

# ROLLINGAVERAGE Function

## Contents:

- *Basic Usage*
  - *Syntax and Arguments*
    - *col\_ref*
    - *rowsBefore\_integer, rowsAfter\_integer*
  - *Examples*
    - *Example - Compute prior quarter values*
    - *Example - Rolling window functions*
    - *Example - Rolling computations for racing splits*
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Computes the rolling average of values forward or backward of the current row within the specified column.

- If an input value is missing or null, it is not factored in the computation. For example, for the first row in the dataset, the rolling average of previous values is the value in the first row.
- The row from which to extract a value is determined by the order in which the rows are organized based on the `order` parameter.
- If you are working on a randomly generated sample of your dataset, the values that you see for this function might not correspond to the values that are generated on the full dataset during job execution.
- The function takes a column name and two optional integer parameters that determine the window backward and forward of the current row.
  - The default integer parameter values are `-1` and `0`, which computes the rolling average from the current row back to the first row of the dataset.
- This function works with the Window transform. See *Window Transform*.

For more information on a non-rolling version of this function, see *AVERAGE Function*.

**Wrangle vs. SQL:** This function is part of Wrangle , a proprietary data transformation language. Wrangle is not SQL. For more information, see *Wrangle Language*.

## Basic Usage

### Column example:

```
rollingaverage(myCol)
```

**Output:** Returns the rolling average of all values in the `myCol` column.

### Rows before example:

```
rollingaverage(myNumber, 3)
```

**Output:** Returns the rolling average of the current row and the three previous row values in the `myNumber` column.

### Rows before and after example:

```
rollingaverage(myNumber, 3, 2)
```

**Output:** Returns the rolling average of the three previous row values, the current row value, and the two rows after the current one in the `myNumber` column.

## Syntax and Arguments

```
rollingaverage(col_ref, rowsBefore_integer, rowsAfter_integer) order: order_col [group: group_col]
```

Argument	Required?	Data Type	Description
col_ref	Y	string	Name of column whose values are applied to the function
rowsBefore_integer	N	integer	Number of rows before the current one to include in the computation
rowsAfter_integer	N	integer	Number of rows after the current one to include in the computation

For more information on the `order` and `group` parameters, see *Window Transform*.

For more information on syntax standards, see *Language Documentation Syntax Notes*.

### col\_ref

Name of the column whose values are used to compute the rolling average.

- Multiple columns and wildcards are not supported.

### Usage Notes:

Required?	Data Type	Example Value
Yes	String (column reference to Integer or Decimal values)	myColumn

### rowsBefore\_integer, rowsAfter\_integer

Integers representing the number of rows before or after the current one from which to compute the rolling average, including the current row. For example, if the first value is 5, the current row and the five rows before it are used in the computation. Negative values for `rowsAfter_integer` compute the rolling function from rows preceding the current one.

- `rowBefore=0` generates the current row value only.
- `rowBefore=-1` uses all rows preceding the current one.
- If `rowsAfter` is not specified, then the value 0 is applied.
- If a `group` parameter is applied, then these parameter values should be no more than the maximum number of rows in the groups.

### Usage Notes:

Required?	Data Type	Example Value
No	Integer	4

## Examples

**Tip:** For additional examples, see *Common Tasks*.

### Example - Compute prior quarter values

This example covers how to use the NEXT function to create windows of data from the current row and subsequent (next) rows in the dataset. You can then apply rolling computations across these windows of data.

#### Functions:

Item	Description
NEXT Function	Extracts the value from a column that is a specified number of rows after the current value.
ROLLINGAVERAGE Function	Computes the rolling average of values forward or backward of the current row within the specified column.
NUMFORMAT Function	Formats a numeric set of values according to the specified number formatting. Source values can be a literal numeric value, a function returning a numeric value, or reference to a column containing an Integer or Decimal values.

#### Source:

The following dataset contains order information for the preceding 12 months. You want to compare the current month's average against the preceding quarter.

Date	Amount
12/31/15	118
11/30/15	6
10/31/15	443
9/30/15	785
8/31/15	77
7/31/15	606
6/30/15	421
5/31/15	763
4/30/15	305
3/31/15	824
2/28/15	135
1/31/15	523

#### Transformation:

Using the ROLLINGAVERAGE function, you can generate a column containing the rolling average of the current month and the two previous months:

<b>Transformation Name</b>	Window
<b>Parameter: Formulas</b>	ROLLINGAVERAGE(Amount, 3, 0)
<b>Parameter: Order by</b>	-Date

Note the sign of the second parameter and the `order` parameter. The sort is in the reverse order of the `Date` parameter, which preserves the current sort order. As a result, the second parameter, which identifies the number of rows to use in the calculation, must be positive to capture the previous months.

