Package 'JDCruncheR'

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Type Package

Title Interface Between the 'JDemetra+' Cruncher and R, and Quality Report Generator

Version 0.3.1

Description Tool for generating quality reports from cruncher outputs (and calculating series scores). The latest version of the cruncher can be downloaded here: <https://github.com/jdemetra/jwsacruncher/releases>.

URL https://github.com/InseeFr/JDCruncheR,

https://inseefr.github.io/JDCruncheR/

BugReports https://github.com/InseeFr/JDCruncheR/issues

Imports openxlsx, stats, tools, utils

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Contents

`add_indicator` *Adding an indicator in QR_matrix objects*

Description

Function to add indicators in `QR_matrix` objects.

Usage

```
add_indicator(x, indicator, variable_name, ...)
```

Arguments

`x`	a `QR_matrix` or `mQR_matrix` object
`indicator`	a `vector` or a `data.frame` (cf. details).
`variable_name`	a string containing the name of the variables to add.
`...`	other parameters of the function `merge`.

Details

The function `add_indicator()` adds the chosen indicator to the values matrix of a quality report. Therefore, because said indicator isn't added in the modalities matrix, it cannot be used to calculate a score (except for weighting). Before using the added variable for score calculation, it will have to be coded with the function `recode_indicator_num`.

The new indicator can be a `vector` or a `data.frame`. In both cases, its format must allow for pairing:

- a `vector`'s elements must be named and these names must match those of the quality report (variable "series");
- a `data.frame` must contain a "series" column that matches with the quality report's series.

Value

This function returns the same object, enhanced with the chosen indicator. So if the input `x` is a QR_matrix, an object of class `QR_matrix` is returned. If the input `x` is a mQR_matrix, an object of class `mQR_matrix` is returned.

See Also

Traduction française

Other var QR_matrix manipulation: `QR_var_manipulation`, `recode_indicator_num()`

`compute_score` *Score calculation*

Description

To calculate a score for each series from a quality report

Usage

```
## S3 method for class 'QR_matrix'
compute_score(
  x,
 score_pond = c(qs_residual_sa_on_sa = 30, f_residual_sa_on_sa = 30, qs_residual_sa_on_i
  = 20, f_residual_sa_on_i = 20, f_residual_td_on_sa = 30, f_residual_td_on_i = 20,
  oos_mean = 15, oos_mse = 10, residuals_independency = 15, residuals_homoskedasticity
    = 5, residuals_skewness = 5, m7 = 5, q_m2 = 5),
  modalities = c("Good", "Uncertain", "", "Bad", "Severe"),
  normalize_score_value,
  na.rm = FALSE,
  n_contrib_score,
  conditional_indicator,
  ...
)

## S3 method for class 'mQR_matrix'
compute_score(x, ...)
```

Arguments

x	a QR_matrix or mQR_matrix object.
score_pond	the formula used to calculate the series score.
modalities	modalities ordered by importance in the score calculation (cf. details).
normalize_score_value	integer indicating the reference value for weights normalisation. If missing, weights will not be normalised.
na.rm	logical indicating whether missing values must be ignored when calculating the score.
n_contrib_score	integer indicating the number of variables to create in the quality report's values matrix to store the n_contrib_score greatest contributions to the score (cf. details). If not specified, no variable is created.
conditional_indicator	a list containing 3-elements sub-lists: "indicator", "conditions" and "condition_modalities". To reduce down to 1 the weight of chosen indicators depending on other variables' values (cf. details).
...	other unused parameters.

Details

The function compute_score calculates a score from the modalities of a quality report: to each modality corresponds a weight that depends on the parameter modalities. The default parameter is c("Good", "Uncertain", "Bad","Severe"), and the associated weights are respectively 0, 1, 2 and 3.

