

Package ‘ilabelled’

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Type Package

Title Simple Handling of Labelled Data

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Description Simple handling of survey data. Smart handling of meta-information like e.g. variable-labels value-labels and scale-levels. Easy access and validation of meta-information. Useage of value labels and values respectively for subsetting and recoding data.

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Suggests knitr, rmarkdown, testthat (>= 3.0.0)

Imports methods, stats

URL <https://github.com/clewerenz/ilabelled>

BugReports <https://github.com/clewerenz/ilabelled/issues>

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Contents

.init	3
.is_sequential	4
.i_find_in	5
.i_in	5

.merge_labels	6
.valid_annotation	6
.valid_label	7
.valid_labels	7
.valid_missing	8
.valid_scale	8
.valid_subject	9
.valid_wording	9
as.i_labelled	10
grapesingrapes	10
is.i_labelled	11
is_decimal	11
i_annotation	12
i_assert_labels	12
i_as_character	13
i_as_factor	13
i_as_numeric	14
i_copy	15
i_get_annotation	15
i_get_equal_subject	16
i_get_equal_wording	16
i_get_label	17
i_get_labels	17
i_get_na_range	18
i_get_na_values	18
i_get_scale	19
i_get_subject	19
i_get_wording	20
i_label	20
i_labelled	21
i_labels	22
i_missing_to_na	22
i_na_range	23
i_na_values	23
i_print_annotation	24
i_print_attributes	24
i_print_label	25
i_print_labels	25
i_print_na_range	26
i_print_na_values	26
i_print_scale	27
i_print_subject	27
i_print_wording	28
i_recode	28
i_remove_annotation	30
i_remove_label	30
i_remove_labels	31
i_remove_missing_labels	31

i_remove_na_range	32
i_remove_na_values	32
i_remove_scale	33
i_remove_subject	33
i_remove_wording	34
i_scale	34
i_sort_labels	35
i_subject	35
i_table	36
i_to_base_class	36
i_unclass	37
i_valid_annotation	38
i_valid_label	38
i_valid_labels	39
i_valid_scale	39
i_valid_subject	40
i_valid_wording	40
i_wording	41
print.i_labelled	41
[.i_labelled	42
[[.i_labelled	42

Index **43**

`.init` *backend for i_labelled*

Description

all arguments are passed from `i_labelled`

Usage

```
.init(
  x,
  label = NULL,
  labels = NULL,
  na_values = NULL,
  na_range = NULL,
  scale = NULL,
  annotation = NULL,
  wording = NULL,
  subject = NULL,
  ...
)
```

Arguments

x	vector
label	variable label
labels	value labels as named vector
na_values	missing values (e.g. c(888, 999))
na_range	range of missing values (e.g. c(-9,-1))
scale	scale level (nominal, ordinal, scale)
annotation	additional information about variable
wording	question text
subject	subject
...	further attributes passed to class

Value

x as *i_labelled* object with attributes applied to it

<i>.is_sequential</i>	<i>checks if vector is numeric sequence</i>
-----------------------	---

Description

checks if vector is numeric sequence

Usage

```
.is_sequential(x)
```

Arguments

x	vector
---	--------

Value

T/F

.i_find_in	<i>internal replacement of match function for remove missing values (match is much slower but can handle more data classes)</i>
------------	---

Description

description description

Usage

.i_find_in(x, y)

Arguments

x	vector
y	vector

Value

Vector of T/F values with length of x

.i_in	<i>Match values</i>
-------	---------------------

Description

Find matches (return T/F)

Usage

.i_in(x, table)

Arguments

x	vector or NULL: the values to be matched. Long vectors are supported.
table	vector or NULL: the values to be matched against. Long vectors are not supported.

