**Tiki Calculations** started out as an advanced rating system, and has since evolved into a powerful general purpose calculations system.

# Advanced Ratings & Calculation Syntax

## Overview

Use this page to configure a "rating" system to evaluate tracker items or wiki pages. Introduced in Tiki5, the advanced rating feature allows for more control over the aggregation of scores. You will also see in this documentation page how to use the **calculations syntax**, which also applies at the Mathematical Calculation Tracker Field.

## To access

Click the **Ratings** icon on the Admin Panel or Access [http://example.org/tiki-admin.php?page=rating](http://example.org/tiki-admin.php?page=rating)

## Note

Tiki currently supports sorting through advanced rating in:

- Articles
- Wiki
- Comments
- See also Mathematical Calculation Tracker Field

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global configuration</td>
<td>Enable the internal rating system, used for calculating values from trackers, articles, or other features.</td>
<td></td>
</tr>
</tbody>
</table>
### Setting Description Default

**Rating recalculation mode:** Determines when and how rating aggregates are recalculated:

- **On vote** (default): indicates that the score for the object should be recalculated every time a vote is performed. This option is suitable for sites with lower volumes and relatively simple calculation methods when ratings are used.
- **Random on load**: will cause a few scores to be calculated on page load on a random basis (odds and count can be configured to adapt to site load). This option is suitable for calculation rules involving time that must be recalculated even if no new votes occurred.
- **Random on vote** is similar to random on load, but will recalculate multiple scores (not necessarily including the current object) when a vote is performed. It is suitable for similar situations. The best option will depend on site load.
- **Periodic**: is the best option for heavy load sites, making sure all calculations are done outside the web requests. A cron job must be set-up manually by the site's administrator. A sample script is available at the end of this page. Depending on the site load, some options may be better than others; on large volume sites, we recommend **cron job**. The **Recalculate on vote** recalculation may be inaccurate if rating calculation depends time.

**Before any attempt to re-index the object:** Ties into the **Unified Index** and updates the calculation at index-time.

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiki</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Recalculate on vote**

**Recalculation odds (1 in X):**

**Recalculation count:**

**Wiki**

**Simple wiki ratings** Enable a simple rating bar at the top of each wiki page.

**Wiki rating options:** List of options for the simple wiki ratings. 1,2,3,4,5

**Articles**

Enable a simple rating bar at the top of each articles page.

**User ratings on articles**

**Article rating options:**

The feature must first be enabled through this same administration panel. Along with the feature, a few options are available. Among them, the score recalculation period must be defined. These are the available options:

- **On vote (default)** indicates that the score for the object should be recalculated every time a vote is
performed. This option is suitable for sites with lower volumes and relatively simple calculation methods when ratings are used.

- **Random on load** will cause a few scores to be calculated on page load on a random basis (odds and count can be configured to adapt to site load). This option is suitable for calculation rules involving time that must be recalculated even if no new votes occurred.

- **Random on vote** is similar to random on load, but will recalculate multiple scores (not necessarily including the current object) when a vote is performed. It is suitable for similar situations. The best option will depend on site load.

- **Periodic** is the best option for heavy load sites, making sure all calculations are done outside the web requests. A cron job must be set-up manually by the site's administrator. A sample script is available at the end of this page.

For the random options, the odds of recalculating must be specified as a dice roll. For each occurrence of a recalculation, a limit to how many scores can be calculated must be specified to avoid the hang-up effect on the page load.

The value ranges for each object type can also be specified through the administration panels.

The common `sort_mode` parameter to lists can be used to activate sorting using advanced ratings. To do so, the sort mode must be set to `adv_rating_X_asc` or `adv_rating_X_desc` where `X` is the ID of the rating configuration. The default sort can also be set to advanced ratings in the administration panel where applicable.

## Calculation configuration

From the administration panel, new calculations can be added. Initially, only the name is required. When created, the calculation will contain suitable default values.