The score calculation is based on the score_pond parameter, which is a named integer vector containing the weights to apply to the (modalities matrix) variables. For example, with score_pond = c(qs_residual_sa_on_sa = 10, f_residual_td_on_sa = 5), the score will be based on the variables qs_residual_sa_on_sa and f_residual_td_on_sa. The qs_residual_sa_on_sa grades will be multiplied by 10 and the f_residual_td_on_sa grades, by 5. To ignore the missing values when calculating a score, use the parameter na.rm = TRUE.

The parameter normalize_score_value can be used to normalise the scores. For example, to have all scores between 0 and 20, specify normalize_score_value = 20.

When using parameter n_contrib_score, n_contrib_score new variables are added to the quality report's values matrix. These new variables store the names of the variables that contribute the most to the series score. For example, n_contrib_score = 3 will add to the values matrix the three variables that contribute the most to the score. The new variables' names are *i*_highest_score, with *i* being the rank in terms of contribution to the score (1_highest_score contains the name of the greatest contributor, 2_highest_score the second greatest, etc). Only the variables that have a non-zero contribution to the score are taken into account: if a series score is 0, all *i*_highest_score variables will be empty. And if a series score is positive only because of the m7 statistic, 1_highest_score will have a value of "m7" for this series and the other *i*_highest_score will be empty.

Some indicators are only relevant under certain conditions. For example, the homoscedasticity test is only valid when the residuals are independant, and the normality tests, only when the residuals are both independant and homoscedastic. In these cases, the parameter conditional_indicator

can be of use since it reduces the weight of some variables down to 1 when some conditions are met. `conditional_indicator` is a `list` of 3-elements sub-lists:

- "indicator": the variable whose weight will be conditionally changed
- "conditions": the variables used to define the conditions
- "conditions_modalities": modalities that must be verified to induce the weight change For example, `conditional_indicator = list(list(indicator = "residuals_skewness", conditions = c("residuals_independency", "residuals_homoskedasticity"), conditions_modalities = c("Bad","Severe")))`, reduces down to 1 the weight of the variable "residuals_skewness" when the modalities of the independancy test ("residuals_independency") or the homoscedasticity test ("residuals_homoskedasticity") are "Bad" or "Severe".

Value

a `QR_matrix` or `mQR_matrix` object.

See Also

Traduction française

Examples

```
# Path of matrix demetra_m
demetra_path <- file.path(
    system.file("extdata", package = "JDCruncheR"),
    "WS/ws_ipi/Output/SAProcessing-1",
    "demetra_m.csv"
)

# Extract the quality report from the demetra_m file
QR <- extract_QR(demetra_path)

# Calculer le score
QR <- compute_score(QR, n_contrib_score = 2)
print(QR)

# Extract the modalities matrix:
QR$modalities$score
```

`export_xlsx` *Exporting QR_matrix or mQR_matrix objects in an Excel file*

Description

Exporting QR_matrix or mQR_matrix objects in an Excel file

Usage

```
export_xlsx(x, ...)
```

Arguments

x	a QR_matrix or mQR_matrix object.
...	other parameters of the function export_xlsx.QR_matrix.

Value

If x is a mQR_matrix, the function returns invisibly (via invisible(x)) the same mQR_matrix object as x. Else if x is a QR_matrix, the function returns invisibly (via invisible(x)) a workbook object created by XLConnect::loadWorkbook() for further manipulation.

See Also

Other QR_matrix functions: export_xlsx.QR_matrix(), export_xlsx.mQR_matrix(), extract_QR(), rbind.QR_matrix(), sort(), weighted_score()

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export_xlsx.mQR_matrix

Exporting mQR_matrix objects in Excel files

Description

To export several quality reports in Excel files

Usage

```
## S3 method for class 'mQR_matrix'
export_xlsx(
  x,
  export_dir,
  layout_file = c("ByComponent", "ByQRMatrix", "AllTogether"),
  auto_format = TRUE,
  overwrite = TRUE,
  ...
)
```

Arguments

x	a mQR_matrix object to export.
export_dir	export directory.
layout_file	export parameter. By default, (layout_file = "ByComponent") and an Excel file is exported for each part of the quality report matrix (modalities and values matrices). To group both modalities and values reports/sheets into a single Excel file, use the option layout_file = "ByQRMatrix".
auto_format	logical indicating whether to format the output (auto_format = TRUE by default).

overwrite	logical indicating whether to create an Excel file if it doesn't exist yet (create = TRUE by default)
...	other unused arguments

Value

Returns invisibly (via invisible(x)) the same mQR_matrix object as x.

