

Basic Operators

This video shows how an alpha can be created using the current volume data and how various operators can be used to modify and improve the alpha. The 4 graphical results from 03:06 onwards are only visible to consultants: PnL by Capitalization, Alpha Coverage, Capital Distribution and Sharpe by Sector. The simulation setting "Max stock weight" has been renamed to "Truncation".

Step Sum & IndNeutralize Operators

HYPOTHESIS

Large current volume implies a bullish sentiment about the stock

ALPHA EXPRESSION

The screenshot shows the 'webSim' interface with a dark green header containing 'Home', 'Alphas', 'Challenge', and 'Solve-a-thon' links. Below the header is a settings panel with a gear icon and a 'Save Settings' button. The settings are organized into two columns:

PARAMETER	VALUE
REGION *	USA
UNIVERSE	TOP3000
DELAY *	1
DECAY	6
MAX STOCK WEIGHT	0.1
NEUTRALIZATION	Subindustry
LOOKBACK DAYS *	256

Fields marked with a * must have the same value for all alphas in a simulation.

```
group_neutralize(volume/(ts_sum(volume,60)/60),sector)
```

TS_SUM OPERATOR

Sums the values of vector x for the past n days

*note that n must be less than 512

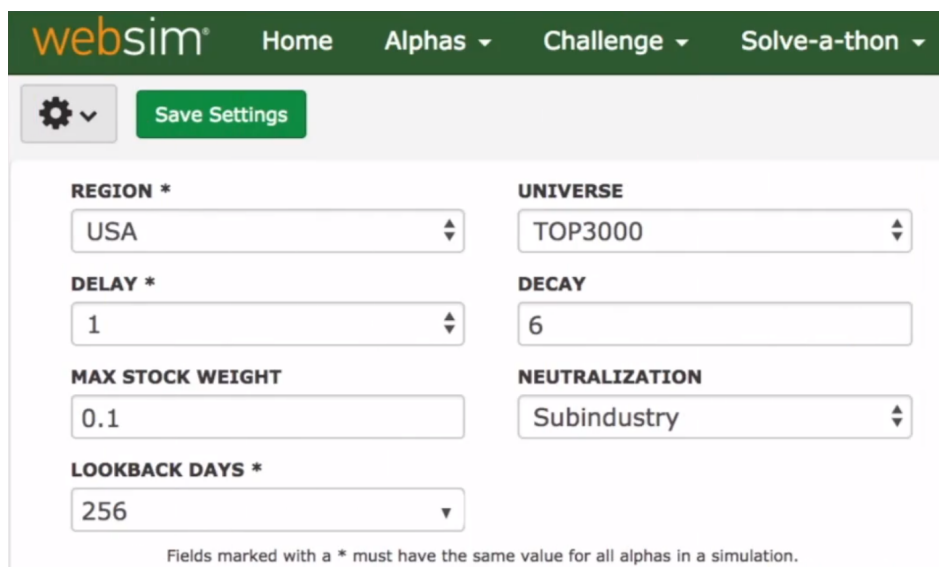
Used to find the average of a given quantity

GROUP_NEUTRALIZE OPERATOR

Takes alpha x and the group as input

Neutralizes alpha x against specified groupings

ALPHA EXPRESSION



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Parameter	Value
REGION *	USA
UNIVERSE	TOP3000
DELAY *	1
DECAY	6
MAX STOCK WEIGHT	0.1
NEUTRALIZATION	Subindustry
LOOKBACK DAYS *	256

$$ts_step(20) * volume / (ts_sum(volume, 60) / 60)$$

This prevents any sudden change in positions and controls the turnover or the cost involved in trading.

TS_STEP OPERATOR

The step operator creates a vector for each instrument whose value is n for today, $n-1$ for yesterday and so on.

The step function here helps to smooth out the effect of the large change in the ratio on a given day compared with its usual value.

