Package 'psyverse'

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```
Type Package
```

Title Decentralized Unequivocality in Psychological Science

Version 0.2.4

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License GPL (>= 3)

Description The constructs used to study the human psychology have many definitions and corresponding instructions for eliciting and coding qualitative data pertaining to constructs' content and for measuring the constructs. This plethora of definitions and instructions necessitates unequivocal reference to specific definitions and instructions in empirical and secondary research. This package implements a human- and machine-readable standard for specifying construct definitions and instructions for measurement and qualitative research based on 'YAML'. This standard facilitates systematic unequivocal reference to specific construct definitions and corresponding instructions in a decentralized manner (i.e. without requiring central curation; Peters (2020) <doi:10.31234/osf.io/xebhn>).

BugReports https://gitlab.com/r-packages/psyverse/-/issues

URL https://psyverse.one

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apply_graph_theme

Apply multiple DiagrammeR global graph attributes

Description

Apply multiple DiagrammeR global graph attributes

Usage

```
apply_graph_theme(dctGraph, ...)
```

Arguments

dctGraph

The DiagrammeR::DiagrammeR graph to apply the attributes to.

. . .

One or more character vectors of length three, where the first element is the attribute, the second the value, and the third, the attribute type (graph, node, or edge).

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Value

The DiagrammeR::DiagrammeR graph.

Examples

base30toNumeric

Conversion between base10 and base30 & base36

Description

The conversion functions from base10 to base30 are used by the generate_id() functions; the base36 functions are just left here for convenience.

Usage

```
base30toNumeric(x)
base36toNumeric(x)
numericToBase30(x)
numericToBase36(x)
```

Arguments

Χ

The vector to convert (numeric for the numericTo functions, character for the base30to and base36to funtions).

Details

The symbols to represent the 'base 30' system are the 0-9 followed by the alphabet without vowels but including the y. This vector is available as base 30.

Value

The converted vector (numeric for the base30to and base36to funtions, character for the numericTo functions).

Examples

```
numericToBase30(654321);
base30toNumeric(numericToBase30(654321));
```

cat0

Concatenate to screen without spaces

Description

The cat0 function is to cat what paste0 is to paste; it simply makes concatenating many strings without a separator easier.

Usage

```
cat0(..., sep = "")
```

Arguments

... The character vector(s) to print; passed to cat.

sep The separator to pass to cat, of course, "" by default.

Value

Nothing (invisible NULL, like cat).

Examples

```
cat0("The first variable is '", names(mtcars)[1], "'.");
```

Description

This function reads a spreadsheet (from a Google sheet URL or a local file in .xlsx, .csv, or .sav format) and imports the DCT specifications in it.

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Usage

```
dct_from_spreadsheet(
    x,
    path = NULL,
    sheet = NULL,
    localBackup = NULL,
    exportGoogleSheet = TRUE,
    xlsxPkg = c("rw_x1", "openxlsx", "XLConnect"),
    preventOverwriting = psyverse::opts$get("preventOverwriting"),
    encoding = psyverse::opts$get("encoding"),
    silent = psyverse::opts$get("silent")
)
```

Arguments

x The URL or path to a file.

path The path to save the DCT specifications.

sheet Optionally, the name(s) of the worksheet(s) to select.

localBackup If not NULL, a valid filename to write a local backup to.

exportGoogleSheet

If x is a URL to a Google Sheet, instead of using the googlesheets4 package to download the data, by passing exportGoogleSheet=TRUE, an export link will

be produced and the data will be downloaded as Excel spreadsheet.

xlsxPkg Which package to use to work with Excel spreadsheets.

preventOverwriting

Whether to prevent overwriting.

encoding The encoding to use.

silent Whether to be silent or chatty.

Value

Invisibly, an object with the worksheets and the DCT objects.

dct_object Create a DCT object

Description

Create a DCT object

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Usage