See Also

Traduction française

Other QR_matrix functions: export_xlsx(), export_xlsx.QR_matrix(), extract_QR(), rbind.QR_matrix(), sort(), weighted_score()

---

export_xlsx.QR_matrix *Exporting QR_matrix objects in an Excel file*

Description

To export a quality report in an Excel file.

Usage

```
## S3 method for class 'QR_matrix'
export_xlsx(x, file, auto_format = TRUE, overwrite = TRUE, ...)
```

Arguments

x	a QR_matrix object.
file	a character object with the path to the file to export que l'on veut créer
auto_format	logical indicating whether to format the output (auto_format = TRUE by default).
overwrite	logical indicating whether to create an Excel file if it doesn't exist yet (create = TRUE by default)
...	other unused arguments

Value

Returns invisibly (via invisible(x)) a workbook object created by XLConnect::loadWorkbook() for further manipulation.

See Also

Traduction française

Other QR_matrix functions: export_xlsx(), export_xlsx.mQR_matrix(), extract_QR(), rbind.QR_matrix(), sort(), weighted_score()

`extract_QR` *Extraction of a quality report*

Description

To extract a quality report from the csv file containing the diagnostics matrix.

Usage

```
extract_QR(matrix_output_file, sep = ";", dec = ",")
```

Arguments

`matrix_output_file`	the csv file containing the diagnostics matrix.
`sep`	the separator used in the csv file (by default, `sep = ";"`)
`dec`	the decimal separator used in the csv file (by default, `dec = ","`)

Details

This function generates a quality report from a csv file containing diagnostics (usually from the file *demetra_m.csv*). The *demetra_m.csv* file can be generated by launching the cruncher (functions `cruncher` or `cruncher_and_param`) with the default export parameters, having used the default option `csv_layout = "vtable"` to format the output tables of the functions `cruncher_and_param` and `create_param_file` when creating the parameters file.

This function returns a `QR_matrix` object, which is a list of 3 objects:

- `modalities`, a `data.frame` containing several indicators and their categorical quality (Good, Uncertain, Bad, Severe).
- `values`, a `data.frame` containing the same indicators and the values that lead to their quality category (i.e.: p-values, statistics, etc.) as well as additional variables that don't have a modality/quality (series frequency and arima model).
- `score_formula` that will store the formula used to calculate the score (when relevant). Its initial value is `NULL`.

Value

a `QR_matrix` object.

See Also

Traduction française

Other QR_matrix functions: `export_xlsx()`, `export_xlsx.QR_matrix()`, `export_xlsx.mQR_matrix()`, `rbind.QR_matrix()`, `sort()`, `weighted_score()`

Examples

```
# Path of matrix demetra_m
demetra_path <- file.path(
    system.file("extdata", package = "JDCruncheR"),
    "WS/ws_ipi/Output/SAProcessing-1",
    "demetra_m.csv"
)

# Extract the quality report from the demetra_m file
QR <- extract_QR(demetra_path)

print(QR)

# Extract the modalities matrix:
QR$modalities
# Or:
QR[["modalities"]]
```

`extract_score` *Score extraction*

Description

To extract score variables from `QR_matrix` or `mQR_matrix` objects.

Usage

```
extract_score(
  x,
  format_output = c("data.frame", "vector"),
  weighted_score = FALSE
)
```

Arguments

`x`	a `QR_matrix` or `mQR_matrix`.
`format_output`	string of characters indicating the output format: either a `data.frame` or a `vector`.
`weighted_score`	logical indicating whether to extract the weighted score (if previously calculated) or the unweighted one. By default, the unweighted score is extracted.