For wiki pages:

Thus, visitors can provide feedback like:

- Did this page help you solve the issue?
- Was this page easy to understand?
Sorting items according to advanced rating

Note that the sort mode to use when needing to sort by advanced rating is either `adv_rating_xx_asc` or `adv_rating_xx_desc`, where `xx` is the `ratingConfigId`.

Set-up

By default, each calculated value is kept for 1 hour (3600 seconds). This limit does not apply when recalculating on vote, but is used for every other technique to avoid recalculating the same scores over and over again.

The calculation is defined as a small piece of code, similar to functional languages, which is very close to mathematical representations. Creating custom formulas is expected to require some mathematical skills. However, this documentation should provide examples for most frequent cases.

The editor in the administration panel performs extensive validation and will make it impossible to save the formula unless it can be evaluated. Checks are performed for:

- Syntax errors
- Unknown functions
- Missing arguments
- Invalid argument values
- Unknown input variables

### Default formula

```plaintext
(rating-average (object type object-id))
```

It can be altered to limit the vote consideration to a limited time span, 30 days for example.

### Recent votes only

```plaintext
(rating-average
  (object type object-id)
  (range (mul 3600 24 30))
)
```

In the language, spaces do not matter. Only the parenthesis indicate structure. `rating-average` is a function that fetches the ratings for a given object. `type` and `object-id` are standard variables fed when calculating a rating. `object` and `range` are configuration options of the function.

`mul` is a mathematical function. `(mul 3600 24 30)` is equivalent to `3600*24*30`.

The functions can be combined in various ways. For example, we could calculate a score that considers the votes from the past month, but gives extra emphasis on the recent ones.

### Combined vote duration

```plaintext
(add
  (rating-average
    (object type object-id)
    (range (mul 3600 24 30))
  )
  ...
)
```
Even though the votes are 1-5, the final score can be on an entirely different scale. The language is also extensible if the calculation needs to be combined with other factors or weight. See Rating Language.

All available options are documented in the following section.

**Syntax**

**General Reference**

**Sample and use case**

---

### add (Sum)

Performs a simple sum accepting multiple input

**Examples**

<table>
<thead>
<tr>
<th>Example</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>(add 3 4)</td>
<td>7</td>
</tr>
<tr>
<td>(add (add 3 4) 5)</td>
<td>12</td>
</tr>
<tr>
<td>(add 3 4 5)</td>
<td>12</td>
</tr>
<tr>
<td>(add 4 0.5)</td>
<td>4.5</td>
</tr>
</tbody>
</table>

### sub (Substract)

Performs a simple substraction accepting multiple input

**Examples**

<table>
<thead>
<tr>
<th>Example</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>(sub 3 4)</td>
<td>-1</td>
</tr>
<tr>
<td>(sub (sub 3 4) 5)</td>
<td>-6</td>
</tr>
<tr>
<td>(sub 3 4 5)</td>
<td>-6</td>
</tr>
<tr>
<td>(sub 4 0.5)</td>
<td>3.5</td>
</tr>
</tbody>
</table>
**div (Divide)**
Performs a simple division accepting multiple input values.

**Examples**
- `(div 3 4)`
  -> 0.75
- `(div (mul 3 10) 5)`
  -> 6
- `(div 30 5 3)`
  -> 2
- `(div 4 0.5)`
  -> 8

**mul (Multiply)**
Performs a simple multiplication accepting multiple input values.

**Examples**
- `(mul 3 4)`
  -> 12
- `(mul (mul 3 4) 5)`
  -> 60
- `(mul 3 4 5)`
  -> 60
- `(mul 4 0.5)`
  -> 2

**and / or**

**and**
Ensures all elements evaluate to true.

**Examples**
- `(and 3 2 1 2 3)`
  -> 1
- `(and 2 3 0 2)`
  -> 0

**or**
Ensures that at least one element evaluates to true. Elements are evaluated sequentially until a false element is found. Others are left unevaluated.