Value

Vector of T/F values with length of x

<code>.merge_labels</code>	<i>combine old value labels with new value labels</i>
----------------------------	---

Description

combine old value labels with new value labels

Usage

```
.merge_labels(old_labs, new_labs)
```

Arguments

<code>old_labs</code>	named vector
<code>new_labs</code>	named vector

Value

Returns names vector of value labels

<code>.valid_annotation</code>	<i>validate annotation - intern</i>
--------------------------------	-------------------------------------

Description

contains run-time-tests annotation runs internally

Usage

```
.valid_annotation(x)
```

Arguments

<code>x</code>	character vector or NULL
----------------	--------------------------

Value

T/F

.valid_label *validate variable label - intern*

Description

run-time-tests for variable label runs internally

Usage

.valid_label(x)

Arguments

x vector

Value

T/F

.valid_labels *validate value labels - intern*

Description

contains several run-time-tests for value labels runs internally

Usage

.valid_labels(x)

Arguments

x named vector (label = value)

Value

No return value. Aborts process when run-time-tests fail.

.valid_missing *validate missing values/range - intern*

Description

validate missing values/range - intern

Usage

`.valid_missing(x)`

Arguments

x vector

Value

T/F

.valid_scale *validate scale label - intern*

Description

run-time-tests for scale level runs internally

Usage

`.valid_scale(x)`

Arguments

x vector

Value

T/F

.valid_subject *validate subject - intern*

Description

contains run-time-tests subject runs internally

Usage

.valid_subject(x)

Arguments

x character vector or NULL

Value

T/F

.valid_wording *validate wording - intern*

Description

contains run-time-tests wording runs internally

Usage

.valid_wording(x)

Arguments

x character vector or NULL

Value

T/F

as.i_labelled	<i>coerce to i_labelled class</i>
---------------	-----------------------------------

Description

coerce to i_labelled class

Usage

```
as.i_labelled(x, ...)
```

Arguments

x	vector
...	attributes passed to class

Value

vector of class i_labelled

grapesingrapes	<i>generic for %in%</i>
----------------	-------------------------

Description

generic for %in%

Usage

```
x %in% table
```

Arguments

x	vector or NULL: the values to be matched. Long vectors are supported.
table	vector or NULL: the values to be matched against. Long vectors are not supported.

Value

T/F

is.i_labelled	<i>check for class i_labelled</i>
---------------	-----------------------------------

Description

check for class i_labelled

Usage

is.i_labelled(x)

Arguments

x vector of class i_labelled

Value

T/F

is_decimal	<i>Check if vector contains decimal values</i>
------------	--

Description

Check if vector contains decimal values

Usage

is_decimal(x)

Arguments

x numeric vector

Value

T/F

<code>i_annotation</code>	<i>add annotation to variable</i>
---------------------------	-----------------------------------

Description

add annotation to `i_labelled` object
 can be used to store additional information about a variable

Usage

```
i_annotation(x, annotation, overwrite = FALSE)
```

Arguments

<code>x</code>	vector
<code>annotation</code>	variable label as string or NULL (NULL will remove label)
<code>overwrite</code>	overwrite existing annotation and replace with new annotation

Value

`x` with annotation applied

<code>i_assert_labels</code>	<i>Check for required value labels in set of variables</i>
------------------------------	--

Description

Check for required value labels in set of variables

Usage

```
i_assert_labels(x, labels, info = NULL, verbose = TRUE)
```

Arguments

<code>x</code>	data.frame
<code>labels</code>	character vector
<code>info</code>	string with info message (purpose of assertion) - optional
<code>verbose</code>	return TRUE when assertion is successful

Value

No return value (except when `verbose = T`). Aborts process when test not valid.

i_as_character	<i>as character</i>
----------------	---------------------

Description

make character from i_labelled

Usage

```
i_as_character(  
  x,  
  missing_to_na = FALSE,  
  require_all_labels = FALSE,  
  keep_attributes = FALSE  
)
```

Arguments

x	vector
missing_to_na	as missing declared values will become NA
require_all_labels	process will be interrupted, when not all values have valid labels
keep_attributes	should attributes be preserved

Value

character vector

i_as_factor	<i>as factor</i>
-------------	------------------

Description

make factor from i_labelled

Usage

```
i_as_factor(  
  x,  
  missing_to_na = FALSE,  
  require_all_labels = FALSE,  
  keep_attributes = FALSE  
)
```