Details

For `QR_matrix` objects, the output is a vector or the object `NULL` if no score was previously calculated. For `mQR_matrix` objects, it is a list of scores (`NULL` elements or vectors).

Value

`extract_score()` returns a data.frame with two column: the series name and their score.

See Also

Traduction française

Examples

```
# Path of matrix demetra_m
demetra_path <- file.path(
    system.file("extdata", package = "JDCruncheR"),
    "WS/ws_ipi/Output/SAProcessing-1",
    "demetra_m.csv"
)

# Extract the quality report from the demetra_m file
QR <- extract_QR(demetra_path)

# Compute the score
QR1 <- compute_score(x = QR, n_contrib_score = 5)
QR2 <- compute_score(
    x = QR,
    score_pond = c(qs_residual_sa_on_sa = 5, qs_residual_sa_on_i = 30,
                   f_residual_td_on_sa = 10, f_residual_td_on_i = 40,
                   oos_mean = 30, residuals_skewness = 15, m7 = 25)
)
mQR <- mQR_matrix(list(a = QR1, b = QR2))

# Extract score
extract_score(QR1)
extract_score(mQR)
```

---

get_thresholds *Get all (default) thresholds*

Description

Get all (default) thresholds

Usage

```
get_thresholds(test_name, default = TRUE)
```

Arguments

`test_name`	String. The name of the test to get.
`default`	Boolean. (default is TRUE) If TRUE, the default threshold will be returned. If FALSE the current used thresholds.

Details

If `test_name` is missing, all threshold will be returned.

Examples

```
# Get all default thresholds
get_thresholds(default = TRUE)

# Get all current thresholds
get_thresholds(default = FALSE)

# Get all current thresholds
get_thresholds(test_name = "oos_mean", default = FALSE)
```

`print.QR_matrix` *Printing QR_matrix and mQR_matrix objects*

Description

To print information on a QR_matrix or mQR_matrix object.

Usage

```
## S3 method for class 'QR_matrix'
print(x, print_variables = TRUE, print_score_formula = TRUE, ...)

## S3 method for class 'mQR_matrix'
print(x, score_statistics = TRUE, ...)
```

Arguments

`x`	a `mQR_matrix` or `mQR_matrix` object.
`print_variables`	logical indicating whether to print the indicators' name (including additionnal variables).
`print_score_formula`	logical indicating whether to print the formula with which the score was calculated (when calculated).
`...`	other unused arguments.
`score_statistics`	logical indicating whether to print the statistics in the `mQR_matrix` scores (when calculated).

Value

the `print` method prints a `mQR_matrix` or `mQR_matrix` object and returns it invisibly (via `invisible(x)`).

See Also

Traduction française

`QR_matrix` *Quality report objects*

Description

`mQR_matrix()` and `QR_matrix()` are creating one (or several) quality report. The function `is.QR_matrix()` and `is.mQR_matrix()` are functions to test whether an object is a quality report or a list of quality reports.

Usage

```
QR_matrix(modalities = NULL, values = NULL, score_formula = NULL)

mQR_matrix(x = list(), ...)

is.QR_matrix(x)

is.mQR_matrix(x)
```

Arguments

`modalities`	a `data.frame` containing the output variables' modalities (Good, Bad, etc.)
`values`	a `data.frame` containing the output variables' values (test p-values, test statistics, etc.) Therefore, the values data frame can contain more variables than the data frame `modalities`.
`score_formula`	the formula used to calculate the series score (if defined).
`x`	a `QR_matrix` object, a `mQR_matrix` object or a list of `QR_matrix` objects.
`...`	objects of the same type as `x`.

Details

A`QR_matrix` object is a list of three items:

- `modalities`, a `data.frame` containing a set of categorical variables (by default: Good, Uncertain, Bad, Severe).
- `values`, a `data.frame` containing the values corresponding to the `modalities` indicators (i.e. p-values, statistics, etc.), as well as variables for which a modality cannot be defined (e.g. the series frequency, the ARIMA model, etc).
- `score_formula` contains the formula used to calculate the series score (once the calculus is done).