**Examples**
- `(or 3 2 1 2 3)`
  -> 1
- `(or 2 3 0 2)`
  -> 1
- `(or 0 0)`
avg
Calculates the average of multiple values. All entries in the list will be flattened if arrays are present.

Examples
(avg 1 2 3)
--> 2
... given list contains [1, 2, 3]
(avg list)
--> 2

clean
Clean accents and special characters from a string of text, replacing the accented characters with the non-accented equivalent where possible. Added in Tiki 18.2

Examples
(clean (str foó barça caña))
--> "foo barca cana"

coalesce
Returns the first non-empty value from the list.

Examples
(coalesce 3 4)
--> -3
(coalesce (sub 3 3) 5)
--> 5
(coalesce 0 0 (str) -10)
--> -10
(coalesce 0 0 0 0)
--> 0

comment
Any comment block is stripped from the formula at parse-time

Examples
(mul
  1
  2
  (comment Simple enough?))
--> 2

concat
Concatenates a string of text. (new in Tiki12)
Note: The quoted string syntax was included in Tiki13.

Examples
(concat
  (str $)
  1234
)
  -> "$1234"
(concat
  14
  (str %)
)
  -> "14%"
(concat 14 "%")
  -> "14%"

contains
Searches for a value within a vector of values (new in Tiki15.0, backported to Tiki14.2 and Tiki12.5).

Examples
(contains 4 (1,2) )
  -> 0
(contains 4 (2,4) )
  -> 1

Note that if you are using an argument value in here, you would need to eval and then put brackets around to make it work.

args.values_by_permname.version: 305,306
(contains 307 (eval(args.values_by_permname.version)))
  -> 0
(contains 305 (eval(args.values_by_permname.version)))
  -> 1
(contains 30 (eval(args.values_by_permname.version)))
  -> 0

count
Returns the total number of entries within an array passed as argument.

Examples
(count results)
  -> 5

Currency
New in Tiki20: https://sourceforge.net/p/tikiwiki/code/71175
Allows to convert a calculation into currency field. Expects 3 arguments. First is the calculation of the amount. Second is the source currency - i.e. which currency is the amount in? Third is the currency field.
Examples
(currency (cal-of-the-amount) (sourceCurrency) currencyFieldPermName)

sourceCurrency can be retrieved from currencyFieldPermName using this formula:
(substring currencyFieldPermName -3)

Examples
(currency (cal-of-the-amount) (substring currencyFieldPermName -3) currencyFieldPermName)

date


Takes two optional arguments, format and timestamp and uses the PHP date function. See here for reference. Format defaults to "U" which is the Unix timestamp, and the timestamp defaults to "now".

Date Examples
(date)
> Returns "1438358437" currently

(date (str Y-m-d H:i:s))
> Returns "2015-07-31 17:00:43" currently

(date (str r) theTimeAndTheDate)
> Returns "Tue, 16 Jun 2015 09:23:09 +0100" for instance, where theTimeAndTheDate is the permanent name of a tracker field in the same tracker.

equals

Compares multiple values.

Examples
(equals 2 (add 1 1) (sub 4 2))
-> 1 (equivalent of 2 == 1+1 && 2 == 4-2)
(equals (add 1 1) 3)
-> 0

for-each

For a list of value pairs, such as the output of split-list, evaluates a formula for each set of values, returns the list of results.

Within the formula, variables coming from the list will be used first. Fallback will be on the other variables available in the execution context.

As of Tiki18, list items can be the output of ItemsList tracker field where individual formula fields are the linked fields from the other tracker. See example below.

Examples
... given items contains [{a: 1, b: 2, c: 3}, {a: 2, b: 3, c: 4}]
(for-each
  (list items)
  (formula (mul a b c)))
-> [6, 24]

... given items contains [{a: 1, b: 2, c: 3}, {a: 2, b: 3, c: 4}]
... and d contains 10
(for-each
  (list items)
  (formula (mul c d)))
-> [30, 40]

... given trackerDetails is an ItemsList field pointing to another tracker with a field detailsAmount
... and particular tracker item has 2 linked items with detailsAmount = 30 and 40
(add
  (for-each
    (list trackerDetails)
    (formula (concat detailsAmount))))
-> 70
This formula sums the detailsAmount column from the other tracker for all items linked from this tracker's item.