Technically, this computation does not capture the prior quarter, since it includes the current quarter as part of the computation. You can use the following column to capture the rolling average of the preceding month, which then becomes the true rolling average for the prior quarter. The `window` column refers to the name of the column generated from the previous step:

<b>Transformation Name</b>	Window
<b>Parameter: Formulas</b>	NEXT(window, 1)
<b>Parameter: Order by</b>	-Date

Note that the order parameter must be preserved. This new column, `window1`, contains your prior quarter rolling average:

<b>Transformation Name</b>	Rename columns
<b>Parameter: Option</b>	Manual rename
<b>Parameter: Column</b>	window1
<b>Parameter: New column name</b>	'Amount_PriorQtr'

You can reformat this numeric value:

<b>Transformation Name</b>	Edit column with formula
<b>Parameter: Columns</b>	Amount_PriorQtr
<b>Parameter: Formula</b>	NUMFORMAT(Amount_PriorQtr, '###.00')

You can use the following transformation to calculate the net change. This formula computes the change as a percentage of the prior quarter and then formats it as a two-digit percentage.

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	NUMFORMAT(((Amount - Amount_PriorQtr) / Amount_PriorQtr) * 100, '##.##')
<b>Parameter: New column name</b>	'NetChangePct_PriorQtr'

## Results:

**NOTE:** You might notice that there are computed values for `Amount_PriorQtr` for February and March. These values do not factor in a full three months because the data is not present. The January value does not exist since there is no data preceding it.

Date	Amount	Amount_PriorQtr	NetChangePct_PriorQtr
------	--------	-----------------	-----------------------

12/31/15	118	411.33	-71.31
11/30/15	6	435.00	-98.62
10/31/15	443	489.33	-9.47
9/30/15	785	368.00	113.32
8/31/15	77	596.67	-87.1
7/31/15	606	496.33	22.1
6/30/15	421	630.67	-33.25
5/31/15	763	421.33	81.09
4/30/15	305	494.00	-38.26
3/31/15	824	329.00	150.46
2/28/15	135	523.00	-.74.19
1/31/15	523		

### Example - Rolling window functions

This example describes how to use rolling computational functions.

#### Functions:

Item	Description
ROLLINGSUM Function	Computes the rolling sum of values forward or backward of the current row within the specified column.
ROLLINGAVERAGE Function	Computes the rolling average of values forward or backward of the current row within the specified column.
ROWNUMBER Function	Generates a new column containing the row number as sorted by the <code>order</code> parameter and optionally grouped by the <code>group</code> parameter.

Also:

Item	Description
MONTH Function	Derives the month integer value from a Datetime value. Source value can be a reference to a column containing Datetime values or a literal.
FLOOR Function	Computes the largest integer that is not more than the input value. Input can be an Integer, a Decimal, a column reference, or an expression.
ROWNUMBER Function	Generates a new column containing the row number as sorted by the <code>order</code> parameter and optionally grouped by the <code>group</code> parameter.

The following dataset contains sales data over the final quarter of the year.

#### Source:

Date	Sales
10/2/16	200
10/9/16	500
10/16/16	350
10/23/16	400
10/30/16	190

11/6/16	550
11/13/16	610
11/20/16	480
11/27/16	660
12/4/16	690
12/11/16	810
12/18/16	950
12/25/16	1020
1/1/17	680

**Transformation:**

First, you want to maintain the row information as a separate column. Since data is ordered already by the `Date` column, you can use the following:

<b>Transformation Name</b>	Window
<b>Parameter: Formulas</b>	ROWNUMBER ( )
<b>Parameter: Order by</b>	Date

Rename this column to `rowId` for week of quarter.

Now, you want to extract month and week information from the `Date` values. Deriving the month value:

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	MONTH(Date)
<b>Parameter: New column name</b>	'Month'

Deriving the quarter value:

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	(1 + FLOOR(((month-1)/3)))
<b>Parameter: New column name</b>	'QTR'

Deriving the week-of-quarter value:

<b>Transformation Name</b>	Window
<b>Parameter: Formulas</b>	ROWNUMBER ( )
<b>Parameter: Group by</b>	QTR

<b>Parameter: Order by</b>	Date
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Rename this column WOQ (week of quarter).