Product Rank & Signed Power Operators

HYPOTHESIS

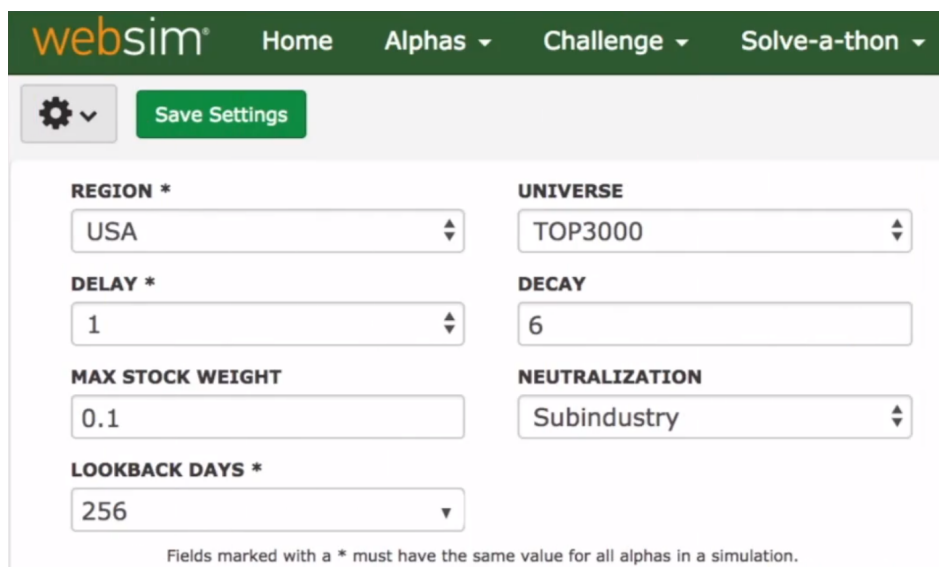
If something increases today

it will decrease tomorrow

If something decreases today

it will increase tomorrow

ALPHA EXPRESSION



The screenshot shows the webSim interface with a dark green header containing navigation links: Home, Alphas, Challenge, and Solve-a-thon. Below the header is a settings panel with a gear icon and a 'Save Settings' button. The settings are organized into two columns. The left column includes: 'REGION *' with a dropdown set to 'USA', 'DELAY *' with a dropdown set to '1', 'MAX STOCK WEIGHT' with a text input set to '0.1', and 'LOOKBACK DAYS *' with a dropdown set to '256'. The right column includes: 'UNIVERSE' with a dropdown set to 'TOP3000', 'DECAY' with a text input set to '6', and 'NEUTRALIZATION' with a dropdown set to 'Subindustry'. A note at the bottom states: 'Fields marked with a * must have the same value for all alphas in a simulation.'

-(today's price-yesterday's price)

Rank(-(close-(Ts_Product(close,5))^(0.2)))

RANK OPERATOR

Ranks the value of input x among all the instruments

Returns float numbers equally distributed between 0.0 and 1.0

ALPHA EXPRESSION

Rank(-signedpower(close-sum(close,5)/5,2))

SIGNEDPOWER OPERATOR

SignedPower operator takes as input the expression and the power to be applied on the expression.

It outputs the same sign as the input value and applies the power to the absolute value of the input expression

SigendPower(x, e)

Syntax: Sign(x)*(Abs(x)^e)

Description: Returns the signed sqrt of the absolute difference between two data elements as stock weights.

Example: SignedPower(close-open, 0.5)