```
dct_object(
  version = as.character(utils::packageVersion("psyverse")),
  id = NULL,
  prefix = paste(sample(letters, 4), collapse = ""),
  label = "",
  date = as.character(Sys.Date()),
  dct_version = "1",
 ancestry = "",
retires = "",
  definition = "",
 measure_dev = ""
 measure_code = "",
  aspect_dev = "",
  aspect_code = "",
  comments = "",
  rel = NULL
)
```

Arguments

version	The version of the DCT specification format (normally the version of the psyverse package).
id	The Unique Construct Identifier (UCID); if not provided, this is created using the prefix.
prefix	The prefix to use to construct the Unique Construct Identifier (UCID); ignored i id is provided.
label	The human-readable label for the construct.
date	The date at which the construct was created.
dct_version	The version of the DCT specification. This can optionally be used to manage consecutive DCT versions.
ancestry	The DCT specification or specifications that this DCT was based on.
retires	The DCT specification or specifications that this DCT renders obsolete (note that this doesn't mean anything in itself; psyverse does not enforce this automatically, nor does PsyCoRe, without configuration).
definition	The definition of the construct. This has to be comprehensive, detailed, accurate, and clearly delineate the relevant aspects of the human psychology.
measure_dev	Instructions for developing measurement instruments that measure this construct.
measure_code	Instructions for coding measurement instruments (e.g. in systematic reviews) as measurement instruments that measure this construct. Note that explicitly defin-

ing boundary conditions often helps, for example by explaining the features that coders should look for to distinguish this construct from closely related constructs (ideally linking to those other constructs using the dct:UCID notations).

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aspect_dev Instructions for eliciting construct content. Note that this is not sensible for all

constructs; some may be defined at a very general level, rendering their content

insufficiently specific to discuss or describe.

aspect_code Instructions for coding construct content (i.e. aspects). Note that explicitly

defining boundary conditions often helps, for example by explaining the features that coders should look for to distinguish this construct from closely related constructs (ideally linking to those other constructs using the dct:UCID

notations).

comments Any additional comments.

rel Relationships with other constructs.

Value

The DCT object.

Examples

```
exampleDCT <-
psyverse::dct_object(
   prefix = "exampleConstruct",
   label = "An example construct",
   definition = "The definition goes here",
   measure_dev = "Here you can explain how to measure the construct"
);</pre>
```

dct_object_to_html

Create an HTML fragment showing a DCT object

Description

Create an HTML fragment showing a DCT object

```
dct_object_to_html(
  dctObject,
  headingLevel = 3,
  hyperlink_UCIDs = TRUE,
  collapseButtons = TRUE,
  urlPrefix = "#",
  sortDecreasing = FALSE
)
```

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Arguments

dctObject The DCT object

headingLevel The level of the heading in the Markdown output that is produces.

hyperlink_UCIDs

Whether to create hyperlinks to UCIDs.

collapseButtons

Whether to include buttons to show/hide the definition and instructions.

urlPrefix The prefix to insert before the URL in the produced hyperlink. The default, "#",

results in a link to an anchor (an HTML a element) on the current page.

sortDecreasing Whether to sort the constructs in decreasing order (TRUE), in increasing order

(FALSE), or not at all (NULL).

Value

A character vector.

Examples

```
exampleDCT <-
  psyverse::dct_object(
    prefix = "exampleConstruct",
    label = "An example construct",
    definition = "The definition goes here",
    measure_dev = "Here you can explain how to measure the construct"
  );
### Only run this in an interactive R session,
### as it shows the HTML in the viewer.
if (interactive()) {
    dct_object_to_html(exampleDCT);
}</pre>
```

dct_object_to_yaml

Convert a DCT object to YAML

Description

Convert a DCT object to YAML

Usage

```
dct_object_to_yaml(dctObject)
```

Arguments

dctObject The DCT object

Value

A character vector.

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dct_sheet_to_dct

Create a DCT object from a DCT sheet

Description

Create a DCT object from a DCT sheet

Usage

```
dct_sheet_to_dct(dct_sheet)
```

Arguments

dct_sheet

A dataframe containing a DCT specification.

Value

A DCT created by dct_object().

```
generate_construct_overview
```

Generate construct overviews and instruction overviews

Description

These functions use a DCT specification to generate a construct overview or an instruction overview.

```
generate_construct_overview(
  dctSpec,
  include = c("definition", "measure_dev", "measure_code", "manipulate_dev",
    "manipulate_code", "aspect_dev", "aspect_code", "rel"),
  hideByDefault = NULL,
  divClass = "btn btn-secondary",
  headingLevel = 3,
  collapseButtons = TRUE,
  hyperlink_UCIDs = TRUE,
 HTMLoutput = FALSE,
  urlPrefix = "#",
  sortDecreasing = FALSE
)
generate_definitions_overview(
  dctSpecDf,
  headingLevel = 3,
```