Deriving the week-of-month value:

<b>Transformation Name</b>	Window
<b>Parameter: Formulas</b>	ROWNUMBER ( )
<b>Parameter: Group by</b>	Month
<b>Parameter: Order by</b>	Date

Rename this column WOM (week of month).

Now, you perform your rolling computations. Compute the running total of sales using the following:

<b>Transformation Name</b>	Window
<b>Parameter: Formulas</b>	ROLLINGSUM(Sales, -1, 0)
<b>Parameter: Group by</b>	QTR
<b>Parameter: Order by</b>	Date

The -1 parameter is used in the above computation to gather the rolling sum of all rows of data from the current one to the first one. Note that the use of the QTR column for grouping, which moves the value for the 01/01/2017 into its own computational bucket. This may or may not be preferred.

Rename this column QTD (quarter to-date). Now, generate a similar column to compute the rolling average of weekly sales for the quarter:

<b>Transformation Name</b>	Window
<b>Parameter: Formulas</b>	ROUND(ROLLINGAVERAGE(Sales, -1, 0))
<b>Parameter: Group by</b>	QTR
<b>Parameter: Order by</b>	Date

Since the ROLLINGAVERAGE function can compute fractional values, it is wrapped in the ROUND function for neatness. Rename this column avgWeekByQuarter.

## Results:

When the unnecessary columns are dropped and some reordering is applied, your dataset should look like the following:

Date	WOQ	Sales	QTD	avgWeekByQuarter
10/2/16	1	200	200	200
10/9/16	2	500	700	350
10/16/16	3	350	1050	350
10/23/16	4	400	1450	363
10/30/16	5	190	1640	328

11/6/16	6	550	2190	365
11/13/16	7	610	2800	400
11/20/16	8	480	3280	410
11/27/16	9	660	3940	438
12/4/16	10	690	4630	463
12/11/16	11	810	5440	495
12/18/16	12	950	6390	533
12/25/16	13	1020	7410	570
1/1/17	1	680	680	680

### Example - Rolling computations for racing splits

This example describes how to use rolling statistical functions.

#### Functions:

Item	Description
ROLLINGAVERAGE Function	Computes the rolling average of values forward or backward of the current row within the specified column.
ROLLINGMAX Function	Computes the rolling maximum of values forward or backward of the current row within the specified column. Inputs can be Integer, Decimal, or Datetime.
ROLLINGSTDEV Function	Computes the rolling standard deviation of values forward or backward of the current row within the specified column.
ROLLINGVAR Function	Computes the rolling variance of values forward or backward of the current row within the specified column.
ROLLINGSTDEVSAMP Function	Computes the rolling standard deviation of values forward or backward of the current row within the specified column using the sample statistical method.
ROLLINGVARSAMP Function	Computes the rolling variance of values forward or backward of the current row within the specified column using the sample statistical method.

Also:

Item	Description
MERGE Function	Merges two or more columns of String type to generate output of String type. Optionally, you can insert a delimiter between the merged values.
ROUND Function	Rounds input value to the nearest integer. Input can be an Integer, a Decimal, a column reference, or an expression. Optional second argument can be used to specify the number of digits to which to round.

#### Source:

In this example, the following data comes from times recorded at regular intervals during a three-lap race around a track. The source data is in cumulative time in seconds (`time_sc`). You can use ROLLING and other windowing functions to break down the data into more meaningful metrics.

lap	quarter	time_sc
1	0	0.000
1	1	19.554
1	2	39.785



1	3	60.021
2	0	80.950
2	1	101.785
2	2	121.005
2	3	141.185
3	0	162.008
3	1	181.887
3	2	200.945
3	3	220.856

**Transformation:**

**Primary key:** Since the quarter information repeats every lap, there is no unique identifier for each row. The following steps create this identifier:

<b>Transformation Name</b>	Change column data type
<b>Parameter: Columns</b>	lap,quarter
<b>Parameter: New type</b>	String

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	MERGE(['l',lap,'q',quarter])
<b>Parameter: New column name</b>	'splitId'

**Get split times:** Use the following transform to break down the splits for each quarter of the race:

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Multiple row formula
<b>Parameter: Formula</b>	ROUND(time_sc - PREV(time_sc, 1), 3)
<b>Parameter: Order rows by</b>	splitId
<b>Parameter: New column name</b>	'split_time_sc'