Correlation & Rank Operators

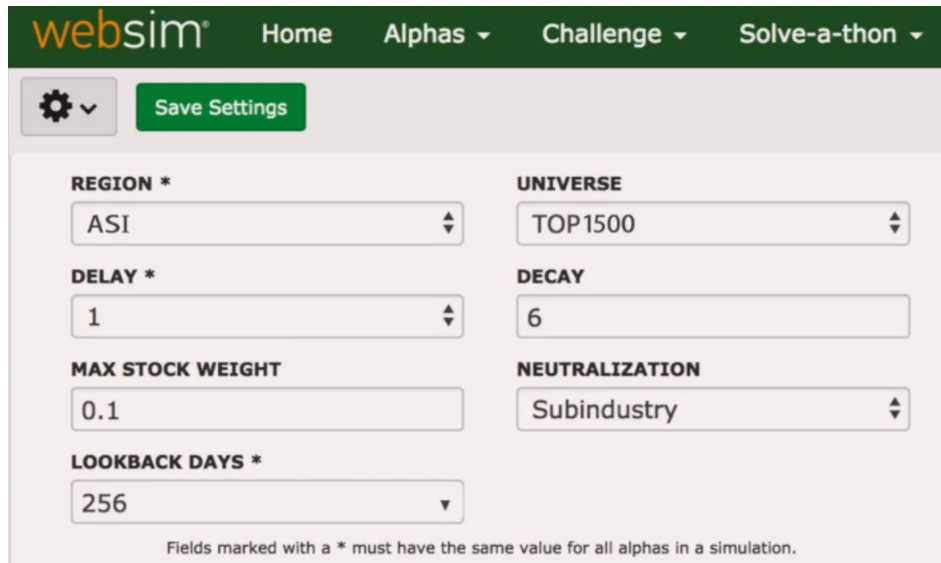
PRICE

Tells you which direction the stock is moving

VOLUME

Tells you whether there are buyers or sellers for this stock

ALPHA EXPRESSION



The screenshot shows the 'webSim' interface for configuring alpha expressions. At the top is a green navigation bar with 'Home', 'Alphas', 'Challenge', and 'Solve-a-thon' links. Below this is a settings panel with a gear icon and a 'Save Settings' button. The settings are organized into two columns:

- REGION ***: A dropdown menu currently set to 'ASI'.
- UNIVERSE**: A dropdown menu currently set to 'TOP1500'.
- DELAY ***: A dropdown menu currently set to '1'.
- DECAY**: A text input field containing the number '6'.
- MAX STOCK WEIGHT**: A text input field containing '0.1'.
- NEUTRALIZATION**: A dropdown menu currently set to 'Subindustry'.
- LOOKBACK DAYS ***: A dropdown menu currently set to '256'.

At the bottom of the settings panel, a note states: 'Fields marked with a * must have the same value for all alphas in a simulation.'

`ts_corr(rank(close), rank(volume/adv20), 5)`

1. If the close price and volume ratio have increased more than the other stocks in the universe, the correlation will be positive.
2. If the close price and volume ratio have fallen more than the other stocks in the universe, the correlation will be positive.
3. If the close price has increased and the volume ratio has fallen as compared to other stocks in the universe, the price trend will likely continue.
4. If the close price has fallen and the volume ratio has increased as compared to other stocks in the universe, the price trend will likely revert.

TS_CORR

Calculates the correlation of the values in the input vectors x and y for the past n days

*n must be less than 512

RANK

Ranks the values of the input x among all instruments

The return values are float numbers equally distributed between 0.0 and 1.0

Helps smooth out relative difference among stocks.

Facilitates capital allocation and long/short decisions.

Scale & GroupMean Operators

REVERSION

If something increases today

it will decrease tomorrow

If something decreases today

it will increase tomorrow

VOLUME RATIO

The higher the current volume,

the more bullish the market will be on that stock.

ALPHA IDEAS

```
ts_sum(-returns, 5)
```

```
ts_decay_linear(volume/adv20, 5, dense=false)
```

SCALE OPERATOR

Alpha X book size = 1

Sum of the absolute values of the alphas is 1

scale(X) * 1000

ALPHA EXPRESSIONS

The screenshot shows the 'webSim' interface with a dark green header containing navigation links: Home, Alphas (with a dropdown arrow), Challenge (with a dropdown arrow), and Solve-a-thon (with a dropdown arrow). Below the header is a settings bar with a gear icon and a 'Save Settings' button. The main settings area is divided into two columns. The left column contains: 'REGION *' with a dropdown menu showing 'USA'; 'DELAY *' with a dropdown menu showing '1'; 'MAX STOCK WEIGHT' with a text input field showing '0.1'; and 'LOOKBACK DAYS *' with a dropdown menu showing '256'. The right column contains: 'UNIVERSE' with a dropdown menu showing 'TOP3000'; 'DECAY' with a text input field showing '6'; and 'NEUTRALIZATION' with a dropdown menu showing 'Subindustry'. At the bottom of the settings area, a note states: 'Fields marked with a * must have the same value for all alphas in a simulation.'

```
A=ts_sum(-returns, 5);
```