Arguments

x vector

missing_to_na as missing declared values will become NA

require_all_labels
 process will be interrupted, when not all values have valid labels

keep_attributes
 should attributes be preserved

Value

vector of class factor

<i>i_as_numeric</i>	<i>as numeric</i>
---------------------	-------------------

Description

make numeric from *i_labelled*

Usage

```
i_as_numeric(x, missing_to_na = FALSE, keep_attributes = FALSE)
```

Arguments

x vector

missing_to_na as missing declared values will become NA

keep_attributes
 should attributes be preserved

Value

numeric vector

i_copy	<i>copy meta information from one variable to another</i>
--------	---

Description

copy meta information from one variable to another

Usage

```
i_copy(to, from, what = "all", ...)
```

Arguments

to	vector
from	vector
what	character vector describing which labels are copied: 'all' (default), 'label', 'labels', 'na_values', 'na_range'
...	further attributes passed to structure

Value

Returns 'to' with ilabelled attributes copied from 'from'

i_get_annotation	<i>get annotation</i>
------------------	-----------------------

Description

return annotation as character vector applied to vector return list when applied to data.frame

Usage

```
i_get_annotation(x)
```

Arguments

x	vector or data.frame
---	----------------------

Value

returns annotation

`i_get_equal_subject` *get variable names by subject*

Description

return all variable names by subjects
one, several, or all subjects can be looked up

Usage

```
i_get_equal_subject(x, subject = NULL)
```

Arguments

<code>x</code>	<code>data.frame</code>
<code>subject</code>	one or more subjects as character vector. when NULL return all variable names by all subjects in data

Value

named list or NA. return named list with one list entry for each subject. when no subject in data or no match for subjects, return NA.

`i_get_equal_wording` *get variable names by wording*

Description

return all variable names by wordings
one, several, or all wordings can be looked up

Usage

```
i_get_equal_wording(x, wording = NULL)
```

Arguments

<code>x</code>	<code>data.frame</code>
<code>wording</code>	one or more wordings as character vector. when NULL return all variable names by all wordings in data

Value

named list or NA. return named list with one list entry for each wording. when no wording in data or no match for wordings, return NA.

<code>i_get_label</code>	<i>get variable label</i>
--------------------------	---------------------------

Description

return variable label when applied to vector return list when applied to data.frame

Usage

```
i_get_label(x)
```

Arguments

x vector or data.frame

Value

variable label

<code>i_get_labels</code>	<i>get value labels</i>
---------------------------	-------------------------

Description

return labels when applied to vector return list when applied to data.frame

Usage

```
i_get_labels(x)
```

Arguments

x vector or data.frame

Value

values and value labels as data.frame

<code>i_get_na_range</code>	<i>get missing range</i>
-----------------------------	--------------------------

Description

return missing range when applied to vector return list when applied to data.frame

Usage

```
i_get_na_range(x)
```

Arguments

x vector or data.frame

Value

return missing range

<code>i_get_na_values</code>	<i>get missing values</i>
------------------------------	---------------------------

Description

return missing values when applied to vector return list when applied to data.frame

Usage

```
i_get_na_values(x)
```

Arguments

x vector or data.frame

Value

return missing values

<code>i_get_scale</code>	<i>get scale level</i>
--------------------------	------------------------

Description

return scale level when applied to vector return list when applied to data.frame

Usage

```
i_get_scale(x)
```

Arguments

x vector or data.frame

Value

returns scale level

<code>i_get_subject</code>	<i>get subject</i>
----------------------------	--------------------

Description

return subject as character vector applied to vector return list when applied to data.frame

Usage

```
i_get_subject(x)
```

Arguments

x vector or data.frame

Value

returns subject

<code>i_get_wording</code>	<i>get wording</i>
----------------------------	--------------------

Description

return wording as character vector applied to vector return list when applied to data.frame

Usage

```
i_get_wording(x)
```

Arguments

x vector or data.frame

Value

returns wording

<code>i_label</code>	<i>set variable label</i>
----------------------	---------------------------

Description

set variable label

Usage

```
i_label(x, label)
```

Arguments

x vector
label variable label as string or NULL (NULL will remove label)