```
hyperlink_UCIDs = "Markdown",
  urlPrefix = "#",
  sortDecreasing = FALSE
)

generate_instruction_overview(
  dctSpecDf,
  type,
  headingLevel = 3,
  hyperlink_UCIDs = "Markdown",
  urlPrefix = "#",
  sortDecreasing = FALSE
)
```

Arguments

dctSpec The DCT specification, as resulting from a call to load_dct_specs() or load_dct_dir().

include Which elements to include in the construct overview.

hideByDefault Which elements to hide by default.

divClass The class of the button to collapse/expand sections.

headingLevel The level of the heading in the Markdown output that is produces.

collapseButtons

Whether to include buttons to show/hide the definition and instructions.

hyperlink_UCIDs

Whether to create hyperlinks to UCIDs.

HTMLoutput Whether to output to Markdown (FALSE) or HTML (TRUE).

urlPrefix The prefix to insert before the URL in the produced hyperlink. The default, "#",

results in a link to an anchor (an HTML a element) on the current page.

sortDecreasing Whether to sort the constructs in decreasing order (TRUE), in increasing order

(FALSE), or not at all (NULL).

dctSpecDf The DCT specification dataframer, as produced by a call to load_dct_specs()

or load_dct_dir(), and stored within the resulting object.

type For instruction overviews, the type of instruction to generate can be specified:

must be one of "measure_dev", "measure_code", "manipulate_dev", "manipulate_code",

"aspect_dev", or "aspect_code".

Value

A character string with the overview.

Examples

```
exampleDCT <-
   psyverse::dct_object(
   prefix = "exampleConstruct",
   label = "An example construct",</pre>
```

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```
definition = "The definition goes here",
  measure_dev = "Here you can explain how to measure the construct"
);
generate_construct_overview(exampleDCT);
```

```
generate_dct_template DCT templates
```

Description

These functions can generate one or more empty DCT templates.

Usage

```
generate_dct_template(
   prefix = paste(sample(letters, 4), collapse = ""),
   output = NULL,
   overwrite = FALSE,
   createDirs = FALSE,
   addComments = TRUE,
   stopOnIllegalChars = FALSE
)

generate_dct_templates(
   x,
   outputDir = NULL,
   createDirs = FALSE,
   addComments = FALSE,
   stopOnIllegalChars = FALSE
)
```

Arguments

The filename or directory to which to write the templates.

overwrite Whether to overwrite any existing files.

createDirs Whether to recursively create the directories if the path specified in output or

outputPath does not yet exist.

addComments Whether to add comments to the DCT specification as extra explanation.

stopOnIllegalChars

DCT identifier prefixes can only contain upper- and lowercase letters and underscores. This argument specifies whether to remove illegal characters with a warning, or whether to throw an error (and stop) if illegal characters are found,

Value

The DCT template(s), either invisibly (if output or outputDir is specified) or visibly.

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generate_id

Generate unique identifier(s)

Description

To allow unique reference to constructs, they require unique identifiers. These functions generate such identifiers by combining one or more identifier prefixes (usually a human-readable construct name such as 'attitude') with a unique identifier based on the second the identifier was generated. The identifier prefix may only contain lowercase and uppercase letters and underscores.

Usage

```
generate_id(
  prefix = paste(sample(letters, 4), collapse = ""),
  stopOnIllegalChars = FALSE
)
generate_ids(x, stopOnIllegalChars = FALSE)
```

Arguments

```
prefix An identifier prefix.

stopOnIllegalChars

Whether to base::stop() or produce a base::warning() when encountering illegal characters (i.e. anything other than a letter or underscore).

x A vector of identifier prefixes.
```

Value

a character vector containing the identifier(s).

Examples

```
generate_id('attitude');
```

invert_id

Invert identifier

Description

Invert the identifier (generated by generate_id() for one or more constructs. This means that the identifier prefix is stripped and the last part is converted back from base 30 to base 10.

```
invert_id(x)
```

load_dct_dir

Arguments

Х

The identifier(s) as a character vector.

Value

The identifier(s) as a numeric vector.

Examples

```
invert_id(generate_id('example'));
```

load_dct_dir

Load DCT specifications from a file or multiple files

Description

These function load DCT specifications from the YAML fragments in one (load_dct_specs) or multiple files (load_dct_dir).

```
load_dct_dir(
  path,
  recursive = TRUE,
  extension = "\\.rock|\\.dct\\.yaml|\\.yaml|\\.yml",
  regex,
  dctContainer = "dct",
  headingLevel = 2,
  delimiterRegEx = "^---$",
  ignoreOddDelimiters = FALSE,
  encoding = "UTF-8",
  sortDecreasing = FALSE,
  silent = TRUE
)
load_dct_specs(
  text,
  file,
  delimiterRegEx = "^---$",
  dctContainer = "dct",
  headingLevel = 2,
  ignoreOddDelimiters = FALSE,
  encoding = "UTF-8",
  silent = TRUE
)
## S3 method for class 'dct_specs'
```

