Package 'calidad'

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Type Package

Title Assesses the Quality of Estimates Made by Complex Sample Designs

Version 0.8.2

Description Assesses the quality of estimates made by complex sample designs, following the methodology developed by the National Institute of Statistics Chile (Household Survey Standard 2020, <https://www.ine.cl/docs/default-source/institucionalidad/buenas-pr%C3%A1cticas/clasificaciones-y-estandares/est%C3%A1ndar-evaluaci%C3%B3n-de-calidad-de-estimaciones-publicaci%C3%B3n-27022020.pdf>), (Economics Survey Standard 2024, <https://www.ine.gob.cl/docs/default-source/buenas-practicas/directrices-metodologicas/estandares/documentos/est%C3%A1ndar-evaluaci%C3%B3n-de-calidad-de-estimaciones-econ%C3%B3micas.pdf?sfvrsn=201fbeb9_2>) and by Economic Commission for Latin America and Caribbean (2020, <https://repositorio.cepal.org/bitstream/handle/11362/45681/1/S2000293_es.pdf>), (2024, <https://repositorio.cepal.org/server/api/core/bitstreams/f04569e6-4f38-42e7-a32b-e0b298e0ab9c/content>).

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Encoding UTF-8

LazyData true

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`assess` *Assess the quality of mean estimations*

Description

`assess` evaluates the quality of mean estimations using the methodology created by INE Chile, which considers sample size, degrees of freedom, and coefficient of variation.

Usage

```
assess(
  table,
  publish = FALSE,
  scheme = c("chile", "eclac_2020", "eclac_2023", "chile_economics"),
  domain_info = FALSE,
  low_df_justified = FALSE,
  table_n_obj = NULL,
  ratio_between_0_1 = TRUE,
  ...
)
```

Arguments

table	dataframe created by crear_insumos_media.
publish	boolean indicating if the evaluation of the complete table must be added. If TRUE, the function adds a new column to the dataframe.
scheme	character variable indicating the evaluation protocol to use. Options are "chile", "eclac_2020", "eclac_2023", "chile_economics".
domain_info	Logical. If TRUE, indicates that the study domain information is available and will be used for assessment. This affects how the evaluation is conducted, leveraging specific domain-level data to refine the assessment results. When FALSE, domain-specific adjustments are omitted, and a generalized assessment is performed.
low_df_justified	Logical. If TRUE the low degrees of freedom are justified and will be used for assessment. By default FALSE.
table_n_obj	Default NULL. Dataframe with the target sample size column n_obj and columns with the domains to evaluate. Its important check the domain columns type with table.
ratio_between_0_1	boolean. If TRUE, indicates that the estimator is a ratio between 0 and 1.
...	additional parameters for the evaluation. The complete list of parameters is: 1. General Parameters • df degrees of freedom. Default: 9. • n sample size. Default for chile scheme: 60. Default for CEPAL schemes: 100. Default for chile economic standard scheme: 30. 2. chile Parameters • cv_lower_ine lower limit for CV. Default: 0.15. • cv_upper_ine upper limit for CV. Default: 0.3. 3. CEPAL 2020 Parameters • cv_cepal limit for CV. Default: 0.2. • ess effective sample size. Default: 140. • unweighted unweighted count. Default: 50. • log_cv logarithmic coefficient of variation. Default: 0.175. 4. CEPAL 2023 Parameters • cv_lower_cepal lower limit for CV. Default: 0.2. • cv_upper_cepal upper limit for CV. Default: 0.3. • ess effective sample size. Default: 60. • cvlog_max maximum logarithmic coefficient of variation. Default: 0.175. • CCNP_b unweighted count before adjustment. Default: 50. • CCNP_a unweighted count after adjustment. Default: 30. 5. Chile Economic Survey Standard Parameters • cv_lower_econ lower limit for CV. Default: 0.2. • cv_upper_econ upper limit for CV. Default: 0.3.

Value

`dataframe` with all the columns included in the input table, plus a new column containing a label indicating the evaluation of each estimation: reliable, bit reliable, or unreliable.

