

Package ‘jstable’

March 5, 2025

Title Create Tables from Different Types of Regression

Version 1.3.9

Date 2025-02-24

Description Create regression tables from generalized linear model(GLM), generalized estimating equation(GEE), generalized linear mixed-effects model(GLMM), Cox proportional hazards model, survey-weighted generalized linear model(svyglm) and survey-weighted Cox model results for publication.

Depends R (>= 3.4.0)

License Apache License 2.0

Encoding UTF-8

RoxygenNote 7.3.2

Imports geepack, lme4, stats, data.table, labelled, tableone, coxme, survival (>= 3.0.0), survey, methods, dplyr, purrr, magrittr, tibble, rlang, car, lmerTest

URL <https://github.com/jinseob2kim/jstable>

BugReports <https://github.com/jinseob2kim/jstable/issues>

Suggests testthat, knitr, rmarkdown

VignetteBuilder knitr

LazyData true

NeedsCompilation no

Author Jinseob Kim [aut, cre] (<<https://orcid.org/0000-0002-9403-605X>>),
Zarathu [cph, fnd],
Yoonkyoung Jeon [aut],
Jaehun Shon [aut],
Hyojong Myung [aut],
Hyungwoo Jo [aut]

Maintainer Jinseob Kim <jinseob2kim@gmail.com>

Repository CRAN

Date/Publication 2025-03-05 10:50:13 UTC

Contents

coefNA	3
count_event_by	3
cox2.display	4
coxExp	5
coxme.display	6
coxmeTable	6
CreateTableOne2	7
CreateTableOneJS	10
extractAIC.coxme	13
geeExp	14
geeglm.display	15
geeUni	16
glmshow.display	17
LabelepiDisplay	17
LabeljsCox	18
LabeljsGeeglm	19
LabeljsMetric	20
LabeljsMixed	20
LabeljsRanef	21
LabeljsTable	22
lmer.display	23
lmerExp	23
mk.lev	24
mk.lev.var	25
mort	25
opt.data	27
opt.roc	27
opt.simplifiedown	28
opt.tb1	29
opt.tbreg	29
svycox.display	30
svyCreateTableOne2	31
svyCreateTableOneJS	33
svyregress.display	36
TableSubgroupCox	36
TableSubgroupGLM	38
TableSubgroupMultiCox	40
TableSubgroupMultiGLM	41

Index

44

coefNA	<i>coefNA: make coefficient table with NA</i>
--------	---

Description

Make coefficient table with NA

Usage

```
coefNA(model)
```

Arguments

model glm object (gaussian or binomial)

Details

DETAILS

Value

coefficient table with NA

Examples

```
coefNA(glm(mpg ~ wt + qsec, data = mtcars))
```

count_event_by	<i>count_event_by: function to count event, subgroup number inside TableSubgroupCox, TableSubgroupMultiCox</i>
----------------	--

Description

Function to count event, subgroup number

Usage

```
count_event_by(
  formula,
  data,
  count_by_var = NULL,
  var_subgroup = NULL,
  decimal.percent = 1
)
```

Arguments

formula	formula with survival analysis
data	same data as in formula
count_by_var	variables to count subgroup for
var_subgroup	1 sub-group variable for analysis,
decimal.percent	decimals to show percent of, Default: 1

Details

This function is used inside TableSubgroupCox, TableSubgroupMultiCox for calculation

Value

Table with event, subgroup number

See Also

[group_by](#), [summarise](#), [mutate](#), [bind_rows](#), [arrange](#)

Examples

```
## Not run:
if (interactive()) {

}

## End(Not run)
```

cox2.display	<i>cox2.display: table for coxph.object with model option: TRUE - allow "frailty" or "cluster" model</i>
--------------	--

Description

Table for coxph.object with model option: TRUE - allow "frailty" or "cluster" model

Usage

```
cox2.display(cox.obj.withmodel, dec = 2, msm = NULL)
```

Arguments

cox.obj.withmodel	coxph.object with model option: TRUE
dec	Decimal point, Default: 2
msm	Multi state model, Default: NULL

Details

GEE like - cluster, Mixed effect model like - frailty

Value

Table, cluster/frailty info, metrics, caption

Examples

```
library(survival)
data(lung)
fit1 <- coxph(Surv(time, status) ~ ph.ecog + age + cluster(inst), data = lung, model = TRUE)
fit2 <- coxph(Surv(time, status) ~ ph.ecog + age + frailty(inst), data = lung, model = TRUE)
cox2.display(fit1)
cox2.display(fit2)
```

coxExp	<i>coxExp: transform the unit of coefficients in cox model(internal function)</i>
--------	---

Description

Transform the unit of coefficients to "HR"

Usage

```
coxExp(cox.coef, dec)
```

Arguments

cox.coef	cox model coefficients
dec	Decimal point

Details

DETAILS

Value

The transformed coefficients(95

Examples

```
library(coxme)
fit <- coxme(Surv(time, status) ~ ph.ecog + age + (1 | inst), lung)
jstable:::coxExp(jstable:::coxmeTable(fit))
```

coxme.display *coxme.display: table for coxme.object (coxme package)*

Description

Make mixed effect model results from coxme.object (coxme package)

Usage

```
coxme.display(coxme.obj, dec = 2)
```

Arguments

coxme.obj	coxme.object
dec	Decimal point, Default: 2

Details

DETAILS

Value

Fixed effect table, random effect, metrics, caption

Examples

```
library(coxme)
fit <- coxme(Surv(time, status) ~ ph.ecog + age + (1 | inst), lung)
coxme.display(fit)
```

coxmeTable *coxmeTable: Summary table of coxme.object(internal function)*

Description

Extract fixed effect table in coxme.object

Usage

```
coxmeTable(mod)
```

Arguments

mod	coxme.object
-----	--------------

Details

DETAILS

Value

beta, se, z, p of fixed effects

Examples

```
library(coxme)
fit <- coxme(Surv(time, status) ~ ph.ecog + age + (1 | inst), lung)
jstable:::coxmeTable(fit)
```

CreateTableOne2	<i>CreateTableOne2: Modified CreateTableOne function in tableone package</i>
-----------------	--

