Package ‘riskmetric’

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Author R Validation Hub [aut],
    Doug Kelkhoff [aut, cre],
    Marly Gotti [aut],
    Eli Miller [aut],
    Kevin K [aut],
    Yilong Zhang [aut],
    Eric Milliman [aut],
    Juliane Manitz [aut],
    Mark Padgham [ctb],
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Maintainer Doug Kelkhoff <doug.kelkhoff@gmail.com>
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**all_assessments**

* A default list of assessments to perform for each package

**Description**

A default list of assessments to perform for each package

**Usage**

```r
all_assessments()
```

**Value**

a list of assess_* functions exported from riskmetric

**assessment_error_as_warning**

* Error handler for assessments to deescalate errors to warnings

**Description**

Error handler for assessments to deescalate errors to warnings

**Usage**

```r
assessment_error_as_warning(e, name, assessment)
```

**Arguments**

- `e`: an error raised during a package reference assessment
- `name`: the name of the package whose package reference assessment raised the error
- `assessment`: the name of the assessment function which raised the error

**Value**

a pkg_metric object of pkg_metric_error subclass

**See Also**

Other assessment error handlers: `assessment_error_empty()`, `assessment_error_throw()`
---

**assessment_error_empty**

_Error handler for assessments with safe fallback_

---

**Description**

Error handler for assessments with safe fallback

**Usage**

`assessment_error_empty(e, ...)`

**Arguments**

- `e`: an error raised during a package reference assessment
- `...`: additional arguments unused

**Value**

a pkg_metric object of pkg_metric_error subclass

**See Also**

Other assessment error handlers: `assessment_error_as_warning()`, `assessment_error_throw()`

---

**assessment_error_throw**

_Error handler for assessments to throw error immediately_

---

**Description**

Error handler for assessments to throw error immediately

**Usage**

`assessment_error_throw(e, name, assessment)`

**Arguments**

- `e`: an error raised during a package reference assessment
- `name`: the name of the package whose package reference assessment raised the error
- `assessment`: the name of the assessment function which raised the error

**Value**

the error encountered during assessment
assess_covr_coverage

See Also

Other assessment error handlers: assessment_error_as_warning(), assessment_error_empty()
assess_export_help

Arguments

x  a pkg_ref package reference object
... additional arguments passed on to S3 methods, rarely used

Details

The more times a package has been downloaded the more extensive the user testing and the greater chance there is of someone finding a bug and logging it.

Value

a pkg_metric containing a numeric value between [0,1] indicating the volume of downloads

See Also

metric_score.pkg_metric_downloads_1yr

Examples

assess_downloads_1yr(pkg_ref("riskmetric"))

assess_export_help  Assess a package for availability of documentation for exported values

Description

Assess a package for availability of documentation for exported values

Usage

assess_export_help(x, ...)

Arguments

x  a pkg_ref package reference object
... additional arguments passed on to S3 methods, rarely used

Value

a pkg_metric containing a logical vector indicating existence of documentation for each namespace export

See Also

metric_score.pkg_metric_export_help

Examples

assess_export_help(pkg_ref("riskmetric"))
assess_has_bug_reports_url

Assess a package for the presence of a url field where bugs can be reported.

Description

Assess a package for the presence of a url field where bugs can be reported.

Usage

assess_has_bug_reports_url(x, ...)

Arguments

x a pkg_ref package reference object
...
additional arguments passed on to S3 methods, rarely used

Value

a pkg_metric containing a character value containing the BugReports field contents

See Also

metric_score.pkg_metric_has_bug_reports_url

Examples

assess_has_bug_reports_url(pkg_ref("riskmetric"))

assess_has_maintainer

Assess a package for an associated maintainer

Description

Assess a package for an associated maintainer

Usage

assess_has_maintainer(x, ...)

Arguments

x a pkg_ref package reference object
...
additional arguments passed on to S3 methods, rarely used
assess_has_news

Assess a package for the presence of a NEWS file

Description
Assess a package for the presence of a NEWS file

Usage
assess_has_news(x, ...)

Arguments

x a pkg_ref package reference object
...
additional arguments passed on to S3 methods, rarely used

Value
a pkg_metric containing an integer value indicating the number of discovered NEWS files

See Also
metric_score.pkg_metric_has_news

Examples
assess_has_news(pkg_ref("riskmetric"))
assess_has_source_control

Assess a package for an associated source control url

Description
Assess a package for an associated source control url

Usage
assess_has_source_control(x, ...)