Value

QR_matrix() creates and returns a QR_matrix object. mQR_matrix() creates and returns a mQR_matrix object (ie. a list of QR_matrix objects). is.QR_matrix() and is.mQR_matrix() return Boolean values (TRUE or FALSE).

See Also

Traduction française

QR_var_manipulation *Editing the indicators list*

Description

Functions to remove indicators (remove_indicators()) or retrain some indicators only (retain_indicators()) from QR_matrix or mQR_matrix objects. The series names (column "series") cannot be removed.

Usage

```
remove_indicators(x, ...)

retain_indicators(x, ...)
```

Arguments

x	a QR_matrix or mQR_matrix object.
...	names of the variable to remove (or keep)

Value

remove_indicators() returns the same object x reduced by the flags and variables used as arguments ... So if the input x is a QR_matrix, an object of class QR_matrix is returned. If the input x is a mQR_matrix, an object of class mQR_matrix is returned.

See Also

Traduction française

Other var QR_matrix manipulation: add_indicator(), recode_indicator_num()

Examples

```
# Path of matrix demetra_m
demetra_path <- file.path(
    system.file("extdata", package = "JDCruncheR"),
    "WS/ws_ipi/Output/SAProcessing-1",
    "demetra_m.csv"
)
```

```
# Extract the quality report from the demetra_m file
QR <- extract_QR(demetra_path)

# Compute the score
QR <- compute_score(QR, n_contrib_score = 2)

# Retain indicators
retain_indicators(QR, "score", "m7") # retaining "score" and "m7"
retain_indicators(QR, c("score", "m7")) # Same

# Remove indicators
QR <- remove_indicators(QR, "score") # removing "score"

extract_score(QR) # is NULL because we removed the score indicator
```

`rbind.QR_matrix` *Combining QR_matrix objects*

Description

Function to combine multiple `QR_matrix` objects: line by line, both for the `modalities` and the `values` table.

Usage

```
## S3 method for class 'QR_matrix'
rbind(..., check_formula = TRUE)
```

Arguments

`...`	`QR_matrix` objects to combine.
`check_formula`	logical indicating whether to check the score formulas' coherency. By default, `check_formula = TRUE`: an error is returned if the scores were calculated with different formulas. If `check_formula = FALSE`, no check is performed and the `score_formula` of the output is `NULL`.

Value

`rbind.QR_matrix()` returns a `QR_matrix` object.

See Also

Traduction française

Other QR_matrix functions: `export_xlsx()`, `export_xlsx.QR_matrix()`, `export_xlsx.mQR_matrix()`, `extract_QR()`, `sort()`, `weighted_score()`

Examples

```
# Path of matrix demetra_m
demetra_path <- file.path(
    system.file("extdata", package = "JDCruncheR"),
    "WS/ws_ipi/Output/SAProcessing-1",
    "demetra_m.csv"
)

# Extract the quality report from the demetra_m file
QR <- extract_QR(demetra_path)

# Compute differents scores
QR1 <- compute_score(QR, score_pond = c(m7 = 2, q = 3, qs_residual_sa_on_sa = 5))
QR2 <- compute_score(QR, score_pond = c(m7 = 2, qs_residual_sa_on_sa = 5))

# Merge two quality report
try(rbind(QR1, QR2)) # Une erreur est renvoyée
rbind(QR1, QR2, check_formula = FALSE)
```

---

recode_indicator_num *Converting "values variables" into "modalities variables"*

Description

To transform variables from the values matrix into categorical variables that can be added into the modalities matrix.

Usage

```
recode_indicator_num(
  x,
  variable_name,
  breaks = c(0, 0.01, 0.05, 0.1, 1),
  labels = c("Good", "Uncertain", "Bad", "Severe"),
  ...
)
```

Arguments

x	a QR_matrix or mQR_matrix object.
variable_name	a vector of strings containing the names of the variables to convert.
breaks	see function cut.
labels	see function cut.
...	other parameters of the cut function.