Description

Combine CreateTableOne & print function in tableone package

Usage

```
CreateTableOne2(
  data,
  strata,
  vars,
  factorVars,
  includeNA = F,
  test = T,
  testApprox = chisq.test,
  argsApprox = list(correct = TRUE),
  testExact = fisher.test,
  argsExact = list(workspace = 2 * 10^5),
  testNormal = oneway.test,
  argsNormal = list(var.equal = F),
  testNonNormal = kruskal.test,
  argsNonNormal = list(NULL),
  showAllLevels = T,
  printToggle = F,
  quote = F,
  smd = F,
  Labels = F,
  exact = NULL,
  nonnormal = NULL,
  catDigits = 1,
  contDigits = 2,
```

```

pDigits = 3,
labeldata = NULL,
minMax = F,
showpm = T,
addOverall = F,
pairwise = F,
pairwise.showtest = F
)

```

Arguments

<code>data</code>	A data frame in which these variables exist. All variables (both vars and strata) must be in this data frame.
<code>strata</code>	Stratifying (grouping) variable name(s) given as a character vector. If omitted, the overall results are returned.
<code>vars</code>	Variables to be summarized given as a character vector. Factors are handled as categorical variables, whereas numeric variables are handled as continuous variables. If empty, all variables in the data frame specified in the data argument are used.
<code>factorVars</code>	Numerically coded variables that should be handled as categorical variables given as a character vector. Do not include factors, unless you need to relevel them by removing empty levels. If omitted, only factors are considered categorical variables. The variables specified here must also be specified in the vars argument.
<code>includeNA</code>	If TRUE, NA is handled as a regular factor level rather than missing. NA is shown as the last factor level in the table. Only effective for categorical variables., Default: F
<code>test</code>	If TRUE, as in the default and there are more than two groups, groupwise comparisons are performed, Default: T
<code>testApprox</code>	A function used to perform the large sample approximation based tests. The default is <code>chisq.test</code> . This is not recommended when some of the cell have small counts like fewer than 5, Default: <code>chisq.test</code>
<code>argsApprox</code>	A named list of arguments passed to the function specified in <code>testApprox</code> . The default is <code>list(correct = TRUE)</code> , which turns on the continuity correction for <code>chisq.test</code> , Default: <code>list(correct = TRUE)</code>
<code>testExact</code>	A function used to perform the exact tests. The default is <code>fisher.test</code> . If the cells have large numbers, it will fail because of memory limitation. In this situation, the large sample approximation based should suffice., Default: <code>fisher.test</code>
<code>argsExact</code>	A named list of arguments passed to the function specified in <code>testExact</code> . The default is <code>list(workspace = 2 * 10^5)</code> , which specifies the memory space allocated for <code>fisher.test</code> , Default: <code>list(workspace = 2 * 10^5)</code>
<code>testNormal</code>	A function used to perform the normal assumption based tests. The default is <code>oneway.test</code> . This is equivalent of the t-test when there are only two groups, Default: <code>oneway.test</code>

argsNormal	A named list of arguments passed to the function specified in testNormal. The default is list(var.equal = TRUE), which makes it the ordinary ANOVA that assumes equal variance across groups., Default: list(var.equal = F)
testNonNormal	A function used to perform the nonparametric tests. The default is kruskal.test (Kruskal-Wallis Rank Sum Test). This is equivalent of the wilcox.test (Mann-Whitney U test) when there are only two groups, Default: kruskal.test
argsNonNormal	A named list of arguments passed to the function specified in testNonNormal. The default is list(NULL), which is just a placeholder., Default: list(NULL)
showAllLevels	Whether to show all levels. FALSE by default, i.e., for 2-level categorical variables, only the higher level is shown to avoid redundant information., Default: T
printToggle	Whether to print the output. If FALSE, no output is created, and a matrix is invisibly returned., Default: F
quote	Whether to show everything in quotes. The default is FALSE. If TRUE, everything including the row and column names are quoted so that you can copy it to Excel easily, Default: F
smd	If TRUE, as in the default and there are more than two groups, standardized mean differences for all pairwise comparisons are calculated, Default: F
Labels	Use Label, Default: F
exact	A character vector to specify the variables for which the p-values should be those of exact tests. By default all p-values are from large sample approximation tests (chisq.test)., Default: NULL
nonnormal	A character vector to specify the variables for which the p-values should be those of nonparametric tests. By default all p-values are from normal assumption-based tests (oneway.test)., Default: NULL
catDigits	Number of digits to print for proportions., Default: 1
contDigits	Number of digits to print for continuous variables. Default 2.
pDigits	Number of digits to print for p-values (also used for standardized mean differences), Default: 3
labeldata	labeldata to use, Default: NULL
minMax	Whether to use [min,max] instead of [p25,p75] for nonnormal variables. The default is FALSE.
showpm	Logical, show normal distributed continuous variables as Mean \pm SD. Default: T
addOverall	(optional, only used if strata are supplied) Adds an overall column to the table. Smd and p-value calculations are performed using only the stratified columns. Default: F
pairwise	(optional, only used if strata are supplied) When there are three or more strata, it displays the p-values for pairwise comparisons. Default: F
pairwise.showtest	(optional, only used if strata are supplied) When using pairwise comparison, it displays the test used to calculate p-values for pairwise comparisons. Default: F

Details

DETAILS

Value

A matrix object containing what you see is also invisibly returned. This can be assigned a name and exported via write.csv.

Examples

```
library(survival)
CreateTableOne2(vars = names(lung), strata = "sex", data = lung)
```

CreateTableOneJS	<i>CreateTableOneJS: Modified CreateTableOne function in tableone package</i>
------------------	---

Description

Combine CreateTableOne & print function in tableone package

Usage

```
CreateTableOneJS(  
  vars,  
  strata = NULL,  
  strata2 = NULL,  
  data,  
  factorVars = NULL,  
  includeNA = F,  
  test = T,  
  testApprox = chisq.test,  
  argsApprox = list(correct = TRUE),  
  testExact = fisher.test,  
  argsExact = list(workspace = 2 * 10^5),  
  testNormal = oneway.test,  
  argsNormal = list(var.equal = F),  
  testNonNormal = kruskal.test,  
  argsNonNormal = list(NULL),  
  showAllLevels = T,  
  printToggle = F,  
  quote = F,  
  smd = F,  
  Labels = F,  
  exact = NULL,  
  nonnormal = NULL,  
  catDigits = 1,
```

```

contDigits = 2,
pDigits = 3,
labeldata = NULL,
psub = T,
minMax = F,
showpm = T,
addOverall = F,
normalityTest = F,
pairwise = F,
pairwise.showtest = F
)