Value

x with variable label applied

i_labelled	<i>class constructor</i>
------------	--------------------------

Description

class constructor

Usage

```
i_labelled(  
  x,  
  label = NULL,  
  labels = NULL,  
  na_values = NULL,  
  na_range = NULL,  
  scale = NULL,  
  annotation = NULL,  
  wording = NULL,  
  subject = NULL,  
  ...  
)
```

Arguments

x	vector or data.frame
label	variable label
labels	value labels as named vector (e.g. c("A"=1, "B"=2) or setNames(c(1,2), c("A","B")))
na_values	missing values (e.g. c(888, 999))
na_range	range of missing values as vector length 2 (e.g. c(-9,-1))
scale	scale level (nominal, ordinal, scale)
annotation	additional information about variable
wording	question text
subject	subject
...	further attributes passed to class

Value

vector or data.frame

<code>i_labels</code>	<i>set value labels</i>
-----------------------	-------------------------

Description

set value labels

Usage

```
i_labels(x, ..., overwrite = FALSE)
```

Arguments

<code>x</code>	vector
<code>...</code>	set labels for values (e.g. <code>label_of_choice = 1</code> or <code>"Label of Choice" = 1</code>); remove single label with <code>NULL = value</code> (e.g. <code>NULL = 1</code>); removes all value labels when only <code>NULL</code> (e.g. <code>i_label(x, NULL)</code>)
<code>overwrite</code>	should new labels be merged with existing labels or remove existing labels

Details

In order to assign a specific label to multiple values a named list can also be provided to ... (e.g. `list(missing = -9:-1, valid = 1:3)`)

A named vector can also be provided (e.g. `setNames(c(1,2), c("A","B"))`)

Value

returns `x` with value labels applied

<code>i_missing_to_na</code>	<i>missing values to NA</i>
------------------------------	-----------------------------

Description

all values declared as missing will be recoded as NA

Usage

```
i_missing_to_na(x, remove_missing_labels = FALSE)
```

Arguments

<code>x</code>	vector or data.frame
<code>remove_missing_labels</code>	remove values labels from values which are declared as missing

Value

Returns x with missing values coerced to NA

i_na_range *define missing range*

Description

define which values will be handled as missing values

Usage

`i_na_range(x, values)`

Arguments

<code>x</code>	vector
<code>values</code>	vector with missing range e.g. <code>c(-9:-1)</code> or NULL (NULL will remove all missing values)

Value

Returns x with missing range set

i_na_values *define missing values*

Description

define which values will be handled as missing values

Usage

`i_na_values(x, values, sort = TRUE, desc = FALSE)`

Arguments

<code>x</code>	vector
<code>values</code>	vector with missing values e.g. <code>c(888,999)</code> or NULL (NULL will remove all missing values)
<code>sort</code>	sort values
<code>desc</code>	sort values in descending order

Value

Returns x with missing values set

`i_print_annotation` *print annotation*

Description

print annotation

Usage

`i_print_annotation(x)`

Arguments

`x` vector

Value

No return value. Print annotation attribute to console

`i_print_attributes` *print attributes*

Description

print attributes

Usage

`i_print_attributes(x, exclude = NULL)`

Arguments

`x` vector

`exclude` character vector with attribute names not taken into account

Value

No return value. Print attributes to console

`i_print_label` *print variable label*

Description

print variable label

Usage

`i_print_label(x)`

Arguments

x vector

Value

No return value. Print variable label to console

`i_print_labels` *print value labels*

Description

print value labels

Usage

`i_print_labels(x)`

Arguments

x vector

Value

No return value. Print labels to console

`i_print_na_range` *print missing range*

Description

print missing range

Usage

```
i_print_na_range(x)
```

Arguments

x vector

Value

No return value. Print na range to console

`i_print_na_values` *print missing values*

Description

print missing values

Usage

```
i_print_na_values(x)
```

Arguments

x vector

Value

No return value. Print na values to console

i_print_scale *print scale level*

Description

print scale level

Usage

`i_print_scale(x)`

Arguments

x vector

Value

No return value. Print scale level to console

i_print_subject *print subject*

Description

print subject

Usage

`i_print_subject(x)`

Arguments

x vector

Value

No return value. Print subject attribute to console

i_print_wording	<i>print wording</i>
-----------------	----------------------

Description

print wording

Usage

```
i_print_wording(x)
```

Arguments

x	vector
---	--------

Value

No return value. Print wording attribute to console

i_recode	<i>i_recode Function for recoding new variable from origin variable(s).</i>
----------	---