Examples

```
dc <- survey::svydesign(ids = ~varunit, strata = ~varstrat, data = epf_personas, weights = ~fe)
assess(create_mean("gastot_hd", domains = "zona+sexo", design = dc))
```

---

casen

Encuesta de Caracterización Socioeconómica Nacional 2020 - CASEN en Pandemia 2020

Description

CASEN data for the year 2020. Contains only a few variables.

Usage

```
casen
```

Format

dataframe with 185.437 rows y 6 columns

folio household id

sexo 1 = man; 2 = woman

edad age

activ Economic activity status

ing_aut_hog Household Income

pobreza poverty status: 1 = extreme poverty, 2 = non-extreme poverty, 3 = non-poverty

expr regional sample weights

estrato strata

cod_upm PSU

Source

http://observatorio.ministeriodesarrollosocial.gob.cl/encuesta-casen-en-pandemia-2020

Examples

```
data(casen)
```

create_html *Create html table with the results of the evaluation*

Description

Create html table with the results of the evaluation

Usage

```
create_html(table)
```

Arguments

table	dataframe generated by evaluate function

Value

html table

Examples

```
library(survey)
library(dplyr)

hogar <- epf_personas %>%
  group_by(folio) %>%
  slice(1)
dc <- survey::svydesign(ids = ~varunit, strata = ~varstrat, data = hogar, weights = ~fe)
table <- assess(create_prop("ocupado", domains = "zona+sexo", design = dc))
```

create_mean *Create the inputs to evaluate the quality of mean estimations*

Description

create_mean generates a dataframe with the following elements: mean, degrees of freedom, sample size, and coefficient of variation. The function allows grouping in several domains.

Usage

```
create_mean(
  var,
  domains = NULL,
  subpop = NULL,
  design,
  ci = FALSE,
```

```
  ess = FALSE,
  ajuste_ene = FALSE,
  standard_eval = FALSE,
  rm.na = FALSE,
  deff = FALSE,
  rel_error = FALSE,
  unweighted = FALSE,
  eclac_input = FALSE
)
```

Arguments

var	numeric variable within the dataframe.
domains	domains to be estimated separated by the + character.
subpop	integer dummy variable to filter the dataframe.
design	complex design created by survey package.
ci	boolean indicating if the confidence intervals must be calculated.
ess	boolean effective sample size.
ajuste_ene	boolean indicating if an adjustment for the sampling-frame transition period must be used.
standard_eval	boolean indicating if the function is wrapped inside another function, if TRUE avoid lazy eval errors.
rm.na	boolean remove NA values if required.
deff	boolean design effect.
rel_error	boolean relative error.
unweighted	boolean add non-weighted count if required.
eclac_input	boolean return eclac inputs.

Value

dataframe that contains the inputs and all domains to be evaluated.

Examples

```
dc <- survey::svydesign(ids = ~varunit, strata = ~varstrat, data = epf_personas, weights = ~fe)
create_mean("gastot_hd", "zona+sexo", design = dc)
```

create_prop *Create the inputs to evaluate the quality of proportion estimations*

Description

create_prop generates a dataframe with the following elements: sum, degrees of freedom, sample size, standard error, and coefficient of variation. The function allows grouping in several domains.

Usage

```
create_prop(
  var,
  denominator = NULL,
  domains = NULL,
  subpop = NULL,
  design,
  ci = FALSE,
  deff = FALSE,
  ess = FALSE,
  ajuste_ene = FALSE,
  rel_error = FALSE,
  log_cv = FALSE,
  unweighted = FALSE,
  standard_eval = FALSE,
  eclac_input = FALSE,
  ci_logit = FALSE,
  scheme = c("eclac_2020", "eclac_2023")
)
```

Arguments

var	numeric variable within the dataframe, is the numerator of the ratio to be calculated.
denominator	numeric variable within the dataframe, is the denominator of the ratio to be calculated. If the var parameter is dummy, it can be NULL.
domains	domains to be estimated separated by the + character.
subpop	integer dummy variable to filter the dataframe.
design	complex design created by survey package.
ci	boolean indicating if the confidence intervals must be calculated.
deff	boolean design effect.
ess	boolean effective sample size.
ajuste_ene	boolean indicating if an adjustment for the sampling-frame transition period must be used.
rel_error	boolean relative error.

log_cv	boolean logarithmic coefficient of variation.
unweighted	boolean add non-weighted count if required.
standard_eval	boolean indicating if the function is wrapped inside another function, if TRUE avoid lazy eval errors.
eclac_input	boolean return eclac inputs
ci_logit	boolean indicating if interval confidence is logit, only available for proportions.
scheme	character variable indicating the evaluation protocol to use for CEPAL standard. Options are "eclac_2020" and "eclac_2023". The "eclac_2020" option does not support ratio estimation.