Arguments
x           a pkg_ref package reference object
...         additional arguments passed on to S3 methods, rarely used

Value
a pkg_metric containing a character vector of source control urls associated with the package

See Also
metric_score.pkg_metric_has_source_control

Examples
assess_has_source_control(pkg_ref("riskmetric"))

assess_has_vignettes
Assess a package for the presence of Vignettes files

Description
Assess a package for the presence of Vignettes files

Usage
assess_has_vignettes(x, ...)

Arguments
x           a pkg_ref package reference object
...         additional arguments passed on to S3 methods, rarely used
assess_has_website

Value

a pkg_metric containing an integer value indicating the number of discovered vignettes files

See Also

metric_score.pkg_metric_has_vignettes

Examples

assess_has_vignettes(pkg_ref("riskmetric"))

assess_has_website

Assess a package for an associated website url

Description

Assess a package for an associated website url

Usage

assess_has_website(x, ...)

Arguments

x

a pkg_ref package reference object

... additional arguments passed on to S3 methods, rarely used

Value

a pkg_metric containing a character vector of website urls associated with the package

See Also

metric_score.pkg_metric_has_website

Examples

assess_has_website(pkg_ref("riskmetric"))
assess_last_30_bugs_status

Assess how many recent BugReports have been closed

Description
Assess how many recent BugReports have been closed

Usage
assess_last_30_bugs_status(x, ...)

Arguments
x  a pkg_ref package reference object
... additional arguments passed on to S3 methods, rarely used

Value
a pkg_metric containing a logical vector indicating whether a recent BugReport was closed

See Also
metric_score.pkg_metric_last_30_bugs_status

Examples
## Not run:
assess_last_30_bugs_status(pkg_ref("riskmetric"))
## End(Not run)

assess_license  

Assess a package for an acceptable license

Description
Assess a package for an acceptable license

Usage
assess_license(x, ...)

Arguments
x  a pkg_ref package reference object
... additional arguments passed on to S3 methods, rarely used
assess_news_current

Value

A `pkg_metric` containing a string indicating the license under which the package is released.

See Also

`metric_score.pkg_metric_license`

Examples

```r
assess_license(pkg_ref("riskmetric"))
```

---

assess_news_current  Assess a package for an up-to-date NEWS file

Description

Assess a package for an up-to-date NEWS file.

Usage

```r
assess_news_current(x, ...)
```

Arguments

- `x`: A `pkg_ref` package reference object.
- `...`: Additional arguments passed on to S3 methods, rarely used.

Value

A `pkg_metric` containing a logical vector indicating whether each discovered NEWS file is up-to-date.

See Also

`metric_score.pkg_metric_news_current`

Examples

```r
assess_news_current(pkg_ref("riskmetric"))
```
assess_remote_checks  Assess package checks from CRAN/Bioc or R CMD check

Description
Assess package checks from CRAN/Bioc or R CMD check

Usage
assess_remote_checks(x, ...)

Arguments
x a pkg_ref package reference object
... additional arguments passed on to S3 methods, rarely used

Value
a pkg_metric containing Tally of R CMD check results run on different OS flavors by BioC or CRAN

See Also
metric_score.pkg_metric_remote_checks

Examples
## Not run:
assess_remote_checks(pkg_ref("riskmetric"))
## End(Not run)

assess_r_cmd_check  Assess a package’s results from running R CMD check

Description
Assess a package’s results from running R CMD check

Usage
assess_r_cmd_check(x, ...)

Arguments
x a pkg_ref package reference object
... additional arguments passed on to S3 methods, rarely used
get_pkg_ref_classes

Value

a pkg_metric containing Tally of errors, warnings and notes from running R CMD check locally

See Also

metric_score.pkg_metric_r_cmd_check

Examples

## Not run:
assess_r_cmd_check(pkg_ref("riskmetric"))
## End(Not run)

as_pkg_metric    Convert an object to a pkg_metric

Description

Convert an object to a pkg_metric

Usage

as_pkg_metric(x, class = c())

Arguments

x              data to store as a pkg_metric
class          a subclass to differentiate the pkg_metric object

Value

a pkg_metric object

get_pkg_ref_classes   Walk the pkg_ref class hierarchy to match a single subclass to a class path

Description

Walk the pkg_ref class hierarchy to match a single subclass to a class path

Usage

get_pkg_ref_classes(x, classes = pkg_ref_class_hierarchy)
metric_score

Arguments

x ('character(1L)') A subclass, among those known in pkg_ref subclasses
classes ('list') A class hierarchy, described using a named list. Defaults to 'pkg_ref_class_hierarchy'.

