.35  | 0.13       | 0.22       | 0.35 | 0.57 |   |   |
| 22 | 4                        | 27-Apr-10 | 50.43 | 49.21 | 49.34 | 1.22  | 0.02       | 1.20       | 1.22 | 0.62 |   |   |
| 23 | 5                        | 28-Apr-10 | 49.63 | 48.98 | 49.37 | 0.65  | 0.29       | 0.36       | 0.65 | 0.62 |   |   |
| 24 | 6                        | 29-Apr-10 | 50.33 | 49.61 | 50.23 | 0.72  | 0.96       | 0.24       | 0.96 | 0.64 |   |   |
| 25 | 7                        | 30-Apr-10 | 50.29 | 49.20 | 49.24 | 1.09  | 0.06       | 1.03       | 1.09 | 0.67 |   |   |

# Average True Range (ATR)


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## Introduction

Developed by J. Welles Wilder, the Average True Range (ATR) is an indicator that measures volatility. As with most of his indicators, Wilder designed ATR with commodities and daily prices in mind. Commodities are frequently more volatile than stocks. They were are often subject to gaps and limit moves, which occur when a commodity opens up or down its maximum allowed move for the session. A volatility formula based only on the high-low range would fail to capture volatility from gap or limit moves.

### Outline

- [Average True Range \(ATR\)](#)
  - [Introduction](#)
  - [True Range](#)
  - [Calculation](#)
  - [Absolute ATR](#)
  - [Conclusion](#)
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  - [Suggested Scans](#)
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  - [Additional Resources](#)
    - [Stocks & Commodities Magazine Articles](#)

|    |           |       |       |       |      |      |      |      |      |
|----|-----------|-------|-------|-------|------|------|------|------|------|
| 1  | 22-Apr-10 | 50.50 | 49.20 | 50.51 | 1.10 | 0.55 | 0.77 | 1.10 | 0.55 |
| 2  | 23-Apr-10 | 50.57 | 50.09 | 50.52 | 0.48 | 0.26 | 0.22 | 0.48 | 0.59 |
| 3  | 26-Apr-10 | 50.65 | 50.30 | 50.41 | 0.35 | 0.13 | 0.22 | 0.35 | 0.57 |
| 4  | 27-Apr-10 | 50.43 | 49.21 | 49.34 | 1.22 | 0.02 | 1.20 | 1.22 | 0.62 |
| 5  | 28-Apr-10 | 49.63 | 48.98 | 49.37 | 0.65 | 0.29 | 0.36 | 0.65 | 0.62 |
| 6  | 29-Apr-10 | 50.33 | 49.61 | 50.23 | 0.72 | 0.96 | 0.24 | 0.96 | 0.64 |
| 7  | 30-Apr-10 | 50.29 | 49.20 | 49.24 | 1.09 | 0.06 | 1.03 | 1.09 | 0.67 |
| 8  | 03-May-10 | 50.17 | 49.43 | 49.93 | 0.74 | 0.93 | 0.19 | 0.93 | 0.69 |
| 9  | 04-May-10 | 49.32 | 48.08 | 48.43 | 1.24 | 0.61 | 1.85 | 1.85 | 0.78 |
| 10 | 05-May-10 | 48.50 | 47.64 | 48.18 | 0.86 | 0.07 | 0.79 | 0.86 | 0.78 |
| 11 | 06-May-10 | 48.32 | 41.55 | 46.57 | 6.77 | 0.14 | 6.63 | 6.77 | 1.21 |
| 12 | 07-May-10 | 46.80 | 44.28 | 45.41 | 2.52 | 0.23 | 2.29 | 2.52 | 1.30 |
| 13 | 10-May-10 | 47.80 | 47.31 | 47.77 | 0.49 | 2.39 | 1.90 | 2.39 | 1.38 |
| 14 | 11-May-10 | 48.39 | 47.20 | 47.72 | 1.19 | 0.62 | 0.57 | 1.19 | 1.37 |
| 15 | 12-May-10 | 48.66 | 47.90 | 48.62 | 0.76 | 0.94 | 0.18 | 0.94 | 1.34 |
| 16 | 13-May-10 | 48.79 | 47.73 | 47.85 | 1.06 | 0.17 | 0.89 | 1.06 | 1.32 |

[Click here for an Excel Spreadsheet](#) showing the start of an ATR calculation for QQQ.

In the spreadsheet example, the first True Range value (.91) equals the High minus the Low (yellow cells). The first 14-day ATR value (.56) was calculated by finding the average of the first 14 True Range values (blue cell). Subsequent ATR values were smoothed using the formula above. The spreadsheet values correspond with the yellow area on the chart below; notice how ATR surged as QQQ plunged in May with many long candlesticks.



