

# APPROXIMATEQUARTILE Function

## Contents:

- *Basic Usage*
- *Syntax and Arguments*
  - *function\_col\_ref*
  - *num\_quartile*
  - *dec\_error\_bound*
- *Examples*
  - *Example - Percentile functions*

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Computes an approximation for a specified quartile across all row values in a column or group. Input column can be of Integer or Decimal.

- If a row contains a missing or null value, it is not factored into the calculation. If the entire column contains no values, the function returns a null value.
- When used in a `pivot` transform, the function is computed for each instance of the value specified in the `group` parameter. See *Pivot Transform*.
- The approximate percentile functions utilize a different algorithm for efficiently estimating quantiles for streaming and distributed processing, depending on the running environment where the function is computed.

**Tip:** Approximation functions are suitable for larger datasets. As the number of rows increases, accuracy and calculation performance improves for these functions.

- For an exact calculation of this function, see *QUARTILE Function*.

Quartiles are computed as follows:

Quartile	Description
0	Minimum value
1	25th percentile
2	Median value
3	75th percentile and higher

**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

```
approximatequartile(myScores, 3)
```

**Output:** Computes the approximate value that is at the 3rd quartile across all values in the `myScores` column.

## Syntax and Arguments

```
approximatequartile(function_col_ref,num_quartile) [group:group_col_ref] [limit:  
limit_count]
```

Argument	Required?	Data Type	Description
function_col_ref	Y	string	Name of column to which to apply the function
num_quartile	Y	integer	Integer value (0-3) of the quartile to compute
dec_error_bound	N	decimal	Error factor for computing approximations. Decimal value represents error factor as a percentage (0.4 is 0.4%).

For more information on the `group` and `limit` parameters, see *Pivot Transform*.

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

### function\_col\_ref

Name of the column the values of which you want to calculate the quartile. Column must contain Integer or Decimal values.

- Literal values are not supported as inputs.
- Multiple columns and wildcards are not supported.

#### Usage Notes:

Required?	Data Type	Example Value
Yes	String (column reference)	precipitationIn

### num\_quartile

Integer literal value indicating the quartile that you wish to compute. Input value must be between 0 and 3, inclusive.

- Column or function references are not supported.
- Multiple columns and wildcards are not supported.

#### Usage Notes:

Required?	Data Type	Example Value
Yes	Integer	3

### dec\_error\_bound

As needed, you can insert an error boundary factor as a parameter into the computation of this approximate value.

- This value must be a Decimal literal value.
- This decimal value represents the percentage error factor. By default, this value is 0.5 (0.5%).

#### Usage Notes:

Required?	Data Type	Example Value
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No	Decimal (literal)	0 . 01
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## Examples

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

### Example - Percentile functions

This example illustrates how you can apply the following percentile-related functions to your transformations:

- **MEDIAN** - Calculate the median value from a column of values. See *MEDIAN Function*.
- **PERCENTILE** - Calculate a specified percentile for a column of values. See *PERCENTILE Function*.
- **QUARTILE** - Calculate a specified quartile for a column of values. See *QUARTILE Function*.

The following functions use an approximation technique for calculating median, percentile, and quartiles. In some cases, these calculations can be computed faster across large datasets.

- **APPROXIMATEMEDIAN** - Calculate a close approximation of the median value from a column of values. See *APPROXIMATEMEDIAN Function*.
- **APPROXIMATEPERCENTILE** - Calculate a close approximation of a specified percentile for a column of values. See *APPROXIMATEPERCENTILE Function*.
- **APPROXIMATEQUARTILE** - Calculate a close approximation of a specified quartile for a column of values. See *APPROXIMATEQUARTILE Function*.

### Source:

The following table lists each student's height in inches:

Student	Height
1	64
2	65
3	63
4	64
5	62
6	66
7	66
8	65
9	69
10	66
11	73
12	69
13	69
14	61
15	64
16	61
17	71

18	67
19	73
20	66

**Transformation:**

Use the following transformations to calculate the median height in inches, a specified percentile and the first quartile.

- The first function uses a precise algorithm which can be slow to execute across large datasets.
- The second function uses an appropriate approximation algorithm, which is much faster to execute across large datasets.
  - These approximate functions can use an error boundary parameter, which is set to 0.4 (0.4%) across all functions.

**Median:** This transformation calculates the median value, which corresponds to the 50th percentile.

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	median(heightIn)
<b>Parameter: New column name</b>	'medianIn'

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	approximateMedian(heightIn, 0.4)
<b>Parameter: New column name</b>	'approxMedianIn'

**Percentile:** This transformation calculates the 68th percentile.

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	percentile(heightIn, 68, linear)
<b>Parameter: New column name</b>	'percentile68In'

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	approximatepercentile(heightIn, 68, 0.4)
<b>Parameter: New column name</b>	'approxPercentile68In'

**Quartile:** This transformation calculates the first quartile, which corresponds to the 25th percentile.

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	quartile(heightIn, 1, linear)
<b>Parameter: New column name</b>	'percentile25In'

<b>Transformation Name</b>	New formula
<b>Parameter: Formula type</b>	Single row formula
<b>Parameter: Formula</b>	approximatequartile(heightIn, 1, 0.4)
<b>Parameter: New column name</b>	'approxPercentile25In'

**Results:**

studentId	heightIn	approxPercentile25In	percentile25In	approxPercentile68In	percentile68In	approxMedianIn	
1	64	64	64	67.1	66.92	66	6
2	65	64	64	67.1	66.92	66	6
3	63	64	64	67.1	66.92	66	6
4	64	64	64	67.1	66.92	66	6
5	62	64	64	67.1	66.92	66	6
6	66	64	64	67.1	66.92	66	6
7	66	64	64	67.1	66.92	66	6
8	65	64	64	67.1	66.92	66	6
9	69	64	64	67.1	66.92	66	6
10	66	64	64	67.1	66.92	66	6
11	73	64	64	67.1	66.92	66	6
12	69	64	64	67.1	66.92	66	6
13	69	64	64	67.1	66.92	66	6
14	61	64	64	67.1	66.92	66	6
15	64	64	64	67.1	66.92	66	6
16	61	64	64	67.1	66.92	66	6
17	71	64	64	67.1	66.92	66	6
18	67	64	64	67.1	66.92	66	6
19	73	64	64	67.1	66.92	66	6
20	66	64	64	67.1	66.92	66	6