Value

dataframe that contains the inputs and all domains to be evaluated.

Examples

```
library(survey)
library(dplyr)

epf <- mutate(epf_personas, gasto_zona1 = if_else(zona == 1, gastot_hd, 0))
dc <- svydesign(ids = ~varunit, strata = ~varstrat, data = epf, weights = ~fe)
old_options <- options()
options(survey.lonely.psu = "certainty")

create_prop(var = "gasto_zona1", denominator = "gastot_hd", design = dc)

enusc <- filter(enusc, Kish == 1)

dc <- svydesign(ids = ~Conglomerado, strata = ~VarStrat, data = enusc, weights = ~Fact_Pers)
options(survey.lonely.psu = "certainty")
create_prop(var = "VP_DC", denominator = "hom_insg_taxi", design = dc)
options(old_options)
```

---

create_prop_internal *internal function to calculate proportion estimations*

Description

internal function to calculate proportion estimations

Usage

```
create_prop_internal(
  var,
  domains = NULL,
  subpop = NULL,
  disenio,
```

```
  ci = FALSE,
  deff = FALSE,
  ess = FALSE,
  ajuste_ene = FALSE,
  rel_error = FALSE,
  log_cv = FALSE,
  unweighted = FALSE,
  standard_eval = TRUE,
  rm.na = FALSE,
  env = parent.frame(),
  ci_logit = FALSE
)
```

Arguments

var	integer dummy variable within the dataframe
domains	domains to be estimated separated by the + character.
subpop	integer dummy variable to filter the dataframe
disenio	complex design created by survey package
ci	boolean indicating if the confidence intervals must be calculated
deff	boolean Design effect
ess	boolean Effective sample size
ajuste_ene	boolean indicating if an adjustment for the sampling-frame transition period must be used
rel_error	boolean Relative error
log_cv	boolean indicating if the log cv must be returned
unweighted	boolean Add non weighted count if it is required
standard_eval	boolean indicating if the function is inside another function, by default it is TRUE, avoid problems with lazy eval.
rm.na	boolean indicating if NA values must be removed
env	parent environment to get some variables
ci_logit	boolean indicating if interval confidence is logit

Value

dataframe that contains the inputs and all domains to be evaluated

`create_ratio_internal` *internal function to calculate ratios estimations*

Description

internal function to calculate ratios estimations

Usage

```
create_ratio_internal(
  var,
  denominator,
  domains = NULL,
  subpop = NULL,
  disenio,
  ci = FALSE,
  deff = FALSE,
  ess = FALSE,
  ajuste_ene = FALSE,
  unweighted = FALSE,
  rel_error = FALSE,
  log_cv = FALSE,
  rm.na = FALSE
)
```

Arguments

`var`	numeric variable within the `dataframe`, is the numerator of the ratio to be calculated.
`denominator`	numeric variable within the `dataframe`, is the denominator of the ratio to be calculated.
`domains`	domains to be estimated separated by the + character.
`subpop`	integer dummy variable to filter the dataframe
`disenio`	complex design created by `survey` package
`ci`	`boolean` indicating if the confidence intervals must be calculated
`deff`	`boolean` Design effect
`ess`	`boolean` Effective sample size
`ajuste_ene`	`boolean` indicating if an adjustment for the sampling-frame transition period must be used
`unweighted`	`boolean` Add non weighted count if it is required
`rel_error`	`boolean` Relative error
`log_cv`	`boolean` indicating if the log cv must be returned. Used for ratios between 0 and 1.
`rm.na`	`boolean` indicating if NA values must be removed

Value

dataframe that contains the inputs and all domains to be evaluated

---

create_size *Create the inputs to evaluate the quality of total estimations*

Description

create_size generates a dataframe with the following elements: sum, degrees of freedom, sample size, and coefficient of variation. The function allows grouping in several domains.