Value

A 'character(n)' class path from 'pkg_ref' down to the specified subclass, or 'FALSE' if no path is found.

Description

Convert a package metric into a numeric value between 0 to 1

Usage

metric_score(x, ...)

Arguments

x A pkg_metric_* class object to score
...

Value

score of a package risk metric

metric_score.pkg_metric_covr_coverage

Score a package for unit test coverage

Description

Returns the overall test coverage from a covr coverage report

Usage

## S3 method for class 'pkg_metric_covr_coverage'
metric_score(x, ...)

Arguments

x a pkg_metric_covr_coverage package metric object
...

additional arguments unused
### metric_score.pkg_metric_downloads_1yr

**Defining an Assessment Scoring Function**

**Description**

Score a package for the number of downloads in the past year regularized. Convert the number of downloads \(x\) in the past year into a validation score \([0,1]\)

\[
1 - \frac{150,000}{x + 150,000}
\]

**Usage**

```r
## S3 method for class 'pkg_metric_downloads_1yr'
metric_score(x, ...)
```

**Arguments**

- **x**
  - a `pkg_metric_downloads_1yr` package metric object
- **...**
  - additional arguments unused

**Details**

The scoring function is a simplification of the classic logistic curve

\[
\frac{1}{1 + \exp(-k(x - x[0]))}
\]

with a log scale for the number of downloads \(x = \log(x)\), sigmoid midpoint is 1000 downloads, ie. \(x[0] = \log(1000)\), and logistic growth rate of \(k = 0.5\).

\[
1 - 1/(1 + \exp(\log(x) - \log(1.5e5))) = 1 - \frac{150,000}{x + 150,000}
\]

**Value**

numeric value between 0 (low) and 1 (high download volume) converting the number of downloads.

**Examples**

```r
metric_score(assess_downloads_1yr(pkg_ref("riskmetric")))
```
Description

Score a package for availability of documentation for exported values

Usage

```r
## S3 method for class 'pkg_metric_export_help'
metric_score(x, ...)
```

Arguments

- `x`: a `pkg_metric_export_help` package metric object
- `...`: additional arguments unused

Value

1 if any NEWS files are found, otherwise 0

Examples

```r
metric_score(assess_export_help(pkg_ref("riskmetric")))
```

Description

Score a package for the presence of a bug report url

Usage

```r
## S3 method for class 'pkg_metric_has_bug_reports_url'
metric_score(x, ...)
```

Arguments

- `x`: a `pkg_metric_has_bug_reports_url` package metric object
- `...`: additional arguments unused
Value

A logical value indicating whether the package has a BugReports field filled in.

Examples

```r
metric_score(assess_has_bug_reports_url(pkg_ref("riskmetric")))
```

---

**metric_score.pkg_metric_has_maintainer**

Score a package for inclusion of an associated maintainer

Description

Coerce a list of maintainers into a numeric value indicating whether the number of listed maintainers is greater than 0.

Usage

```r
## S3 method for class 'pkg_metric_has_maintainer'
metric_score(x, ...)
```

Arguments

- `x`: a `pkg_metric_has_maintainer` package metric object
- `...`: additional arguments unused

Value

1 if any maintainer is provided, otherwise 0

Examples

```r
metric_score(assess_has_maintainer(pkg_ref("riskmetric")))
```
metric_score.pkg_metric_has_news

Score a package for the presence of a NEWS file

Description

Coerce the number of news files to binary indication of valid NEWS files

Usage

```r
## S3 method for class 'pkg_metric_has_news'
metric_score(x, ...)
```

Arguments

- `x` a pkg_metric_has_news package metric object
- `...` additional arguments unused

Value

1 if any NEWS files are found, otherwise 0

Examples

```r
metric_score(assess_has_news(pkg_ref("riskmetric")))
```

metric_score.pkg_metric_has_source_control

Score a package for inclusion of an associated source control url

Description

Coerce a list of source control urls into a numeric value indicating whether the number of listed urls is greater than 0.