Value

The function `recode_indicator_num()` returns the same object, enhanced with the chosen indicator. So if the input `x` is a QR_matrix, an object of class `QR_matrix` is returned. If the input `x` is a mQR_matrix, an object of class `mQR_matrix` is returned.

See Also

Traduction française

Other var QR_matrix manipulation: `QR_var_manipulation`, `add_indicator()`

`set_thresholds` *Set values for thresholds*

Description

Set values for thresholds

Usage

```
set_thresholds(test_name, thresholds)
```

Arguments

`test_name`	String. The name of the test to update.
`thresholds`	Named vector of numerics. The upper values of each break of a threshold.

Details

If `test_name` is missing, the argument `thresholds` is not used and all thresholds will be updated to their default values.

If `test_name` is not missing, but if the argument `thresholds` is missing then only the thresholds of the test `test_name` will be updated to its default values.

Finally, if `test_name` and `thresholds` are not missing, then only the thresholds of the test `test_name` are updated with the value `thresholds`.

Examples

```
# Set "m7"
set_thresholds(
    test_name = "m7",
    thresholds = c(Good = 0.8, Bad = 1.4, Severe = Inf)
)

# Set "oos_mean" to default
set_thresholds(test_name = "oos_mean")

# Set all thresholds to default
```

```
set_thresholds()
```

`sort` *QR_matrix and mQR_matrix sorting*

Description

To sort the quality reports on one or several variables

Usage

```
## S3 method for class 'QR_matrix'
sort(x, decreasing = FALSE, sort_variables = "score", ...)

## S3 method for class 'mQR_matrix'
sort(x, decreasing = FALSE, sort_variables = "score", ...)
```

Arguments

`x`	a `QR_matrix` or `mQR_matrix` object
`decreasing`	logical indicating whether the quality reports must be sorted in ascending or decreasing order. By default, the sorting is done in ascending order.
`sort_variables`	They must be present in the modalities table.
`...`	other parameters of the function `order` (unused for now)

Value

the input with sorted quality reports

See Also

Traduction française

Other QR_matrix functions: `export_xlsx()`, `export_xlsx.QR_matrix()`, `export_xlsx.mQR_matrix()`, `extract_QR()`, `rbind.QR_matrix()`, `weighted_score()`

Examples

```
# Path of matrix demetra_m
demetra_path <- file.path(
    system.file("extdata", package = "JDCruncheR"),
    "WS/ws_ipi/Output/SAProcessing-1",
    "demetra_m.csv"
)

# Extract the quality report from the demetra_m file
QR <- extract_QR(demetra_path)
```

```
# Compute the score
QR <- compute_score(QR, n_contrib_score = 2)
print(QR$modalities$score)

# Sort the scores

# To sort by ascending scores
QR <- sort(QR, sort_variables = "score")
print(QR$modalities$score)
```

`weighted_score` *Weighted score calculation*

Description

Function to weight a pre-calculated score

Usage

```
weighted_score(x, pond = 1)
```

Arguments

x	a `QR_matrix` or `mQR_matrix` object
pond	the weights to use. Can be an integer, a vector of integers, the name of one of the quality report variables or a list of weights for the `mQR_matrix` objects.

Value

the input with an additionnal weighted score

See Also

Traduction française

Other QR_matrix functions: `export_xlsx()`, `export_xlsx.QR_matrix()`, `export_xlsx.mQR_matrix()`, `extract_QR()`, `rbind.QR_matrix()`, `sort()`

Examples

```
# Path of matrix demetra_m
demetra_path <- file.path(
    system.file("extdata", package = "JDCruncheR"),
    "WS/ws_ipi/Output/SAProcessing-1",
    "demetra_m.csv"
)

# Extract the quality report from the demetra_m file
```

```
QR <- extract_QR(demetra_path)

# Compute the score
QR <- compute_score(QR, n_contrib_score = 2)

# Weighted score
QR <- weighted_score(QR, 2)
print(QR)

# Extract the weighted score
QR$modalities$score_pond
```

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