Description

Returns a vector object of class i_labelled

Usage

```
i_recode(  
  x,  
  ...,  
  label = NULL,  
  na_values = NULL,  
  na_range = NULL,  
  scale = NULL,  
  annotation = NULL,  
  wording = NULL,  
  subject = NULL,  
  copy = NULL,  
  keep_labels = FALSE  
)
```

Arguments

x	vector or data.frame
...	formula for recoding of values. See examples.
label	variable label
na_values	a vector with missing values
na_range	a vector for missing range
scale	scale level (nominal, ordinal, metric)
annotation	addition information about variable
wording	question text
subject	subject
copy	When applied to vector: T/F. When applied to a data.frame: a variable from x. Copy the values of an existing variable or x before recoding values according to ...
keep_labels	keep value labels from origin vector when copy TRUE or variable from x

Details

Can be applied to either vector or data.frame. When x is data.frame the formula passed to ... is different from when it is applied to single vector. When function is applied to a data.frame, multiple conditions on multiple variables are possible (e.g when variable X is equal to this, do that; when variable Y is not equal to this, do that, etc.). See examples for further clarification.

You can recode directly via value labels by using

Value

Returns i_labelled vector with values defined by formula and information given to function.

Examples

```
# When applied to a single vector:
# keep in mind that when function is applied to vector, instead of a column use x
myVector <- i_labelled(1:4, labels = c("A" = 1, "B" = 2, "C" = 3, "D" = 4))
i_recode(x = myVector, "AB" = 1 ~ x %in% c("A", "B"), "CD" = 2 ~ x == c(3, 4))

# When applied to data.frame (multiple conditions)
myData <- data.frame(
  V1 = i_labelled(1:3, labels = c("A" = 1, "B" = 2, "C" = 3)),
  V2 = i_labelled(c(2:3,-9))
)
i_recode(x = myData, A = 1 ~ V1 %in% c("A", "B"), 2 ~ "V2" == 3, "C" = 999 ~ V2 == -9)
```

`i_remove_annotation` *remove annotation*

Description

remove annotation label from variable keep other attributes

Usage

```
i_remove_annotation(x)
```

Arguments

x vector or data.frame

Value

Returns x without annotation

`i_remove_label` *remove variable label*

Description

remove variable label keep other attributes

Usage

```
i_remove_label(x)
```

Arguments

x vector or data.frame

Value

Returns x without variable label

i_remove_labels *remove all value labels*

Description

remove all value labels keep other attributes

Usage

`i_remove_labels(x)`

Arguments

x vector or data.frame

Value

Returns x without value labels

i_remove_missing_labels
remove missing labels

Description

remove values labels from values which are declared as missing

Usage

`i_remove_missing_labels(x)`

Arguments

x vector or data.frame

Value

Returns x without missing labels

`i_remove_na_range` *remove as na range*

Description

remove na range (information which values should be handled as missing) keep other attributes

Usage

```
i_remove_na_range(x)
```

Arguments

x vector or data.frame

Value

Returns x without na-range

`i_remove_na_values` *remove as na values*

Description

remove na values (information which values should be handled as missing) keep other attributes

Usage

```
i_remove_na_values(x)
```

Arguments

x vector or data.frame

Value

Returns x without na-values

i_remove_scale *remove scale level*

Description

remove scale label from variable keep other attributes

Usage

`i_remove_scale(x)`

Arguments

`x` vector or data.frame

Value

Returns x without scale level

i_remove_subject *remove subject*

Description

remove subject label from variable keep other attributes

Usage

`i_remove_subject(x)`

Arguments

`x` vector or data.frame

Value

Returns x without subject

<code>i_remove_wording</code>	<i>remove wording</i>
-------------------------------	-----------------------