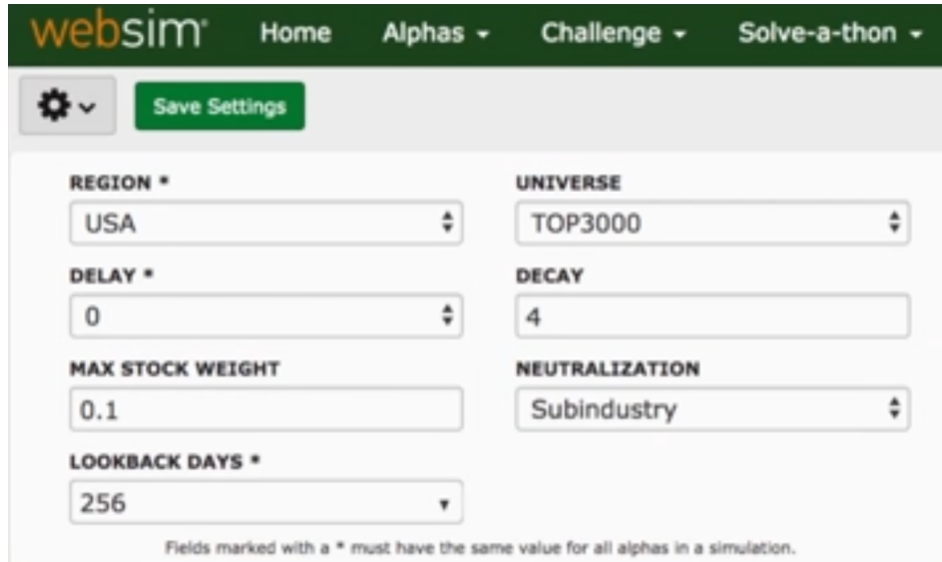
```
B=ts_decay_linear(volume/adv20,5);
```

```
rank(scale(A,scale=1,longscale=1,shortscale=1)+scale(B,scale=1,longscale=1,shortscale=1))
```

NEUTRALIZATION OPERATOR

While doing the neutralization, we choose the group over which we want to neutralize our Alpha. What this actually does is subtract the alpha value for a stock from the average of the alpha values of all the stocks belonging to the same group.

ALPHA EXPRESSIONS



The screenshot shows the 'Alphas' settings page on the webSim platform. The page has a dark green header with the 'webSim' logo and navigation links: 'Home', 'Alphas', 'Challenge', and 'Solve-a-thon'. Below the header is a settings bar with a gear icon and a 'Save Settings' button. The main content area contains several configuration fields arranged in two columns. The left column includes 'REGION *' (set to 'USA'), 'DELAY *' (set to '0'), 'MAX STOCK WEIGHT' (set to '0.1'), and 'LOOKBACK DAYS *' (set to '256'). The right column includes 'UNIVERSE' (set to 'TOP3000'), 'DECAY' (set to '4'), and 'NEUTRALIZATION' (set to 'Subindustry'). A note at the bottom states: 'Fields marked with a * must have the same value for all alphas in a simulation.'

Field	Value
REGION *	USA
UNIVERSE	TOP3000
DELAY *	0
DECAY	4
MAX STOCK WEIGHT	0.1
NEUTRALIZATION	Subindustry
LOOKBACK DAYS *	256

Fields marked with a * must have the same value for all alphas in a simulation.

```
rank(group_mean(ts_delta(close,5),1,subindustry)-ts_delta(close,5))
```