```

Arguments

vars	Variables to be summarized given as a character vector. Factors are handled as categorical variables, whereas numeric variables are handled as continuous variables. If empty, all variables in the data frame specified in the data argument are used.
strata	Stratifying grouping variable name(s) given as a character vector. If omitted, the overall results are returned.
strata2	Stratifying 2nd grouping variable name(s) given as a character vector. If omitted, the 1 group results are returned.
data	A data frame in which these variables exist. All variables (both vars and strata) must be in this data frame.
factorVars	Numerically coded variables that should be handled as categorical variables given as a character vector. Do not include factors, unless you need to relevel them by removing empty levels. If omitted, only factors are considered categorical variables. The variables specified here must also be specified in the vars argument.
includeNA	If TRUE, NA is handled as a regular factor level rather than missing. NA is shown as the last factor level in the table. Only effective for categorical variables., Default: F
test	If TRUE, as in the default and there are more than two groups, groupwise comparisons are performed, Default: T
testApprox	A function used to perform the large sample approximation based tests. The default is chisq.test. This is not recommended when some of the cell have small counts like fewer than 5, Default: chisq.test
argsApprox	A named list of arguments passed to the function specified in testApprox. The default is list(correct = TRUE), which turns on the continuity correction for chisq.test, Default: list(correct = TRUE)
testExact	A function used to perform the exact tests. The default is fisher.test. If the cells have large numbers, it will fail because of memory limitation. In this situation, the large sample approximation based should suffice., Default: fisher.test
argsExact	A named list of arguments passed to the function specified in testExact. The default is list(workspace = 2 * 10^5), which specifies the memory space allocated for fisher.test, Default: list(workspace = 2 * 10^5)

testNormal	A function used to perform the normal assumption based tests. The default is oneway.test. This is equivalent of the t-test when there are only two groups, Default: oneway.test
argsNormal	A named list of arguments passed to the function specified in testNormal. The default is list(var.equal = TRUE), which makes it the ordinary ANOVA that assumes equal variance across groups., Default: list(var.equal = F)
testNonNormal	A function used to perform the nonparametric tests. The default is kruskal.test (Kruskal-Wallis Rank Sum Test). This is equivalent of the wilcox.test (Mann-Whitney U test) when there are only two groups, Default: kruskal.test
argsNonNormal	A named list of arguments passed to the function specified in testNonNormal. The default is list(NULL), which is just a placeholder., Default: list(NULL)
showAllLevels	Whether to show all levels. FALSE by default, i.e., for 2-level categorical variables, only the higher level is shown to avoid redundant information., Default: T
printToggle	Whether to print the output. If FALSE, no output is created, and a matrix is invisibly returned., Default: F
quote	Whether to show everything in quotes. The default is FALSE. If TRUE, everything including the row and column names are quoted so that you can copy it to Excel easily, Default: F
smd	If TRUE, as in the default and there are more than two groups, standardized mean differences for all pairwise comparisons are calculated, Default: F
Labels	Use Label, Default: F
exact	A character vector to specify the variables for which the p-values should be those of exact tests. By default all p-values are from large sample approximation tests (chisq.test), Default: NULL
nonnormal	A character vector to specify the variables for which the p-values should be those of nonparametric tests. By default all p-values are from normal assumption-based tests (oneway.test), Default: NULL
catDigits	Number of digits to print for proportions. Default: 1
contDigits	Number of digits to print for continuous variables. Default 2.
pDigits	Number of digits to print for p-values (also used for standardized mean differences), Default: 3
labeldata	labeldata to use, Default: NULL
psub	show sub-group p-values, Default: F
minMax	Whether to use [min,max] instead of [p25,p75] for nonnormal variables. The default is FALSE.
showpm	Logical, show normal distributed continuous variables as Mean \pm SD. Default: T
addOverall	(optional, only used if strata are supplied) Adds an overall column to the table. Smd and p-value calculations are performed using only the stratified columns. Default: F
normalityTest	Logical, perform the Shapiro test for all variables. Default: F

`pairwise` (optional, only used if strata are supplied) When there are three or more strata, it displays the p-values for pairwise comparisons. Default: F# @return A matrix object containing what you see is also invisibly returned. This can be assigned a name and exported via `write.csv`.

`pairwise.showtest` (optional, only used if strata are supplied) When using pairwise comparison, it displays the test used to calculate p-values for pairwise comparisons. Default: F

Details

DETAILS

Examples

```
library(survival)
CreateTableOneJS(vars = names(lung), strata = "sex", data = lung)
```

`extractAIC.coxme` *extractAIC.coxme: Extract AIC from coxme.object*

Description

Extract AIC from `coxme.object`

Usage

```
## S3 method for class 'coxme'
extractAIC(fit, scale = NULL, k = 2, ...)
```

Arguments

`fit` `coxme.object`

`scale` `NULL`

`k` numeric specifying the 'weight' of the equivalent degrees of freedom (=: edf) part in the AIC formula.

`...` further arguments (currently unused in base R).

Details

DETAILS

Value

AIC(Integreted, Penalized)

Examples

```
library(coxme)
fit <- coxme(Surv(time, status) ~ ph.ecog + age + (1 | inst), lung)
extractAIC(fit)
```

 geeExp

geeExp: transform the unit of coefficients (internal function)

Description

Transform the unit of coefficients to "Coeff", "OR" or "RR"

Usage

```
geeExp(gee.coef, family = "binomial", dec)
```

Arguments

gee.coef	geeUni object.
family	Family: "gaussian", "binomial", "poisson", "quasipoisson", etc..., Default: 'binomial'
dec	Decimal point

Details

DETAILS

Value

The transformed coefficients(95

Examples

```
library(geepack)
data(dietox)
dietox$Cu <- as.factor(dietox$Cu)
gee.uni <- geeUni("Weight", c("Time", "Cu"),
  data = dietox, id.vec = dietox$Pig,
  family = "gaussian", cor.type = "exchangeable"
)
gee.exp <- geeExp(gee.uni, "binomial", 2)
```

geeglm.display	<i>geeglm.display</i>
----------------	-----------------------

Description

Make gee results from "geeglm" object

Usage

```
geeglm.display(geeglm.obj, decimal = 2)
```

Arguments

geeglm.obj	"geeglm" object
decimal	Decimal, Default: 2

Details

DETAILS

Value

List: caption, main table, metrics table

See Also

[data.table-package complete.cases](#)

Examples

```
library(geepack)
data(dietox)
dietox$Cu <- as.factor(dietox$Cu)
gee01 <- geeglm(Weight ~ Time + Cu,
  id = Pig, data = dietox,
  family = gaussian, corstr = "ex"
)
geeglm.display(gee01)
```

geeUni *geeUni: The coefficient of univariate gee (internal function)*

Description

Extract the coefficients of univariate gee using geeglm function (geepack package).