Usage

```r
## S3 method for class 'pkg_metric_has_source_control'
metric_score(x, ...)
```

Arguments

- `x` a pkg_metric_has_source_control package metric object
- `...` additional arguments unused
**Value**

1 if any source control url is provided, otherwise 0

**Examples**

```r
metric_score(assess_has_source_control(pkg_ref("riskmetric")))
```

---

**metric_score.pkg_metric_has_vignettes**

*Score a package for the presence of a Vignettes file*

**Description**

Coerce the number of vignettes files to binary indication of valid Vignettes

**Usage**

```r
## S3 method for class 'pkg_metric_has_vignettes'
metric_score(x, ...)
```

**Arguments**

- `x` a `pkg_metric_has_vignettes` package metric object
- `...` additional arguments unused

**Value**

1 if any Vignettes files are found, otherwise 0

**Examples**

```r
metric_score(assess_has_vignettes(pkg_ref("riskmetric")))
```

---

**metric_score.pkg_metric_has_website**

*Score a package for inclusion of an associated website url*

**Description**

Coerce a list of website urls into a numeric value indicating whether the number of listed urls is greater than 0.

**Usage**

```r
## S3 method for class 'pkg_metric_has_website'
metric_score(x, ...)
```
**metric_score.pkg_metric_last_30_bugs_status**

**Arguments**

- `x` a pkg_metric_has_website pkg metric object
- `...` additional arguments unused

**Value**

1 if any website url is provided, otherwise 0

**Examples**

```
metric_score(assess_has_website(pkg_ref("riskmetric")))
```

---

**metric_score.pkg_metric_last_30_bugs_status**

`Score a package for number of recently opened BugReports that are now closed`

**Description**

Score a package for number of recently opened BugReports that are now closed

**Usage**

```r
## S3 method for class 'pkg_metric_last_30_bugs_status'
metric_score(x, ...)
```

**Arguments**

- `x` a pkg_metric_last_30_bugs_status pkg metric object
- `...` additional arguments unused

**Value**

a fractional value indicating percentage of last 30 bug reports that are now closed

**Examples**

```r
## Not run: metric_score(assess_last_30_bugs_status(pkg_ref("riskmetric")))
```
**metric_score.pkg_metric_license**

*Score a package for acceptable license*

**Description**
Maps a license string to a score

**Usage**
```r
## S3 method for class 'pkg_metric_license'
metric_score(x, ...)
```

**Arguments**
- `x`: a `pkg_metric_license` package metric object
- `...`: additional arguments unused

**Value**
Score of metric license

**Examples**
```r
metric_score(assess_license(pkg_ref("riskmetric")))
```

---

**metric_score.pkg_metric_news_current**

*Score a package for NEWS files updated to current version*

**Description**
Coerce a logical vector of discovered up-to-date NEWS to a metric score

**Usage**
```r
## S3 method for class 'pkg_metric_news_current'
metric_score(x, ...)
```

**Arguments**
- `x`: a `pkg_metric_news_current` package metric object
- `...`: additional arguments unused
metric_score.pkg_metric_remote_checks

Value

1 if any NEWS files are up-to-date, otherwise 0

Examples

metric_score(assess_news_current(pkg_ref("riskmetric")))

metric_score.pkg_metric_remote_checks

Score a package based on R CMD check results run by BioC or CRAN

Description

The scoring function is the number of OS flavors that passed with OK or NOTES + 0.5*the number of OS’s that produced WARNINGS divided by the number of OS’s checked

Usage

## S3 method for class 'pkg_metric_remote_checks'
metric_score(x, ...)

Arguments

x 
  a pkg_metric_remote_checks package metric object

... 
  additional arguments unused

Value

a fractional value indicating percentage OS flavors that did not produce an error or warning from R CMD check

Examples

## Not run: metric_score(assess_remote_checks(pkg_ref("riskmetric")))
## Description

The scoring function is

### Usage

```r
## S3 method for class 'pkg_metric_r_cmd_check'
metric_score(x, ...)
```

### Arguments

- `x`: a `pkg_metric_r_cmd_check` package metric object
- `...`: additional arguments unused

### Value

A weighted sum of errors and warnings of all tests preformed

### Examples

```r
## Not run: metric_score(assess_r_cmd_check(pkg_ref("riskmetric")))
```

---

## pkg_assess

### Description

By default, use all `assess_*` functions in the `riskmetric` namespace and produce a `tibble` with one column per assessment applied.