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```
print(x, ...)
## S3 method for class 'dct_specs'
plot(x, ...)
```

Arguments

path The path containing the files to read.

recursive Whether to also process subdirectories (TRUE) or not (FALSE).

extension The extension of the files to read; files with other extensions will be ignored.

Multiple extensions can be separated by a pipe (|).

regex Instead of specifing an extension, it's also possible to specify a regular expres-

sion; only files matching this regular expression are read. If specified, regex

takes precedece over extension,

dctContainer The container of the DCT specifications in the YAML fragments. Because only

DCT specifications are read that are stored in this container, the files can contain YAML fragments with other data, too, without interfering with the parsing of

the DCT specifications.

headingLevel The level of the Markdown headings that are produced.

delimiterRegEx The regular expression used to locate YAML fragments

ignoreOddDelimiters

Whether to throw an error (FALSE) or delete the last delimiter (TRUE) if an odd

number of delimiters is encountered.

encoding The encoding to use when calling readLines(). Set to NULL to let readLines()

guess.

sortDecreasing Whether to sort the constructs in decreasing order (TRUE), in increasing order

(FALSE), or not at all (NULL).

silent Whether to be silent (TRUE) or informative (FALSE).

text, file As text or file, you can specify a file to read with encoding encoding,

which will then be read using base::readLines(). If the argument is named text, whether it is the path to an existing file is checked first, and if it is, that file is read. If the argument is named file, and it does not point to an existing file, an error is produced (useful if calling from other functions). A text should be a character vector where every element is a line of the original source (like provided by base::readLines()); although if a character vector of one element and including at least one newline character (\\n) is provided as text, it is split at the newline characters using base::strsplit(). Basically, this behavior means that the first argument can be either a character vector or the path to a file; and if you're specifying a file and you want to be certain that an error is

thrown if it doesn't exist, make sure to name it file.

x The parsed parsed_dct object.

. . . Any other arguments are passed to the print command.

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Details

load_dct_dir simply identifies all files and then calls load_dct_specs for each of them. load_dct_specs loads the YAML fragments containing the DCT specifications using yum::load_yaml_fragments() and then parses the DCT specifications into a visual representation as a DiagrammeR::DiagrammeR graph and Markdown documents with the instructions for creating measurement instruments or manipulations, and for coding measurement instruments, manipulations, or aspects of a construct.

Value

An object with the DiagrammeR::DiagrammeR graph stored in output\$basic_graph, a DiagrammeR::DiagrammeR graph with a summary of which specifications are provided for each construct in output\$completeness_graph and the instructions in output\$instr.

Examples

opts

Options for the psyverse package

Description

The psyverse::opts object contains three functions to set, get, and reset options used by the escalc package. Use psyverse::opts\$set to set options, psyverse::opts\$get to get options, or psyverse::opts\$reset to reset specific or all options to their default values.

Usage

opts

Format

An object of class list of length 4.

parse_dct_specs

Details

It is normally not necessary to get or set psyverse options.

The following arguments can be passed:

... For psyverse::opts\$set, the dots can be used to specify the options to set, in the format option = value, for example, encoding = "UTF-8". For psyverse::opts\$reset, a list of options to be reset can be passed.

option For psyverse::opts\$set, the name of the option to set.

default For psyverse::opts\$get, the default value to return if the option has not been manually specified.

The following options can be set:

encoding The default encoding used to read or write files.

Examples

```
### Get the default encoding
psyverse::opts$get(encoding);

### Set it to UTF-8-BOM
psyverse::opts$set(encoding = "UTF-8-BOM");

### Check that it worked
psyverse::opts$get(encoding);

### Reset this option to its default value
psyverse::opts$reset(encoding);

### Check that the reset worked, too
psyverse::opts$get(encoding);
```

parse_dct_specs

Parse DCT specifications

Description

This function parses DCT specifications; it's normally called by load_dct_dir() or load_dct_specs(), so you won't have to use it directly.

```
parse_dct_specs(
  dctSpecs,
  headingLevel = 2,
  hyperlink_UCIDs = TRUE,
```

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```
urlPrefix = "#",
HTMLoutput = FALSE,
sortDecreasing = FALSE)
```

Arguments

dctSpecs The DCT specifications (a list).

headingLevel The heading level for Markdown output.

hyperlink_UCIDs, urlPrefix, HTMLoutput

Passed on to the generate_instruction_overview() and generate_construct_overview()

functions.

sortDecreasing Whether to sort the constructs in decreasing order (TRUE), in increasing order

(FALSE), or not at all (NULL).

Value

The object of parsed DCT specifications.

read_spreadsheet

Convenience function to read spreadsheet-like files

Description

Currently reads spreadsheets from Google Sheets or from xlsx, csv, or sav files. Normally, you don't use this, but instead you use dct_from_spreadsheet().