Usage

```
geeUni(y, x, data, id.vec, family, cor.type = "exchangeable")
```

Arguments

y	Dependant variable
x	Independent variable
data	Data
id.vec	Vector of id (should be ordered)
family	Family: "gaussian", "binomial", "poisson", "quasipoisson", etc...
cor.type	Correlation structure, Default: 'exchangeable'

Details

DETAILS

Value

coefficient, standard error, p-value

Examples

```
library(geepack)
data(dietox)
dietox$Cu <- as.factor(dietox$Cu)
gee.uni <- geeUni("Weight", "Time",
  data = dietox, id.vec = dietox$Pig,
  family = "gaussian", cor.type = "exchangeable"
)
```

glmshow.display	<i>glmshow.display: Show summary table of glm object.</i>
-----------------	---

Description

Show summary table of glm object(regression, logistic).

Usage

```
glmshow.display(glm.object, decimal = 2)
```

Arguments

glm.object	glm.object
decimal	digits, Default: 2

Details

DETAILS

Value

table

See Also

[glm](#)

Examples

```
glmshow.display(glm(mpg ~ wt + qsec, data = mtcars))
```

LabelepiDisplay	<i>LabelepiDisplay: Apply label information to epiDisplay object using label data</i>
-----------------	---

Description

Apply label information to epiDisplay.object using label data

Usage

```
LabelepiDisplay(epiDisplay.obj, label = F, ref)
```

Arguments

`epiDisplay.obj` `epiDisplay.object` or `glmshow.object`
`label` Apply label information, Default: F
`ref` Label data made by `mk.lev` function

Details

DETAILS

Value

`epiDisplay.object` with label information

Examples

```

fit <- glm(Sepal.Length ~ Sepal.Width + Species, data = iris)
fit.table <- glmshow.display(fit)
iris.label <- mk.lev(iris)
LabeljsCox(fit.table, label = TRUE, ref = iris.label)
  
```

LabeljsCox

LabeljsCox: Apply label information to `cox2.display` object using label data

Description

Apply label information to `cox2.display` object using label data

Usage

```
LabeljsCox(obj, ref)
```

Arguments

`obj` `cox2.display` object
`ref` Label data made by `mk.lev` function

Details

DETAILS

Value

`cox2.display` object with label information

Examples

```

library(survival)
fit <- coxph(Surv(time, status) ~ sex + ph.ecog + ph.karno + cluster(inst),
  data = lung, model = TRUE
)
fit.table <- cox2.display(fit)
lung.label <- mk.lev(lung)
LabeljsCox(fit.table, ref = lung.label)

```

LabeljsGeeglm	<i>LabeljsGeeglm: Apply label information to geeglm.display object using label data</i>
---------------	---

Description

Apply label information to geeglm.display object using label data

Usage

```
LabeljsGeeglm(obj, ref)
```

Arguments

obj	geeglm.display object
ref	Label data made by mk.lev function

Details

DETAILS

Value

geeglm.display object with label information

Examples

```

library(geepack)
library(jstable)
data(dietox)
dietox$Cu <- as.factor(dietox$Cu)
gee01 <- geeglm(Weight ~ Time + Cu,
  id = Pig, data = dietox,
  family = gaussian, corstr = "ex"
)
g1 <- geeglm.display(gee01)
LabeljsGeeglm(g1, ref = mk.lev(dietox))

```

LabeljsMetric	<i>LabeljsMetric: Apply label information to jstable metric object using label data</i>
---------------	---

Description

Apply label information to metric object of jstable using label data

Usage

```
LabeljsMetric(obj.metric, ref)
```

Arguments

obj.metric	metric of lmer.display, coxme.display
ref	Label data made by mk.lev function

Details

DETAILS

Value

metric of lmer.display, coxme.display with label information

Examples

```
library(coxme)
fit <- coxme(Surv(time, status) ~ sex + ph.ecog + ph.karno + (1 | inst) + (1 | sex), lung)
fit.table <- coxme.display(fit)
lung.label <- mk.lev(lung)
LabeljsTable(fit.table$table, ref = lung.label)
LabeljsRanef(fit.table$ranef, ref = lung.label)
LabeljsMetric(fit.table$metric, ref = lung.label)
```

LabeljsMixed	<i>LabeljsMixed: Apply label information to jstable object using label data</i>
--------------	---

Description

Apply label information to object of jstable using label data

Usage

```
LabeljsMixed(obj, ref)
```

Arguments

obj	lmer.display, coxme.display
ref	Label data made by mk.lev function

Details

DETAILS

Value

lmer.display, coxme.display with label information

Examples

```
library(coxme)
fit <- coxme(Surv(time, status) ~ sex + ph.ecog + ph.karno + (1 | inst) + (1 | sex), lung)
fit.table <- coxme.display(fit)
lung.label <- mk.lev(lung)
LabeljsMixed(fit.table, ref = lung.label)
```

LabeljsRanef	<i>LabeljsRanef: Apply label information to jstable random effect object using label data</i>
--------------	---

Description

Apply label information to ranef object of jstable using label data

Usage

```
LabeljsRanef(obj.ranef, ref)
```

Arguments

obj.ranef	ranef of lmer.display, coxme.display, cox2.display
ref	Label data made by mk.lev function

Details

DETAILS

Value

ranef of lmer.display, coxme.display, cox2.display with label information

Examples

```

library(coxme)
fit <- coxme(Surv(time, status) ~ sex + ph.ecog + ph.karno + (1 | inst) + (1 | sex), lung)
fit.table <- coxme.display(fit)
lung.label <- mk.lev(lung)
LabeljsTable(fit.table$table, ref = lung.label)
LabeljsRanef(fit.table$ranef, ref = lung.label)

```

LabeljsTable	<i>LabeljsTable: Apply label information to jstable object using label data</i>
--------------	---

Description

Apply label information to table of `geeglm.display`, `lmer.display`, `coxme.display` using label data