### Usage

```r
pkg_assess(
x,
  assessments = all_assessments(),
  ...,  
  error_handler = assessment_error_empty
)
```
pkg_metric

Arguments

- **x**: A single `pkg_ref` object or `tibble` of package references to assess.
- **assessments**: A list of assessment functions to apply to each package reference. By default, a list of all exported `assess_*` functions from the riskmetric package.
- **...** additional arguments unused
- **error_handler**: A function, which accepts a single parameter expecting the raised error, which will be called if any errors occur when attempting to apply an assessment function.

Value

A `tibble` with one row per package reference and a new column per assessment function, with cells of that column as package metric objects returned when the assessment was called with the associated package reference.

Assessment function catalog

- `assess_remote_checks`: Number of OS flavors that passed/warned/errored on R CMD check
- `assess_has_news`: number of discovered NEWS files
- `assess_last_30_bugs_status`: vector indicating whether BugReports status is closed
- `assess_export_help`: exported objects have documentation
- `assess_downloads_1yr`: number of downloads in the past year
- `assess_has_website`: a vector of associated website urls
- `assess_has_source_control`: a vector of associated source control urls
- `assess_license`: software is released with an acceptable license
- `assess_news_current`: NEWS file contains entry for current version number
- `assess_covr_coverage`: Package unit test coverage
- `assess_r_cmd_check`: Package check results
- `assess_has_maintainer`: a vector of associated maintainers
- `assess_has_vignettes`: number of discovered vignettes files
- `assess_has_bug_reports_url`: presence of a bug reports url in repository

---

pkg_metric

A helper for structuring assessment return objects for dispatch with the score function

Description

A helper for structuring assessment return objects for dispatch with the score function

Usage

```r
pkg_metric(x = NA, ..., class = c())
```
pkg_ref

Arguments

x  data to store as a pkg_metric
...
additional attributes to bind to the pkg_metric object
class a subclass to differentiate the pkg_metric object

Value

a pkg_metric object

Description

Create a package reference from package name or filepath, producing an object in which package metadata will be collected as risk assessments are performed. Depending on where the package was found - whether it is found as source code, in a local library or from a remote host - an S3 subclass is given to allow for source-specific collection of metadata. See 'Details' for a breakdown of subclasses. Different sources can be specified by passing a subclass as an argument named 'source', see details.

Usage

pkg_ref(x, ...)

pkg_install(x, lib.loc = NULL)

pkg_source(x)

pkg_cran(x, repos = getOption("repos", "https://cran.rstudio.com"))

pkg_bioc(x)

pkg_missing(x)

pkg_library(lib.loc)

as_pkg_ref(x, ...)

Arguments

x  A singular character value, character vector or list of character values of package names or source code directory paths.
...
Additional arguments passed to methods.
lib.loc The path to the R library directory of the installed package.
repos URL of CRAN repository to pull package metadata.
Details

Package reference objects are used to collect metadata pertaining to a given package. As data is needed for assessing a package's risk, this metadata populates fields within the package reference object.

The pkg_ref S3 subclasses are used extensively for divergent metadata collection behaviors dependent on where the package was discovered. Because of this, there is a rich hierarchy of subclasses to articulate the different ways package information can be found.

A source argument can be passed using the ‘source’ argument. This will override the logic that riskmetric does when determining a package source. This can be useful when you are scoring the most recent version present on a repository, or testing a specific library.

- pkg_ref A default class for general metadata collection.
  - pkg_source A reference to a source code directory.
  - pkg_install A reference to a package installation location in a package library. A specific library can be passed by passing the path to the library as the parameter ‘lib.loc’
  - pkg_remote A reference to package metadata on a remote server.
    * pkg_cran_remote A reference to package information pulled from the CRAN repository.
    * pkg_bioc_remote A reference to package information pulled from the Bioconductor repository.
    * pkg_git_remote A reference to a package source code git repository. (not yet implemented)

Value

When a single value is provided, a single pkg_ref object is returned, possibly with a subclass based on where the package was found. If a vector or list is provided, a list_of_pkg_ref object constructed with list_of is returned, which can be considered analogous to a list. See 'Details' for further information about pkg_ref subclasses.

Package Cohorts

*Experimental!* Package cohorts are structures to determine the risk of a set of packages. ‘pkg_library()’ can be called to create a object containing the pkg_ref objects of all packages in a system library.