Usage

```
read_spreadsheet(
    x,
    sheet = NULL,
    columnDictionary = NULL,
    localBackup = NULL,
    exportGoogleSheet = TRUE,
    flattenSingleDf = FALSE,
    xlsxPkg = c("rw_xl", "openxlsx", "XLConnect"),
    failQuietly = FALSE,
    silent = psyverse::opts$get("silent")
)
```

Arguments

x The URL or path to a file.

sheet Optionally, the name(s) of the worksheet(s) to select.

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columnDictionary

Optionally, a dictionary with column names to check for presence. A named list of vectors.

localBackup

If not NULL, a valid filename to write a local backup to.

exportGoogleSheet

If x is a URL to a Google Sheet, instead of using the googlesheets4 package to download the data, by passing exportGoogleSheet=TRUE, an export link will be produced and the data will be downloaded as Excel spreadsheet.

flattenSingleDf

Whether to return the result as a data frame if only one data frame is returned as

a result.

xlsxPkg Which package to use to work with Excel spreadsheets.

failQuietly Whether to give an error when x is not a valid URL or existing file, or just return

NULL invisibly.

silent Whether to be silent or chatty.

Value

A list of dataframes, or, if only one data frame was loaded and flattenSingleDf is TRUE, a data frame.

Examples

```
### Note that this example requires an internet connection!
read_spreadsheet(
  paste0(
    "https://docs.google.com/",
    "spreadsheets/d/",
    "1bHDzpCu4CwEa5_3_q_9vH2691XPhCS3e4Aj_HLhw_U8"
  )
);
```

repeatStr

Repeat a string a number of times

Description

Repeat a string a number of times

```
repeatStr(n = 1, str = " ")
```

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Arguments

n, str

Normally, respectively the frequency with which to repeat the string and the string to repeat; but the order of the inputs can be switched as well.

Value

A character vector of length 1.

Examples

```
### 10 spaces:
repStr(10);
### Three euro symbols:
repStr("\u20ac", 3);
```

save_to_yaml

Save a psyverse object or YAML character vector to a file

Description

Pretty much what it says on the box. But check the bit about encoding.

Usage

```
save_to_yaml(
    x,
    file,
    preventOverwriting = psyverse::opts$get("preventOverwriting"),
    encoding = psyverse::opts$get("encoding")
)
```

Arguments

x The object to save.

file The file to save to.
preventOverwriting

Whether to prevent overwriting.

encoding

The encoding to use. Note that in general, encoding seems to have been invented primarily as a source of frustration, and it rarely disappoints. If unsure, use UTF-8. If using UTF-8, the approach from https://kevinushey.github.io/blog/2018/02/21/string-encoding-and-r/will be used.

Value

The character vector that was written to the file.

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vecTxt

Easily parse a vector into a character value

Description

Easily parse a vector into a character value

Usage

```
vecTxt(
  vector,
  delimiter = ", ",
  useQuote = "",
  firstDelimiter = NULL,
  lastDelimiter = " & ",
  firstElements = 0,
  lastElements = 1,
  lastHasPrecedence = TRUE
)

vecTxtQ(vector, useQuote = "'", ...)
```

Arguments

vector The vector to process.

delimiter, firstDelimiter, lastDelimiter

The delimiters to use for respectively the middle, first firstElements, and last lastElements elements.

useQuote

This character string is pre- and appended to all elements; so use this to quote all elements (useQuote="'"), doublequote all elements (useQuote='"'), or anything else (e.g. useQuote='|'). The only difference between vecTxt and vecTxtQ is that the latter by default quotes the elements.

firstElements, lastElements

The number of elements for which to use the first respective last delimiters

lastHasPrecedence

If the vector is very short, it's possible that the sum of firstElements and lastElements is larger than the vector length. In that case, downwardly adjust the number of elements to separate with the first delimiter (TRUE) or the number of elements to separate with the last delimiter (FALSE)?

... Any addition arguments to vecTxtQ are passed on to vecTxt.

Value

A character vector of length 1.

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Examples

```
vecTxtQ(names(mtcars));
```

viewHTML

Display HTML

Description

This function displays HTML in the viewer, adding <body> and <head> tags (which should therefore not be included in the fragment).

Usage

```
viewHTML(x, title = "Psyverse", css = "body {font-size: 16px;}")
```

Arguments

```
x The HTML fragment title The title CSS
```

Value

Invisibly, x, with the extra HTML bits added.

Examples

```
### Only run this example in an interactive R session,
### as it shows the HTML in the viewer.
if (interactive()) {
   psyverse::viewHTML("<strong>Hello world!</strong>");
}
```

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