**hash**
Generates a hash based on multiple values. Used primarily to generate aggregate hashes in the Activity Stream. Note that because it is a hash, the exact value coming out does not matter. Only that given the same parameter, it will produce the same value.

**Examples**
(hash 1)
-> [sha1("1")]
(hash 1 2 3 4)
-> [sha1("1/2/3/4")]
(hash 1 2 (map (a 3) (b 4)))
-> [sha1("1/2/3/4")]

**if**
Conditionally evaluates a branch.

**Examples**
(if (equals 2 2) 42 -1)
-> 42
(if (equals 2 1) 42 -1)
-> -1

**IsEmpty**
*New in Tiki14: https://sourceforge.net/p/tikiwiki/code/53588*
Examples
(IsEmpty 1)
  -> 0
(IsEmpty 0)
  -> 1

IsEmpty may also be used to test if an array is empty.
You can also use a tracker field permaname as true or false value or as returned value from the tracker item however in some case you may have an error. coalesce seems to work better for testing and displaying tracker field values.

less / more

less-than
New in Tiki14.1 and Tiki12.5: Checks whether the first value is less than the second.

Examples
(less-than 3 (add 2 2) )
  -> 1
(less-than (add 2 2) 3)
  -> 0

more-than
New in Tiki14.1 and Tiki12.5: Checks whether the first value is more than the second.

Examples
(more-than 3 (add 2 2) )
  -> 0
(more-than (add 2 2) 3)
  -> 1

map
Generates a map (or dictionary).

Examples
(map
  (key1 1)
  (key2 2)
  (key3 (str value3))
)
  -> {"key1": 1, "key2": 2, "key3": "value3"}

Not
New in Tiki14: https://sourceforge.net/p/tikiwiki/code/53590
number-format

Format a number with grouped thousands. See PHP's number_format function for exact arguments. New in Tiki18.

Examples
(number-format 123456.78)
  -> "123,456.78"
(number-format 120.334 (str 3))
  -> "120.334"
(number-format 120.334 (str 0))
  -> "120"
(number-format 123456.78 (str 2) (str ,) (str ))
  -> "123 456,78"

pad

*New in Tiki15 committed in r57094*

Takes two to four arguments, input string, output length, padding string (defaults to a space) and padding type (defaults to right)

This example right pads prices in a simple products tracker for sorting and filtering
(pad
  productsPrice
  8
  (str 0)
  (str left)
)

round

Rounds to a specific number of digits (new in Tiki12)

Examples
(round 4.556234342234 2)
  -> 4.56
(round 4.556234342234)
  -> 5

str

Generates a static string when needed and the processor attempts to process the string as a variable. Any arguments will be concatenated using spaces.

**Note:** The quoted string syntax was included in Tiki13.

Examples
(str hello-world)
  -> "hello-world"
(str hello world)  
  -> "hello world"
(str hello  
  world  
  foobar)  
  -> "hello world foobar"
(str (mul 2 3) "= 6")  
  -> "6 = 6"
(str some text with new line-nl-)  
  -> "some text with new line\n"

str-to-time
Parse about any English textual datetime description into a Unix timestamp. See PHP's strtotime function for more details on valid formats and options. New in Tiki18.

**Examples**

(str-to-time (str 2017-06-05))  
  -> "1496610000"
(date (str Y-m-d) (str-to-time (str +1 day) (str 2017-05-29)))  
  -> "2017-05-30"

str-replace
Replace substring in a string. See PHP's str_replace function for exact arguments. New in Tiki18.

**Examples**

(str-replace (str foo) (str bar) (str hello foo))  
  -> "hello bar"

split-list
Produces a multi-dimensional array out of a text string. Each line is expected to be an independent value, each line will be split by a separator into the specified keys.