Description

remove wording label from variable keep other attributes

Usage

```
i_remove_wording(x)
```

Arguments

<code>x</code>	vector or data.frame
----------------	----------------------

Value

Returns x without wording

<code>i_scale</code>	<i>set scale level</i>
----------------------	------------------------

Description

set scale level

Usage

```
i_scale(x, scale = NULL)
```

Arguments

<code>x</code>	vector
<code>scale</code>	scale level (nominal, ordinal, scale) as string or NULL (NULL will remove scale level)

Value

Returns x with scale label set

i_sort_labels *sort value labels by values or by labels*

Description

sort value labels by values or by labels

Usage

```
i_sort_labels(x, by = "values", decreasing = FALSE)
```

Arguments

x vector or data.frame
by either values or labels
decreasing sort decreasing

Value

Returns x with sorted value labels

i_subject *add subject to variable*

Description

add subject to i_labelled object

Usage

```
i_subject(x, subject)
```

Arguments

x vector
subject variable label as string or NULL (NULL will remove label)

Value

x with subject applied

i_table	<i>cross tabulation and table creation using i_labelled labels</i>
---------	--

Description

wrapper for base::table
 convert i_labelled objects to base class and pass to table function

Usage

```
i_table(..., missing_to_na = TRUE, as_factor = TRUE, table_args = NULL)
```

Arguments

...	one or more atomic vectors or one data.frame
missing_to_na	make as missing declared values NA
as_factor	make labelled data factor before pass to table
table_args	arguments of base::table as named list

Value

returns a contingency table, an object of class "table"

Examples

```
set.seed(1234)
a <- sample(c(1:3, NA), 10, replace = TRUE)
b <- i_labelled(sample(c(1:3, NA), 10, replace = TRUE), labels = c("A" = 1, "B" = 2, "C" = 3))
c <- factor(sample(c("X", "Y", "Z", NA), 10, replace = TRUE))
df <- data.frame(a, b, c)

i_table(a, b)
i_table(df, table_args = list(useNA = "ifany"))
```

i_to_base_class	<i>remove class i_labelled and return base R class</i>
-----------------	--

Description

- when value labels for all values are available will return factor
- when value labels are missing will unclass i_labelled
- remove class i_labelled and return variable as base R class

Usage

```
i_to_base_class(  
  x,  
  missing_to_na = TRUE,  
  as_factor = TRUE,  
  keep_attributes = FALSE  
)
```

Arguments

<code>x</code>	vector or data.frame
<code>missing_to_na</code>	missing values will become regular NA
<code>as_factor</code>	convert to factor when value labels are available
<code>keep_attributes</code>	should attributes be preserved

Value

Returns `x` coerced to R base class

<code>i_unclass</code>	<i>unclass variables</i>
------------------------	--------------------------

Description

unclass variables

Usage

```
i_unclass(x, keep_attributes = FALSE)
```

Arguments

<code>x</code>	vector or data.frame
<code>keep_attributes</code>	should attributes be preserved

Value

`x` unclassified

<code>i_valid_annotation</code>	<i>validate annotation</i>
---------------------------------	----------------------------

Description

returns boolean when applied to vector

returns a named list when applied to data.frame

Usage

```
i_valid_annotation(x)
```

Arguments

x vector or data.frame

Value

T/F

<code>i_valid_label</code>	<i>validate variable labels</i>
----------------------------	---------------------------------

Description

returns boolean when applied to vector

returns a named list when applied to data.frame

Usage

```
i_valid_label(x)
```

Arguments

x vector or data.frame

Value

T/F

i_valid_labels *validate value labels*

Description

returns boolean when applied to vector
returns a named list when applied to data.frame

Usage

`i_valid_labels(x)`

Arguments

`x` vector or data.frame

Value

No return value. Aborts process when run-time-tests fail

i_valid_scale *validate variable scale level*

Description

returns boolean when applied to vector
returns a named list when applied to data.frame

Usage

`i_valid_scale(x)`

Arguments

`x` vector or data.frame

Value

T/F

<code>i_valid_subject</code>	<i>validate subject</i>
------------------------------	-------------------------