Usage

```
LabeljsTable(obj.table, ref)
```

Arguments

<code>obj.table</code>	table of <code>geeglm.display</code> , <code>lmer.display</code> , <code>coxme.display</code>
<code>ref</code>	Label data made by <code>mk.lev</code> function

Details

DETAILS

Value

table of `geeglm.display`, `lmer.display`, `coxme.display` with label information

Examples

```

library(coxme)
fit <- coxme(Surv(time, status) ~ sex + ph.ecog + ph.karno + (1 | inst) + (1 | sex), lung)
fit.table <- coxme.display(fit)
lung.label <- mk.lev(lung)
LabeljsTable(fit.table$table, ref = lung.label)

```

lmer.display	<i>lmer.display: table for "lmerMod" or "glmerMod" object (lme4 package)</i>
--------------	--

Description

Make mixed effect model results from "lmerMod" or "glmerMod" object (lme4 package)

Usage

```
lmer.display(lmerMod.obj, dec = 2, ci.ranef = F)
```

Arguments

lmerMod.obj	"lmerMod" or "glmerMod" object
dec	Decimal, Default: 2
ci.ranef	Show confidence interval of random effects?, Default: F

Details

DETAILS

Value

Table: fixed & random effect

Examples

```
library(geepack)
data(dietox)
dietox$Cu <- as.factor(dietox$Cu)
l1 <- lme4::lmer(Weight ~ Time + Cu + (1 | Pig) + (1 | Evit), data = dietox)
lmer.display(l1)
```

lmerExp	<i>lmerExp: transform the unit of coefficients (internal function)</i>
---------	--

Description

Transform the unit of coefficients to "Coeff", "OR" or "RR"

Usage

```
lmerExp(lmer.coef, family = "binomial", dec)
```

Arguments

lmer.coef	lmer coefficients.
family	Family: "gaussian", "binomial", "poisson", "quasipoisson", etc..., Default: 'binomial'
dec	Decimal point

Details

DETAILS

Value

The transformed coefficients(95

Examples

```
# EXAMPLE1
```

```
mk.lev
```

Export label and level: multiple variable

Description

Export label and level: multiple variable

Usage

```
mk.lev(data)
```

Arguments

data	data
------	------

Details

DETAILS

Value

default label and level data

Examples

```
mk.lev(iris)
```

mk.lev.var	<i>Export label and level: one variable</i>
------------	---

Description

Export label and level: one variable

Usage

```
mk.lev.var(data, vname)
```

Arguments

data	data
vname	variable to export label and level

Details

DETAILS

Value

if continuous variable - (label, NA), categorical variable - (label, level)

Examples

```
lapply(names(iris), function(x) {
  jstable::mk.lev.var(iris, x)
})
```

mort	<i>DATASET_TITLE</i>
------	----------------------

Description

DATASET_DESCRIPTION

Usage

```
mort
```

Format

A data frame with 17562 rows and 24 variables:

```
ccode integer COLUMN_DESCRIPTION
cname character COLUMN_DESCRIPTION
yy integer COLUMN_DESCRIPTION
mm integer COLUMN_DESCRIPTION
dd integer COLUMN_DESCRIPTION
date character COLUMN_DESCRIPTION
nonacc integer COLUMN_DESCRIPTION
cardio integer COLUMN_DESCRIPTION
respir integer COLUMN_DESCRIPTION
influenza integer COLUMN_DESCRIPTION
meanpm10 double COLUMN_DESCRIPTION
meanso2 double COLUMN_DESCRIPTION
meanno2 double COLUMN_DESCRIPTION
meanco double COLUMN_DESCRIPTION
maxco double COLUMN_DESCRIPTION
maxo3 double COLUMN_DESCRIPTION
meantemp double COLUMN_DESCRIPTION
maxtemp double COLUMN_DESCRIPTION
mintemp double COLUMN_DESCRIPTION
meanhumi double COLUMN_DESCRIPTION
meanpress double COLUMN_DESCRIPTION
season integer COLUMN_DESCRIPTION
dow integer COLUMN_DESCRIPTION
sn integer COLUMN_DESCRIPTION
```

Details

DETAILS

opt.data	<i>datable option for data(DT package)</i>
----------	--

Description

DT::datatable option for data

Usage

```
opt.data(fname)
```

Arguments

fname	File name to download
-------	-----------------------

Details

DETAILS

Value

datable option object

Examples

```
opt.data("mtcars")
```

opt.roc	<i>datable option for ROC result(DT package)</i>
---------	--

Description

DT::datable option for ROC result

Usage

```
opt.roc(fname)
```

Arguments

fname	File name to download
-------	-----------------------

Details

DETAILS

Value

datatable option object

Examples

```
options <- opt.roc("mtcars")
```

opt.simplifiedown	<i>datable option for simple download(DT package)</i>
-------------------	---

Description

Simple download DT::datatable option - No filter, No page

Usage

```
opt.simplifiedown(fname)
```

Arguments

fname	File name to download
-------	-----------------------

Details

DETAILS

Value

datatable option object

Examples

```
options <- opt.simplifiedown("mtcars")
```

opt.tb1	<i>datable option for table 1(DT package)</i>
---------	---

Description

DT::datatable option for table 1

Usage

```
opt.tb1(fname)
```

Arguments

fname File name to download

Details

DETAILS

Value

datable option object

Examples

```
options <- opt.tb1("mtcars")
```

opt.tbreg	<i>datable option for regression table(DT package)</i>
-----------	--

Description

DT::datatable option for glm, gee(geepack package), lmer/glmer(lme4 package)

Usage

```
opt.tbreg(fname)
```

Arguments

fname File name to download

Details

DETAILS

Value

datatable option object

Examples

```
options <- opt.tbreg("mtcars")
```

svycox.display *svycoxph.display: table for svycoxph.object in survey package.*

Description

Table for complex design cox model.