File Home Insert Page Layout Formulas Data Review View Help

Paste Cut Copy Format Painter Clipboard

Arial 10 A A B I U Font

Wrap Text Merge & Center Alignment

Number % , .00 Number

K19  $\times$   $\checkmark$   $f_x$   $=(K18*13+J19)/14$

A B C D E F G H I J K L M

|    |   | High      | Low   | Close | H - L | H - Cp | L - Cp | TR   | ATR  |
|----|---|-----------|-------|-------|-------|--------|--------|------|------|
| 3  |   |           |       |       |       |        |        |      |      |
| 4  |   |           |       |       |       |        |        |      |      |
| 5  |   | 1/apr/10  | 48.70 | 47.79 | 48.16 | 0.91   |        | 0.91 |      |
| 6  |   | 5/apr/10  | 48.72 | 48.14 | 48.61 | 0.58   | 0.56   | 0.02 | 0.58 |
| 7  |   | 6/apr/10  | 48.90 | 48.39 | 48.75 | 0.51   | 0.29   | 0.22 | 0.51 |
| 8  |   | 7/apr/10  | 48.87 | 48.37 | 48.63 | 0.50   | 0.12   | 0.38 | 0.50 |
| 9  |   | 8/apr/10  | 48.82 | 48.24 | 48.74 | 0.58   | 0.19   | 0.39 | 0.58 |
| 10 |   | 9/apr/10  | 49.05 | 48.64 | 49.03 | 0.41   | 0.31   | 0.11 | 0.41 |
| 11 |   | 12/apr/10 | 49.20 | 48.94 | 49.07 | 0.26   | 0.17   | 0.09 | 0.26 |
| 12 |   | 13/apr/10 | 49.35 | 48.86 | 49.32 | 0.49   | 0.28   | 0.21 | 0.49 |
| 13 |   | 14/apr/10 | 49.92 | 49.50 | 49.91 | 0.42   | 0.60   | 0.18 | 0.60 |
| 14 |   | 15/apr/10 | 50.19 | 49.87 | 50.13 | 0.32   | 0.28   | 0.04 | 0.32 |
| 15 |   | 16/apr/10 | 50.12 | 49.20 | 49.53 | 0.92   | 0.01   | 0.93 | 0.93 |
| 16 |   | 19/apr/10 | 49.66 | 48.90 | 49.50 | 0.76   | 0.13   | 0.63 | 0.76 |
| 17 |   | 20/apr/10 | 49.88 | 49.43 | 49.75 | 0.45   | 0.38   | 0.07 | 0.45 |
| 18 |   | 21/apr/10 | 50.19 | 49.73 | 50.03 | 0.46   | 0.44   | 0.02 | 0.46 |
| 19 | 1 | 22/apr/10 | 50.36 | 49.26 | 50.31 | 1.10   | 0.33   | 0.77 | 1.10 |
| 20 | 2 | 23/apr/10 | 50.57 | 50.09 | 50.52 | 0.48   | 0.26   | 0.22 | 0.48 |
| 21 | 3 | 26/apr/10 | 50.65 | 50.30 | 50.41 | 0.35   | 0.13   | 0.22 | 0.35 |
| 22 | 4 | 27/apr/10 | 50.43 | 49.21 | 49.34 | 1.22   | 0.02   | 1.20 | 1.22 |
| 23 | 5 | 28/apr/10 | 49.63 | 48.98 | 49.37 | 0.65   | 0.29   | 0.36 | 0.65 |
| 24 | 6 | 29/apr/10 | 50.33 | 49.61 | 50.23 | 0.72   | 0.96   | 0.24 | 0.96 |
| 25 | 7 | 30/apr/10 | 50.20 | 49.20 | 49.24 | 1.00   | 0.00   | 1.00 | 1.00 |

atr Sheet2

Backtesten  
kan beginnen



# Resultaten Evalueren



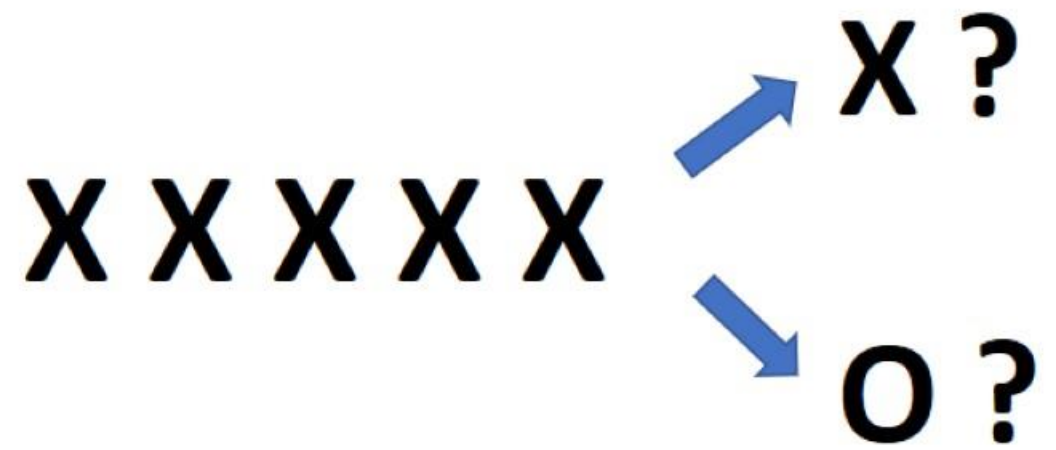
Des te meer  
signalen,  
des te beter



Munt  
opgooien



Reeks



Liefst niet te  
veel  
automatiseren



# Controleren Narekenen



Bijsturen of  
aanpassen

=

steeds  
opnieuw  
beginnen