Usage

```
create_size(
  var,
  domains = NULL,
  subpop = NULL,
  design,
  ci = FALSE,
  ess = FALSE,
  ajuste_ene = FALSE,
  standard_eval = FALSE,
  rm.na = FALSE,
  deff = FALSE,
  rel_error = FALSE,
  unweighted = FALSE,
  df_type = c("chile", "eclac"),
  eclac_input = FALSE
)
```

Arguments

var	numeric variable within the dataframe. When the domain parameter is not used, it is possible to include more than one variable using the + separator. When a value is introduced in the domain parameter, the estimation variable must be a dummy variable.
domains	domains to be estimated separated by the + character.
subpop	integer dummy variable to filter the dataframe.
design	complex design created by survey package.
ci	boolean indicating if the confidence intervals must be calculated.
ess	boolean effective sample size.
ajuste_ene	boolean indicating if an adjustment for the sampling-frame transition period must be used.
standard_eval	boolean indicating if the function is wrapped inside another function, if TRUE avoid lazy eval errors.

rm.na	boolean remove NA values if required.
deff	boolean design effect.
rel_error	boolean relative error.
unweighted	boolean add non-weighted count if required.
df_type	character use degrees of freedom calculation approach from INE Chile or CEPAL. Options are "chile" or "eclac".
eclac_input	boolean return eclac inputs

Value

dataframe that contains the inputs and all domains to be evaluated.

Examples

```
dc <- survey::svydesign(ids = ~varunit, strata = ~varstrat, data = epf_personas, weights = ~fe)
create_size("ocupado", "zona+sexo", design = dc)
```

---

create_total *Create the inputs to evaluate the quality of the sum of continuous variables*

Description

create_total generates a dataframe with the following elements: sum, degrees of freedom, sample size, and coefficient of variation. The function allows grouping in several domains.

Usage

```
create_total(
  var,
  domains = NULL,
  subpop = NULL,
  design,
  ci = FALSE,
  ess = FALSE,
  ajuste_ene = FALSE,
  standard_eval = FALSE,
  rm.na = FALSE,
  deff = FALSE,
  rel_error = FALSE,
  unweighted = FALSE,
  eclac_input = FALSE
)
```

Arguments

var	numeric variable within the dataframe.
domains	domains to be estimated separated by the + character.
subpop	integer dummy variable to filter the dataframe.
design	complex design created by survey package.
ci	boolean indicating if the confidence intervals must be calculated.
ess	boolean effective sample size.
ajuste_ene	boolean indicating if an adjustment for the sampling-frame transition period must be used.
standard_eval	boolean indicating if the function is wrapped inside another function, if TRUE avoid lazy eval errors.
rm.na	boolean remove NA values if required.
deff	boolean design effect.
rel_error	boolean relative error.
unweighted	boolean add non-weighted count if required.
eclac_input	boolean return eclac inputs

Value

dataframe that contains the inputs and all domains to be evaluated.

Examples

```
dc <- survey::svydesign(ids = ~varunit, strata = ~varstrat, data = epf_personas, weights = ~fe)
create_total("gastot_hd", "zona+sexo", subpop = "ocupado", design = dc)
```

---

eclac_standard *Turn on all the indicators needed for the eclac standard*

Description

This function activates the appropriate indicators based on the selected eclac standard and whether proportion indicators are needed.

Usage

```
eclac_standard(eclac, env = parent.frame(), proportion = FALSE)
```

Arguments

eclac	A logical value indicating the eclac standard.
env	The environment from which to retrieve the existing indicator values. Defaults to the parent frame.
proportion	A logical value indicating whether proportion indicators should be turned on. Defaults to FALSE.

Value

A list of logical values indicating which indicators are turned on.

ELE7 *Encuesta Longitudinal de Empresas*

Description

ELE data for the year 2022. Contains only a few variables.

Usage

```
ELE7
```

Format

dataframe with 6.592 rows y 13 columns

rol_ficticio Company ID

cod_actividad Economic activity

cod_tamano Company size by sales

tramo Inclusion range

fe_transversal Cross-sectional weights

fe_longitudinal Longitudinal weights

panel Panel sample

estrato Strata

pob Finite population correction

VA_2022 Value added 2022, difference between production value and intermediate consumption

VA_2022f VA_2022f is an adjusted version of VA_2022, where negative values are replaced with 0, while non-negative values remain unchanged.