Usage

```
svycox.display(svycoxph.obj, decimal = 2)
```

Arguments

```
svycoxph.obj    svycoxph.object
decimal         digit, Default: 2
```

Details

DETAILS

Value

List including table, metric, caption

See Also

[svycoxph AIC](#)

Examples

```
library(survival)
data(pbc)
pbc$sex <- factor(pbc$sex)
pbc$stage <- factor(pbc$stage)
pbc$randomized <- with(pbc, !is.na(trt) & trt > 0)
biasmodel <- glm(randomized ~ age * edema, data = pbc, family = binomial)
pbc$randprob <- fitted(biasmodel)

if (is.null(pbc$albumin)) pbc$albumin <- pbc$alb ## pre2.9.0

dpsc <- survey::svydesign(
```

```
id = ~1, prob = ~randprob, strata = ~edema,
data = subset(pbc, randomized)
)

model <- survey::svycoxph(Surv(time, status > 0) ~ sex + protime + albumin + stage,
design = dpbc
)
svycox.display(model)
```

svyCreateTableOne2 *svyCreateTableOne2: Modified svyCreateTableOne function in tableone package*

Description

Combine svyCreateTableOne & print function in tableone package

Usage

```
svyCreateTableOne2(
  data,
  strata,
  vars,
  factorVars,
  includeNA = F,
  test = T,
  showAllLevels = T,
  printToggle = F,
  quote = F,
  smd = F,
  nonnormal = NULL,
  catDigits = 1,
  contDigits = 2,
  pDigits = 3,
  Labels = F,
  labeldata = NULL,
  minMax = F,
  showpm = T,
  addOverall = F,
  pairwise = F,
  pairwise.showtest = F
)
```

Arguments

data A data frame in which these variables exist. All variables (both vars and strata) must be in this data frame.

strata	Stratifying (grouping) variable name(s) given as a character vector. If omitted, the overall results are returned.
vars	Variables to be summarized given as a character vector. Factors are handled as categorical variables, whereas numeric variables are handled as continuous variables. If empty, all variables in the data frame specified in the data argument are used.
factorVars	Numerically coded variables that should be handled as categorical variables given as a character vector. Do not include factors, unless you need to relevel them by removing empty levels. If omitted, only factors are considered categorical variables. The variables specified here must also be specified in the vars argument.
includeNA	If TRUE, NA is handled as a regular factor level rather than missing. NA is shown as the last factor level in the table. Only effective for categorical variables., Default: F
test	If TRUE, as in the default and there are more than two groups, groupwise comparisons are performed, Default: T
showAllLevels	Whether to show all levels. FALSE by default, i.e., for 2-level categorical variables, only the higher level is shown to avoid redundant information., Default: T
printToggle	Whether to print the output. If FALSE, no output is created, and a matrix is invisibly returned., Default: F
quote	Whether to show everything in quotes. The default is FALSE. If TRUE, everything including the row and column names are quoted so that you can copy it to Excel easily, Default: F
smd	If TRUE, as in the default and there are more than two groups, standardized mean differences for all pairwise comparisons are calculated, Default: F
nonnormal	A character vector to specify the variables for which the p-values should be those of nonparametric tests. By default all p-values are from normal assumption-based tests (oneway.test)., Default: NULL
catDigits	Number of digits to print for proportions., Default: 1
contDigits	Number of digits to print for continuous variables. Default 2.
pDigits	Number of digits to print for p-values (also used for standardized mean differences), Default: 3
Labels	Use Label, Default: F
labeldata	labeldata to use, Default: NULL
minMax	Whether to use [min,max] instead of [p25,p75] for nonnormal variables. The default is FALSE.
showpm	Logical, show normal distributed continuous variables as Mean \pm SD. Default: T
addOverall	(optional, only used if strata are supplied) Adds an overall column to the table. Smd and p-value calculations are performed using only the stratified columns. Default: F
pairwise	(optional, only used if strata are supplied) When there are three or more strata, it displays the p-values for pairwise comparisons. Default: F


```
pairwise.showtest
```

(optional, only used if strata are supplied) When using pairwise comparison, it displays the test used to calculate p-values for pairwise comparisons. Default: F

Details

DETAILS

Value

A matrix object containing what you see is also invisibly returned. This can be assigned a name and exported via write.csv.

Examples

```
library(survey)
data(nhanes)
nhanes$SDMVPSU <- as.factor(nhanes$SDMVPSU)
nhanesSvy <- svydesign(
  ids = ~SDMVPSU, strata = ~SDMVSTRA, weights = ~WTMEC2YR,
  nest = TRUE, data = nhanes
)
svyCreateTableOne2(
  vars = c("HI_CHOL", "race", "agecat", "RIAGENDR"),
  strata = "RIAGENDR", data = nhanesSvy,
  factorVars = c("HI_CHOL", "race", "RIAGENDR")
)
```

svyCreateTableOneJS *svyCreateTableOneJS: Modified CreateTableOne function in tableone package*

Description

Combine svyCreateTableOne & print function in tableone package

Usage

```
svyCreateTableOneJS(
  vars,
  strata = NULL,
  strata2 = NULL,
  data,
  factorVars = NULL,
  includeNA = F,
  test = T,
  showAllLevels = T,
  printToggle = F,
  quote = F,
```

```

smd = F,
Labels = F,
nonnormal = NULL,
catDigits = 1,
contDigits = 2,
pDigits = 3,
labeldata = NULL,
psub = T,
minMax = F,
showpm = T,
addOverall = F,
pairwise = F,
pairwise.showtest = F
)

```

Arguments

<code>vars</code>	Variables to be summarized given as a character vector. Factors are handled as categorical variables, whereas numeric variables are handled as continuous variables. If empty, all variables in the data frame specified in the <code>data</code> argument are used.
<code>strata</code>	Stratifying grouping variable name(s) given as a character vector. If omitted, the overall results are returned.
<code>strata2</code>	Stratifying 2nd grouping variable name(s) given as a character vector. If omitted, the 1 group results are returned.
<code>data</code>	A data frame in which these variables exist. All variables (both <code>vars</code> and <code>strata</code>) must be in this data frame.
<code>factorVars</code>	Numerically coded variables that should be handled as categorical variables given as a character vector. Do not include factors, unless you need to relevel them by removing empty levels. If omitted, only factors are considered categorical variables. The variables specified here must also be specified in the <code>vars</code> argument.
<code>includeNA</code>	If TRUE, NA is handled as a regular factor level rather than missing. NA is shown as the last factor level in the table. Only effective for categorical variables., Default: F
<code>test</code>	If TRUE, as in the default and there are more than two groups, groupwise comparisons are performed, Default: T
<code>showAllLevels</code>	Whether to show all levels. FALSE by default, i.e., for 2-level categorical variables, only the higher level is shown to avoid redundant information., Default: T
<code>printToggle</code>	Whether to print the output. If FALSE, no output is created, and a matrix is invisibly returned., Default: F
<code>quote</code>	Whether to show everything in quotes. The default is FALSE. If TRUE, everything including the row and column names are quoted so that you can copy it to Excel easily, Default: F