**Compute rolling computations:** You can use the following types of computations to provide rolling metrics on the current and three previous splits:

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Multiple row formula
<b>Parameter: Formula</b>	ROLLINGAVERAGE(split_time_sc, 3)
<b>Parameter: Order rows by</b>	splitId

<b>Parameter: New column name</b>	'ravg'
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<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Multiple row formula
<b>Parameter: Formula</b>	ROLLINGMAX(split_time_sc, 3)
<b>Parameter: Order rows by</b>	splitId
<b>Parameter: New column name</b>	'rmax'

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Multiple row formula
<b>Parameter: Formula</b>	ROLLINGMIN(split_time_sc, 3)
<b>Parameter: Order rows by</b>	splitId
<b>Parameter: New column name</b>	'rmin'

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Multiple row formula
<b>Parameter: Formula</b>	ROUND(ROLLINGSTDEV(split_time_sc, 3), 3)
<b>Parameter: Order rows by</b>	splitId
<b>Parameter: New column name</b>	'rstdev'

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Multiple row formula
<b>Parameter: Formula</b>	ROUND(ROLLINGVAR(split_time_sc, 3), 3)
<b>Parameter: Order rows by</b>	splitId
<b>Parameter: New column name</b>	'rvar'

**Compute rolling computations using sample method:** These metrics compute the rolling STDEV and VAR on the current and three previous splits using the sample method:

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Multiple row formula
<b>Parameter: Formula</b>	ROUND(ROLLINGSTDEVSAMP(split_time_sc, 3), 3)
<b>Parameter: Order rows by</b>	splitId
<b>Parameter: New column name</b>	'rstdev_samp'

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Multiple row formula
<b>Parameter: Formula</b>	ROUND(ROLLINGVARSAMP(split_time_sc, 3), 3)
<b>Parameter: Order rows by</b>	splitId
<b>Parameter: New column name</b>	'rvar_samp'

## Results:

When the above transforms have been completed, the results look like the following:

lap	quarter	splitId	time_sc	split_time_sc	rvar_samp	rstdev_samp	rvar	rstdev	rmin	rmax	ravg
1	0	l1q0	0								
1	1	l1q1	20.096	20.096			0	0	20.096	20.096	20.096
1	2	l1q2	40.53	20.434	0.229	0.479	0.029	0.169	20.096	20.434	20.265
1	3	l1q3	61.031	20.501	0.154	0.392	0.031	0.177	20.096	20.501	20.344
2	0	l2q0	81.087	20.056	0.315	0.561	0.039	0.198	20.056	20.501	20.272
2	1	l2q1	101.383	20.296	0.142	0.376	0.029	0.17	20.056	20.501	20.322
2	2	l2q2	122.092	20.709	0.617	0.786	0.059	0.242	20.056	20.709	20.39
2	3	l2q3	141.886	19.794	0.621	0.788	0.113	0.337	19.794	20.709	20.214
3	0	l3q0	162.581	20.695	0.579	0.761	0.139	0.373	19.794	20.709	20.373
3	1	l3q1	183.018	20.437	0.443	0.666	0.138	0.371	19.794	20.709	20.409
3	2	l3q2	203.493	20.475	0.537	0.733	0.113	0.336	19.794	20.695	20.35
3	3	l3q3	222.893	19.4	0.520	0.721	0.252	0.502	19.4	20.695	20.252

You can reduce the number of steps by applying a window transform such as the following:

<b>Transformation Name</b>	Window
<b>Parameter: Formula1</b>	lap
<b>Parameter: Formula2</b>	rollingaverage(split_time_sc, 0, 3)
<b>Parameter: Formula3</b>	rollingmax(split_time_sc, 0, 3)
<b>Parameter: Formula4</b>	rollingmin(split_time_sc, 0, 3)
<b>Parameter: Formula5</b>	round(rollingstdev(split_time_sc, 0, 3), 3)
<b>Parameter: Formula6</b>	round(rollingvar(split_time_sc, 0, 3), 3)
<b>Parameter: Formula7</b>	round(rollingstdevsamp(split_time_sc, 0, 3), 3)
<b>Parameter: Formula8</b>	round(rollingvarsamp(split_time_sc, 0, 3), 3)
<b>Parameter: Group by</b>	lap
<b>Parameter: Order by</b>	lap

However, you must rename all of the generated `windowX` columns.