Examples

```r
# riskmetric will check for installed packages by default
ref_1 <- pkg_ref("utils")
ref_1$source # returns 'pkg_install'

# You can also override this behavior with a source argument
ref_2 <- pkg_ref("utils", source = "pkg_cran_remote")
ref_2$source # returns 'pkg_cran_remote'

# lib.loc can be used to specify a library for pkg_install
ref_3 <- pkg_ref("utils", source = "pkg_install", lib.loc = .libPaths()[1])
```
pkg_ref_cache.r_cmd_check.pkg_source

*Run R CMD check and capture the results*

---

**Description**

Run R CMD check and capture the results

**Usage**

```r
## S3 method for class 'r_cmd_check.pkg_source'
pkg_ref_cache(x, ...)
```

**Arguments**

- `x` a package reference object
- `...` additional arguments used for computing cached values

**Value**

a pkg_ref object

---

pkg_ref_class_hierarchy

*The 'pkg_ref' subclass hierarchy, used for pkg_ref object creation with a specified subclass*

---

**Description**

The 'pkg_ref' subclass hierarchy, used for pkg_ref object creation with a specified subclass

**Usage**

```r
pkg_ref_class_hierarchy
```

**Format**

An object of class list of length 1.
**pkg_score**

Score a package assessment, collapsing results into a single numeric

### Description

pkg_score() calculates the risk involved with using a package. Risk ranges from 0 (low-risk) to 1 (high-risk).

### Usage

pkg_score(x, ..., error_handler = score_error_default)

### Arguments

- **x**: A pkg_metric object, whose subclass is used to choose the appropriate scoring method for the atomic metric metadata. Optionally, a tibble can be provided, in which cases all pkg_metric values will be scored.
- **...**: Additional arguments passed to summarize_scores when an object of class tbl_df is provided, unused otherwise.
- **error_handler**: Specify a function to be called if the class can’t be identified. Most commonly this occurs for pkg_metric objects of subclass pkg_metric_error, which is produced when an error is encountered when calculating an associated assessment.

### Value

A numeric value if a single pkg_metric is provided, or a tibble with pkg_metric objects scored and returned as numeric values when a tibble is provided.

### See Also

score_error_default score_error_zero score_error_NA

### Examples

```r
# scoring a single assessment
metric_score(assess_has_news(pkg_ref("riskmetric")))

# scoring many assessments as a tibble
## Not run:
library(dplyr)
pkg_score(pkg_assess(as_tibble(pkg_ref(c("riskmetric", "riskmetric")))))
## End(Not run)
```
### score_error_default

*Default score error handling, emitting a warning and returning 0*

**Description**

Default score error handling, emitting a warning and returning 0

**Usage**

```
score_error_default(x, ...)
```

**Arguments**

- `x` A `pkg_metric_*` class object to score
- `...` Additional arguments unused

**Value**

A value of package score

### score_error_NA

*Score error handler to silently return NA*

**Description**

Score error handler to silently return NA

**Usage**

```
score_error_NA(...)
```

**Arguments**

- `...` Additional arguments unused

**Value**

A value of package score
**score_error_zero**

Score error handler to silently return 0

**Description**

Score error handler to silently return 0

**Usage**

```r
score_error_zero(...)  
```

**Arguments**

... Additional arguments unused

**Value**

a value of package score

---

**summarize_scores**

Summarize a default set of assessments into a single risk score

**Description**

This function serves as an example for how a risk score might be derived. Assuming all assessments provided by `riskmetric` are available in a dataset, this function can be used to calculate a vector of risks.

**Usage**

```r
summarize_scores(data, weights = NULL)  
```

**Arguments**

- `data` a tibble of scored assessments whose column names match those provided by `riskmetric`'s `pkg_assess` function.
- `weights` an optional vector of non-negative weights to be assigned to each assessment.

**Value**

a numeric vector of risk scores
Examples

```r
## Not run:
library(dplyr)
summarize_scores(pkg_score(pkg_assess(as_tibble(pkg_ref("riskmetric"))))))
## End(Not run)

# or, using the cleaner dplyr syntax
## Not run:
library(dplyr)
pkg_ref("riskmetric") %>%
  pkg_assess() %>%
  pkg_score() %>%
  summarize_scores()
## End(Not run)
```
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