smd	If TRUE, as in the default and there are more than two groups, standardized mean differences for all pairwise comparisons are calculated, Default: F
Labels	Use Label, Default: F
nonnormal	A character vector to specify the variables for which the p-values should be those of nonparametric tests. By default all p-values are from normal assumption-based tests (oneway.test)., Default: NULL
catDigits	Number of digits to print for proportions., Default: 1
contDigits	Number of digits to print for continuous variables. Default 2.
pDigits	Number of digits to print for p-values (also used for standardized mean differences), Default: 3
labeldata	labeldata to use, Default: NULL
psub	show sub-group p-values, Default: F
minMax	Whether to use [min,max] instead of [p25,p75] for nonnormal variables. The default is FALSE.
showpm	Logical, show normal distributed continuous variables as Mean \pm SD. Default: T
addOverall	(optional, only used if strata are supplied) Adds an overall column to the table. Smd and p-value calculations are performed using only the stratified columns. Default: F
pairwise	(optional, only used if strata are supplied) When there are three or more strata, it displays the p-values for pairwise comparisons. Default: F
pairwise.showtest	(optional, only used if strata are supplied) When using pairwise comparison, it displays the test used to calculate p-values for pairwise comparisons. Default: F

Details

DETAILS

Value

A matrix object containing what you see is also invisibly returned. This can be assigned a name and exported via write.csv.

Examples

```
library(survey)
data(nhanes)
nhanes$SDMVPSU <- as.factor(nhanes$SDMVPSU)
nhanesSvy <- svydesign(
  ids = ~SDMVPSU, strata = ~SDMVSTRA, weights = ~WTMEC2YR,
  nest = TRUE, data = nhanes
)
svyCreateTableOneJS(
  vars = c("HI_CHOL", "race", "agecat", "RIAGENDR"),
  strata = "RIAGENDR", data = nhanesSvy,
  factorVars = c("HI_CHOL", "race", "RIAGENDR")
)
```

svyregress.display	<i>svyregress.display: table for svyglm.object</i>
--------------------	--

Description

table for svyglm.object (survey package).

Usage

```
svyregress.display(svyglm.obj, decimal = 2)
```

Arguments

svyglm.obj	svyglm.object
decimal	digit, Default: 2

Details

DETAILS

Value

table

Examples

```
library(survey)
data(api)
apistrat$tt <- c(rep(1, 20), rep(0, nrow(apistrat) - 20))
dstrat <- svydesign(id = ~1, strata = ~stype, weights = ~pw, data = apistrat, fpc = ~fpc)
ds <- svyglm(api00 ~ ell + meals + cname + mobility, design = dstrat)
ds2 <- svyglm(tt ~ ell + meals + cname + mobility, design = dstrat, family = quasibinomial())
svyregress.display(ds)
svyregress.display(ds2)
```

TableSubgroupCox	<i>TableSubgroupCox: Sub-group analysis table for Cox/svycox model.</i>
------------------	---

Description

Sub-group analysis table for Cox/svycox model.

Usage

```
TableSubgroupCox(
  formula,
  var_subgroup = NULL,
  var_cov = NULL,
  data,
  time_eventrate = 3 * 365,
  decimal.hr = 2,
  decimal.percent = 1,
  decimal.pvalue = 3,
  cluster = NULL,
  strata = NULL,
  weights = NULL,
  event = FALSE,
  count_by = NULL,
  labeldata = NULL
)
```

Arguments

formula	formula with survival analysis.
var_subgroup	1 sub-group variable for analysis, Default: NULL
var_cov	Variables for additional adjust, Default: NULL
data	Data or svydesign in survey package.
time_eventrate	Time for kaplan-meier based event rate calculation, Default = 365 * 3
decimal.hr	Decimal for hazard ratio, Default: 2
decimal.percent	Decimal for percent, Default: 1
decimal.pvalue	Decimal for pvalue, Default: 3
cluster	Cluster variable for coxph, Default: NULL
strata	Strata variable for coxph, Default: NULL
weights	Weights variable for coxph, Default: NULL
event	Show number and rates of event in survival analysis default:F
count_by	Select variables to count by subgroup, Default: NULL
labeldata	Label info, made by 'mk.lev' function, Default: NULL

Details

This result is used to make forestplot.

Value

Sub-group analysis table.

See Also

[safely, map, map2 coxph svycoxph confint](#)

Examples

```
library(survival)
library(dplyr)
lung %>%
  mutate(
    status = as.integer(status == 1),
    sex = factor(sex),
    kk = factor(as.integer(pat.karno >= 70))
  ) -> lung
TableSubgroupCox(Surv(time, status) ~ sex, data = lung, time_eventrate = 100)
TableSubgroupCox(Surv(time, status) ~ sex,
  var_subgroup = "kk", data = lung,
  time_eventrate = 100
)

## survey design
library(survey)
data.design <- svydesign(id = ~1, data = lung)
TableSubgroupCox(Surv(time, status) ~ sex, data = data.design, time_eventrate = 100)
TableSubgroupCox(Surv(time, status) ~ sex,
  var_subgroup = "kk", data = data.design,
  time_eventrate = 100
)
```

TableSubgroupGLM	<i>TableSubgroupGLM: Sub-group analysis table for GLM and GLMM(lme4 package).</i>
------------------	---

Description

Sub-group analysis table for GLM.

Usage

```
TableSubgroupGLM(
  formula,
  var_subgroup = NULL,
  var_cov = NULL,
  data,
  family = "binomial",
  decimal.estimate = 2,
  decimal.percent = 1,
  decimal.pvalue = 3,
  labeldata = NULL
)
```

Arguments

formula	formula with survival analysis.
var_subgroup	1 sub-group variable for analysis, Default: NULL
var_cov	Variables for additional adjust, Default: NULL
data	Data or svydesign in survey package.
family	family, "gaussian" or "binomial" or 'poisson' or 'quasipoisson'
decimal.estimate	Decimal for estimate, Default: 2
decimal.percent	Decimal for percent, Default: 1
decimal.pvalue	Decimal for pvalue, Default: 3
labeldata	Label info, made by 'mk.lev' function, Default: NULL

Details

This result is used to make forestplot.

Value

Sub-group analysis table.