**Examples**

... given str contains a list of 3 comma-separated values
(split-list  
  (content str)  
  (separator ,)  
  (keys a b c))  
  -> [{a: 1, b: 2, c: 3}, {a: 2, b: 3, c: 4}]

subtotal
Special function to aggregate data in a table. See Report formatting for more details.
Advanced Rating-specific Reference
rating-average and rating-sum

The rating functions calculate the score from the rating history table. Each rating performed on the site is kept in the database and can be used to calculate custom ratings on. The various options allow to adapt the score calculation to reflect the importance on the site, whether it is to support quality improvement on documentation or to rank incoming data on a feed aggregator.

- **object**, mandatory and always \((object \ type \ object-id)\) in this context.
- **range**, to limit how long votes are considered. Argument is provided as a number of seconds.
- **ignore**, with \(anonymous\) as an argument to only consider votes from registered users.
- **keep**, to only consider one vote per visitor. Unless the option is present, all of the votes are taken into account. The option can be either \(latest\) or \(oldest\) to indicate which one to keep.
- **revote** can be specified if **keep** is specified. Indicates the time period required between votes. For example, users could be allowed to vote more than once per day, but only their latest vote each day would be considered, if revote is set to mul(24 3600). If the user voted yesterday as well as today, both votes will be counted.

**article-info**

Pulls information from an article to include in the calculation. The first argument must always resolve to 'article'. If any other value, the calculation will be skipped for the evaluated object, making the formula type-specific.

Available properties:

- rating, the static rating attached to the article
- view-count
- age-second
- age-hour
- age-day
- age-week
- age-month

**Examples**

(article-info \(type\) \(object-id\) rating)

(article-info \(str\) article 42 age-month)

**attribute**

Pulls information from the generic object attributes.

**Examples**

(attribute
  (object \(type\) \(object-id\))
  (property tiki.proposal.accept)
)
-> [value for page in a rating calculation]
(attribute
 (object (str wiki page) 14)
 (property tiki.proposal.accept)
 (default 0)
)
-> [value for page id 14]

tracker-field
Pulls information from the tracker item. The field value is converted to numeric value automatically. Zero is provided if the value is not found or unapplicable.

Examples
(tracker-field (object (str trackeritem) priority)

-> [value contained in the tracker item field with permanent name ''priority'']

You can pull the value of an item coming from an item link and an item dynamic list field type (not tested on item list). This imply using the permaname of the item link tracker field and the permaname of the field that contain the value (in the other tracker).

value form item link item
(tracker-field
 (object (str trackeritem) permaname_thistrackerfield)
 (field permaname_othertrackerfield)
)

category-present
Gives 1 in score of every listed category present on the object.

Examples
(category-present
 (object type object-id)
 (list 3 4)
)

-> [0, 1 or 2 - Depending on how many of categories 3 or 4 are on the object]

Appendix
When unified search is used, recalculation can be configured to be done during re-indexing, removing the need for this script.

Cron job
<?php
chdir('/path/to/tikiroot');
require_once 'tiki-setup.php';
Sample and use case

Calculate date difference to see if tracker item is new or not

In this use case we compare a field that contains creation date to the actual date and if the difference is lower than 7 days (604800) the field will have the value "new" else "notnew".

Examples

(if(equals (more-than 604800 (sub (add (date) 0) (add dateDeCrAtion 0))) 1) (str new) (str notnew))

Using Concat to create a reference made of month and string value from other fields

In this use case we concatenate the month as word from a date field and a value from a text field (can be a dropdown, etc) and we use to create a reference for this item. Then the result, the value, can be used for many things like populating an itemList field, filtering, searching, etc.

Filling a field with value for type and month

(concat trackerPermanameType (str " | ") (date (str F) trackerPermanameDate))

For example it will set the value of field with : "Credit | February"

Simple Wiki Ratings

Related

- Rating
- Rating Revamp
- Mathematical Calculation Tracker Field