EMP Total personnel employed and hired by the company on a monthly basis

REMP_TOTAL Total gross remuneration of personnel hired by the company

Source

https://www.ine.gob.cl/docs/default-source/encuesta-longitudinal-de-empresas/bbdd/ele-2022/base-de-datos-ele7.csv?sfvrsn=1504c58d_4&download=true

Examples

```
data(ELE7)
```

ELE7_n_obj *Tamano muestra objetivo Encuesta Longitudinal de Empresas*

Description

Target cross-sectional sample size ELE data for the year 2022.

Usage

```
ELE7_n_obj
```

Format

dataframe with 59 rows y 4 columns

cod_tamano Company size by sales

cod_actividad_letra Economic activity

cod_actividad Economic activity ID

n_obj Target sample size

Source

https://www.ine.gob.cl/docs/default-source/encuesta-longitudinal-de-empresas/metodologias/ele-2022/informe-de-calidad-ele7.pdf?sfvrsn=6ca73eb5_4

Examples

```
data(ELE7_n_obj)
```

ene *Encuesta Nacional de Empleo - ENE. 2020-efm*

Description

Reduced version of the ENE database. Contains some sociodemographic variables and the necessary information to work with complex design

Usage

```
ene
```

Format

dataframe with 87.842 rows y 7 columns

sexo 1 = man; 2 = woman

region region

cae_especifico Economic activity status

fe sample weights

varunit PSU

varstrat strata

fdt It shows if the person belongs to labour force: 1 = yes; 0 = no

ocupado 1 = employed; 0 = non-employed

desocupado 1 = non-employed; 0 = employed

Source

https://www.ine.cl/estadisticas/sociales/mercado-laboral/ocupacion-y-desocupacion

Examples

```
data(ene)
```

---

enusc *Encuesta Nacional Urbana de Seguridad Ciudadana 2019 - ENUSC 2019*

Description

ENUSC data for the year 2019. Contains only a few variables.

Usage

```
enusc
```

Format

dataframe with 24.465 rows y 22 columns

rph_sexo 1 = man; 2 = woman

region 16 regions

Fact_Pers person sample weights

Fact_Hog household sample weights

Conglomerado PSU

VarStrat strata

VP_DC Individual victimization. It works combined with Fact_Pers

VA_DC Household victimization. It works combined with Fact_Hog

rph_edad age

P3_1_1 Perception of increased crime in the country. It works combined with Fact_Pers

P8_1_1 Cause of increased crime in the neighborhood. It works combined with Fact_Pers

muj_insg_taxi Female perception of insecurity inside taxis. Variable elaborated with variables P9 and rph_sexo . It works combined with Fact_Pers

hom_insg_taxi Male perception of insecurity inside taxis. Variable elaborated with variables P9 and rph_sexo. It works combined with Fact_Pers

muj_insg_micro Female perception of insecurity inside buses. Variable elaborated with variables P9 and rph_sexo. It works combined with Fact_Pers

hom_insg_micro Male perception of insecurity inside buses. Variable elaborated with variables P9 and rph_sexo. It works combined with Fact_Pers

muj_insg_centr.com Female perception of insecurity inside malls. Variable elaborated with variables P9 and rph_sexo. It works combined with Fact_Pers

hom_insg_centr.com Male perception of insecurity inside malls. Variable elaborated with variables P9 and rph_sexo. It works combined with Fact_Pers

muj_insg_loc.col Female perception of insecurity public transport. Variable elaborated with variables P9 and rph_sexo. It works combined with Fact_Pers

hom_insg_loc.col Male perception of insecurity public transport. Variable elaborated with variables P9 and rph_sexo. It works combined with Fact_Pers

muj_insg_barrio Female perception of insecurity neighborhood. Variable elaborated with variables P9 and rph_sexo. It works combined with Fact_Pers

hom_insg_barrio Male perception of insecurity neighborhood. Variable elaborated with variables P9 and rph_sexo. It works combined with Fact_Pers

Source

https://www.ine.cl/docs/default-source/seguridad-ciudadana/bbdd/2019/base-de-datos---xvi-enusc-201
.csv?sfvrsn=d3465758_2&download=true

Examples

```
data(enusc)
```

enusc_2023 *Encuesta Nacional Urbana de Seguridad Ciudadana 2023 - ENUSC 2023*

Description

ENUSC data for the year 2023. Contains only a few variables.