See Also

[safely, map, map2 glm svyglm](#)

Examples

```
library(survival)
library(dplyr)
lung %>%
  mutate(
    status = as.integer(status == 1),
    sex = factor(sex),
    kk = factor(as.integer(pat.karno >= 70))
  ) -> lung
TableSubgroupGLM(status ~ sex, data = lung, family = "binomial")
TableSubgroupGLM(status ~ sex, var_subgroup = "kk", data = lung, family = "binomial")

## survey design
library(survey)
data.design <- svydesign(id = ~1, data = lung)
TableSubgroupGLM(status ~ sex, data = data.design, family = "binomial")
TableSubgroupGLM(status ~ sex, var_subgroup = "kk", data = data.design, family = "binomial")
```

TableSubgroupMultiCox *TableSubgroupMultiCox: Multiple sub-group analysis table for Cox/svycox model.*

Description

Multiple sub-group analysis table for Cox/svycox model.

Usage

```
TableSubgroupMultiCox(
  formula,
  var_subgroups = NULL,
  var_cov = NULL,
  data,
  time_eventrate = 3 * 365,
  decimal.hr = 2,
  decimal.percent = 1,
  decimal.pvalue = 3,
  line = F,
  cluster = NULL,
  strata = NULL,
  weights = NULL,
  event = FALSE,
  count_by = NULL,
  labeldata = NULL
)
```

Arguments

formula	formula with survival analysis.
var_subgroups	Multiple sub-group variables for analysis, Default: NULL
var_cov	Variables for additional adjust, Default: NULL
data	Data or svydesign in survey package.
time_eventrate	Time for kaplan-meier based event rate calculation, Default = 365 * 3
decimal.hr	Decimal for hazard ratio, Default: 2
decimal.percent	Decimal for percent, Default: 1
decimal.pvalue	Decimal for pvalue, Default: 3
line	Include new-line between sub-group variables, Default: F
cluster	Cluster variable for coxph, Default: NULL
strata	Strata variable for coxph, Default: NULL
weights	Weights variable for coxph, Default: NULL

event	Show number and rates of event in survival analysis default:F
count_by	Select variables to count by subgroup, Default: NULL
labeldata	Label info, made by 'mk.lev' function, Default: NULL

Details

This result is used to make forestplot.

Value

Multiple sub-group analysis table.

See Also

[map bind](#)

Examples

```
library(survival)
library(dplyr)
lung %>%
  mutate(
    status = as.integer(status == 1),
    sex = factor(sex),
    kk = factor(as.integer(pat.karno >= 70)),
    kk1 = factor(as.integer(pat.karno >= 60))
  ) -> lung
TableSubgroupMultiCox(Surv(time, status) ~ sex,
  var_subgroups = c("kk", "kk1"),
  data = lung, time_eventrate = 100, line = TRUE
)

## survey design
library(survey)
data.design <- svydesign(id = ~1, data = lung)
TableSubgroupMultiCox(Surv(time, status) ~ sex,
  var_subgroups = c("kk", "kk1"),
  data = data.design, time_eventrate = 100
)
```

TableSubgroupMultiGLM *TableSubgroupMultiGLM: Multiple sub-group analysis table for GLM.*

Description

Multiple sub-group analysis table for GLM.

Usage

```
TableSubgroupMultiGLM(
  formula,
  var_subgroups = NULL,
  var_cov = NULL,
  data,
  family = "binomial",
  decimal.estimate = 2,
  decimal.percent = 1,
  decimal.pvalue = 3,
  line = F,
  labeldata = NULL
)
```

Arguments

formula	formula with survival analysis.
var_subgroups	Multiple sub-group variables for analysis, Default: NULL
var_cov	Variables for additional adjust, Default: NULL
data	Data or svydesign in survey package.
family	family, "gaussian" or "binomial" or 'poisson' or 'quasipoisson'
decimal.estimate	Decimal for estimate, Default: 2
decimal.percent	Decimal for percent, Default: 1
decimal.pvalue	Decimal for pvalue, Default: 3
line	Include new-line between sub-group variables, Default: F
labeldata	Label info, made by 'mk.lev' function, Default: NULL

Details

This result is used to make forestplot.

Value

Multiple sub-group analysis table.

See Also

[map bind](#)

Examples

```
library(survival)
library(dplyr)
lung %>%
  mutate(
```

```
      status = as.integer(status == 1),
      sex = factor(sex),
      kk = factor(as.integer(pat.karno >= 70)),
      kk1 = factor(as.integer(pat.karno >= 60))
    ) -> lung
TableSubgroupMultiGLM(status ~ sex,
  var_subgroups = c("kk", "kk1"),
  data = lung, line = TRUE, family = "binomial"
)

## survey design
library(survey)
data.design <- svydesign(id = ~1, data = lung)
TableSubgroupMultiGLM(status ~ sex,
  var_subgroups = c("kk", "kk1"),
  data = data.design, family = "binomial"
)
```

Index

- * **datasets**
 - mort, 25
- AIC, 30
- arrange, 4

- bind, 41, 42
- bind_rows, 4

- coefNA, 3
- complete.cases, 15
- confint, 38
- count_event_by, 3
- cox2.display, 4
- coxExp, 5
- coxme.display, 6
- coxmeTable, 6
- coxph, 38
- CreateTableOne2, 7
- CreateTableOneJS, 10

- extractAIC.coxme, 13

- geeExp, 14
- geeglm.display, 15
- geeUni, 16
- glm, 17, 39
- glmshow.display, 17
- group_by, 4

- LabelepiDisplay, 17
- LabeljsCox, 18
- LabeljsGeeglm, 19
- LabeljsMetric, 20
- LabeljsMixed, 20
- LabeljsRanef, 21
- LabeljsTable, 22
- lmer.display, 23
- lmerExp, 23

- map, 38, 39, 41, 42

- map2, 38, 39
- mk.lev, 24
- mk.lev.var, 25
- mort, 25
- mutate, 4

- opt.data, 27
- opt.roc, 27
- opt.simplifiedown, 28
- opt.tb1, 29
- opt.tbreg, 29

- safely, 38, 39
- summarise, 4
- svycox.display, 30
- svycoxph, 30, 38
- svyCreateTableOne2, 31
- svyCreateTableOneJS, 33
- svyglm, 39
- svyregress.display, 36

- TableSubgroupCox, 36
- TableSubgroupGLM, 38
- TableSubgroupMultiCox, 40
- TableSubgroupMultiGLM, 41