Description

returns boolean when applied to vector

returns a named list when applied to data.frame

Usage

```
i_valid_subject(x)
```

Arguments

x vector or data.frame

Value

T/F

<code>i_valid_wording</code>	<i>validate wording</i>
------------------------------	-------------------------

Description

returns boolean when applied to vector

returns a named list when applied to data.frame

Usage

```
i_valid_wording(x)
```

Arguments

x vector or data.frame

Value

T/F

<code>i_wording</code>	<i>add wording to variable</i>
------------------------	--------------------------------

Description

add wording to `i_labelled` object
can be used to store question text

Usage

```
i_wording(x, wording)
```

Arguments

<code>x</code>	vector
<code>wording</code>	variable label as string or NULL (NULL will remove label)

Value

`x` with wording applied

<code>print.i_labelled</code>	<i>custom print method for i_labelled</i>
-------------------------------	---

Description

custom print method for `i_labelled`

Usage

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

Arguments

<code>x</code>	vector of class <code>i_labelled</code>
<code>...</code>	not used

Value

No return value. Print object data and information to console

[.i_labelled *subsetting vectors of class i_labelled*

Description

subsetting vectors of class i_labelled

Usage

```
## S3 method for class 'i_labelled'
x[...]
```

Arguments

x vector of class i_labelled
 ... not used

Value

Subset of x

[[.i_labelled *subsetting vectors of class i_labelled*

Description

subsetting vectors of class i_labelled

Usage

```
## S3 method for class 'i_labelled'
x[[...]]
```

Arguments

x vector of class i_labelled
 ... not used

Value

Subset of x

Index

`.i_find_in`, 5
`.i_in`, 5
`.init`, 3
`.is_sequential`, 4
`.merge_labels`, 6
`.valid_annotation`, 6
`.valid_label`, 7
`.valid_labels`, 7
`.valid_missing`, 8
`.valid_scale`, 8
`.valid_subject`, 9
`.valid_wording`, 9
`[.i_labelled`, 42
`[[.i_labelled`, 42
`%in%` (grapesingrapes), 10
`%in%`, ANY, `i_labelled`-method
 (grapesingrapes), 10
`%in%`, `i_labelled`, ANY-method
 (grapesingrapes), 10
`%in%`, `i_labelled`, `i_labelled`-method
 (grapesingrapes), 10

`as.i_labelled`, 10

grapesingrapes, 10

`i_annotation`, 12
`i_as_character`, 13
`i_as_factor`, 13
`i_as_numeric`, 14
`i_assert_labels`, 12
`i_copy`, 15
`i_get_annotation`, 15
`i_get_equal_subject`, 16
`i_get_equal_wording`, 16
`i_get_label`, 17
`i_get_labels`, 17
`i_get_na_range`, 18
`i_get_na_values`, 18
`i_get_scale`, 19

`i_get_subject`, 19
`i_get_wording`, 20
`i_label`, 20
`i_labelled`, 21
`i_labels`, 22
`i_missing_to_na`, 22
`i_na_range`, 23
`i_na_values`, 23
`i_print_annotation`, 24
`i_print_attributes`, 24
`i_print_label`, 25
`i_print_labels`, 25
`i_print_na_range`, 26
`i_print_na_values`, 26
`i_print_scale`, 27
`i_print_subject`, 27
`i_print_wording`, 28
`i_recode`, 28
`i_remove_annotation`, 30
`i_remove_label`, 30
`i_remove_labels`, 31
`i_remove_missing_labels`, 31
`i_remove_na_range`, 32
`i_remove_na_values`, 32
`i_remove_scale`, 33
`i_remove_subject`, 33
`i_remove_wording`, 34
`i_scale`, 34
`i_sort_labels`, 35
`i_subject`, 35
`i_table`, 36
`i_to_base_class`, 36
`i_unclass`, 37
`i_valid_annotation`, 38
`i_valid_label`, 38
`i_valid_labels`, 39
`i_valid_scale`, 39
`i_valid_subject`, 40
`i_valid_wording`, 40

`i_wording`, 41

`is.i_labelled`, 11

`is_decimal`, 11

`print.i_labelled`, 41