Usage

```
enusc_2023
```

Format

dataframe with 49.813 rows y 15 columns

enc_region 16 regions

enc_rpc Code of region, province and commune

Fact_Pers_Reg Person sample weights at region level

Fact_Pers_Com Person sample weights at commune level

Fact_Hog_Reg Household sample weights at region level

Fact_Hog_Com Household sample weights at commune level

VarStrat Strata

Conglomerado PSU

VH_DV Households victimized by violent crimes. It works combined with Fact_Hog_*

VH_DC Household victimization. It works combined with Fact_Hog_*

VP_DV People victimized by violent crimes. It works combined with Fact_Pers_*

VP_DC Individual victimization. It works combined with Fact_Pers_*

PAD Perception of increased crime in the country. It works combined with Fact_Pers_*

rph_sexo 1 = man; 2 = woman

rph_edad Age

Source

https://www.ine.gob.cl/docs/default-source/seguridad-ciudadana/bbdd/2023/base-usuario-20-enusc-2023-csv?sfvrsn=34653b72_2&download=true

Examples

```
data(enusc_2023)
```

epf_personas *VIII Encuesta de Presupuestos Familiares*

Description

Reduced version of the VIII EPF database. Contains some sociodemographic variables and the necessary information to work with complex design.

Usage

```
epf_personas
```

Format

dataframe compuesto por 48.308 observaciones y 8 variables

sexo 1 = male; 2 = female

zona 1 = metropolitan area; 2 = rest of the regional capitals

ecivil marital status

fe sample weights

varunit PSU

varstrat strata

gastot_hd household expenditure

ocupado 1 = employed; 0 = non-employed

Source

https://www.ine.cl/estadisticas/sociales/ingresos-y-gastos/encuesta-de-presupuestos-familiares

Examples

```
data(epf_personas)
```

get_cv *Get the coefficient of variation*

Description

Receive a table created with survey and return the coefficient of variation for each cell

Usage

```
get_cv(table, design, domains, type_est = "all", env = parent.frame())
```

Arguments

table	dataframe with results
design	design
domains	vector with domains
type_est	type of estimation: all or size.
env	parent environment

Value

dataframe with results including including CV

get_df *Get degrees of freedom*

Description

Receive data and domains. Returns a data frame with the psu (if available), strata and degrees of freedom (df) for each cell

Usage

```
get_df(data, domains, df_type = "eclac")
```

Arguments

data	dataframe
domains	string with domains
df_type	string Use degrees of freedom calculation approach from INE Chile or eclac, by default "chile".

Value

dataframe with results including degrees of freedom

get_survey_table *Calculates multiple estimations. Internal wrapper for survey package*

Description

Generates a table with estimates for a given aggregation

Usage

```
get_survey_table(
  var,
  domains,
  complex_design,
  estimation = "mean",
  env = parent.frame(),
  fun,
  denom = NULL,
  type_est = "all"
)
```

Arguments

var	string objective variable
domains	domains
complex_design	design from survey
estimation	string indicating if the mean must be calculated
env	parent environment
fun	function required regarding the estimation
denom	denominator. This parameter works for the ratio estimation
type_est	type of estimation: all or size

Value

dataframe containing main results from survey

quadratic *Calcula el valor de una función cuadrática*

Description

quadratic returns the output of a particular function created by INE Chile, which is assessed at the value of the estimated proportion from a sample. If the output of the function is higher than the standard error, it is interpreted as a signal that the estimation is not reliable.

Usage

```
quadratic(p)
```

Arguments

p	numeric vector with the values of the estimations for proportions

Value

numeric vector

standardize_columns *standardize and sort column names*

Description

Receive the survey table in raw state and sort it

Usage

```
standardize_columns(data, var, denom)
```

Arguments

data	dataframe with results
var	string with the objective variable
denom	denominator

Value

dataframe with standardized data

`standardize_design_variables` *Standardize the name of design variables*

Description

Rename design variables, so we can use the later

Usage

```
standardize_design_variables(design)
```

Arguments

`design`	`dataframe`

Value

design survey

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