**Package ‘ppcor’**

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**Title** Partial and Semi-Partial (Part) Correlation  
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**Description** Calculates partial and semi-partial (part) correlations along with p-value.  
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**Description**

Calculates partial and semi-partial (part) correlations along with p value.

**Details**
Author(s)

Seongho Kim <biostatistician.kim@gmail.com>

References


Examples

# data
y.data <- data.frame(
  hl=c(7,15,19,15,21,22,57,15,20,18),
  disp=c(0.000,0.964,0.000,0.000,0.921,0.000,0.000,1.006,0.000,1.011),
  deg=c(9,2,3,4,1,3,1,3,6,1),
  BC=c(1.78e-02,1.05e-06,1.37e-05,7.18e-03,0.00e+00,0.00e+00,0.00e+00,
       4.48e-03,2.10e-06,0.00e+00)
)

# partial correlation
pcor(y.data)

# partial correlation between "hl" and "disp" given "deg" and "BC"
pcor.test(y.data$h1,y.data$disp,y.data[,c("deg","BC")])
pcor.test(y.data[,1],y.data[,2],y.data[,c(3:4)])
pcor.test(y.data[,1],y.data[,2],y.data[-c(1:2)])

# semi-partial (part) correlation
spcor(y.data)

# semi-partial (part) correlation between "hl" and "disp" given "deg" and "BC"
spcor.test(y.data$h1,y.data$disp,y.data[,c("deg","BC")])
spcor.test(y.data[,1],y.data[,2],y.data[,c(3:4)])
spcor.test(y.data[,1],y.data[,2],y.data[-c(1:2)])
Description

The function `pcor` can calculate the pairwise partial correlations for each pair of variables given others. In addition, it gives us the p value as well as statistic for each pair of variables.

Usage

```r
pcor(x, method = c("pearson", "kendall", "spearman"))
```

Arguments

- `x` a matrix or data frame.
- `method` a character string indicating which partial correlation coefficient is to be computed. One of "pearson" (default), "kendall", or "spearman" can be abbreviated.

Details

Partial correlation is the correlation of two variables while controlling for a third or more other variables. When the determinant of variance-covariance matrix is numerically zero, Moore-Penrose generalized matrix inverse is used. In this case, no p-value and statistic will be provided if the number of variables are greater than or equal to the sample size.

Value

- `estimate` a matrix of the partial correlation coefficient between two variables
- `p.value` a matrix of the p value of the test
- `statistic` a matrix of the value of the test statistic
- `n` the number of samples
- `gn` the number of given variables
- `method` the correlation method used

Note

Missing values are not allowed.

Author(s)

Seongho Kim <biostatistician.kim@gmail.com>

References

See Also

cor.test, spcor, spcor.test

Examples

```r
# data
y.data <- data.frame(
  hl=c(7,15,19,15,21,22,57,15,20,18),
  disp=c(0.000, 0.964, 0.000, 0.000, 0.921, 0.000, 0.000, 1.006, 0.000, 1.011),
  deg=c(9,2,3,4,1,3,1,3,6,1),
  BC=c(1.78e-02, 1.05e-06, 1.37e-05, 7.18e-03, 0.00e+00, 0.00e+00, 0.00e+00,
       4.48e-03, 2.10e-06, 0.00e+00)
)
# partial correlation
pcor(y.data)
```

---

**pcor.test**

*Partial correlation for two variables given a third variable.*

Description

The function `pcor.test` can calculate the pairwise partial correlations between two variables. In addition, it gives us the p value as well as statistic.

Usage

```r
pcor.test(x, y, z, method = c("pearson", "kendall", "spearman"))
```

Arguments

- `x`: a numeric vector.
- `y`: a numeric vector.
- `z`: a numeric vector.
- `method`: a character string indicating which partial correlation coefficient is to be computed. One of "pearson" (default), "kendall", or "spearman" can be abbreviated.

Details

Partial correlation is the correlation of two variables while controlling for a third variable. When the determinant of variance-covariance matrix is numerically zero, Moore-Penrose generalized matrix inverse is used. In this case, no p-value and statistic will be provided if the number of variables are greater than or equal to the sample size.
pcor.test

Value

- **estimate**: the partial correlation coefficient between two variables
- **p.value**: the p value of the test
- **statistic**: the value of the test statistic
- **n**: the number of samples
- **gn**: the number of given variables
- **method**: the correlation method used

Note

Missing values are not allowed

Author(s)

Seongho Kim <biostatistician.kim@gmail.com>

References


See Also

- pcor
- spcor
- spcor.test

Examples

```r
# data
y.data <- data.frame(hl=c(7,15,19,15,21,22,57,15,20,18),
                     disp=c(0.000,0.964,0.000,0.000,0.921,0.000,0.000,1.006,0.000,1.011),
                     deg=c(9,2,3,4,1,3,1,3,6,1),
                     bc=c(1.78e-02,1.05e-06,1.37e-05,7.18e-03,0.00e+00,0.00e+00,0.00e+00,0.00e+00,
                         4.48e-03,2.10e-06,0.00e+00)
)

# partial correlation between "hl" and "disp" given "deg" and "BC"
pcor.test(y.data$h1,y.data$disp,y.data[,c("deg","BC")])
pcor.test(y.data[,1],y.data[,2],y.data[,c(3:4)])
pcor.test(y.data[,1],y.data[,2],y.data[,-c(1:2)])
```
spcor  

_Semi-partial (part) correlation_

**Description**

The function `spcor` can calculate the pairwise semi-partial (part) correlations for each pair of variables given others. In addition, it gives us the p value as well as statistic for each pair of variables.

**Usage**

`spcor(x, method = c("pearson", "kendall", "spearman"))`

**Arguments**

- `x`: a matrix or data frame.
- `method`: a character string indicating which semi-partial (part) correlation coefficient is to be computed. One of "pearson" (default), "kendall", or "spearman" can be abbreviated.

**Details**

Semi-partial correlation is the correlation of two variables with variation from a third or more other variables removed only from the second variable. When the determinant of variance-covariance matrix is numerically zero, Moore-Penrose generalized matrix inverse is used. In this case, no p-value and statistic will be provided if the number of variables are greater than or equal to the sample size.

**Value**

- `estimate`: a matrix of the semi-partial (part) correlation coefficient between two variables
- `p.value`: a matrix of the p value of the test
- `statistic`: a matrix of the value of the test statistic
- `n`: the number of samples
- `gn`: the number of given variables
- `method`: the correlation method used

**Note**

Missing values are not allowed.

**Author(s)**

Seongho Kim <<biostatistician.kim@gmail.com>>
spcor.test

References


See Also

spcor.test, pcor, pcor.test

Examples

# data
y.data <- data.frame(  
  hl=c(7,15,15,21,22,57,15,20,18),  
  disp=c(0.000,0.964,0.000,0.000,0.921,0.000,0.000,1.006,0.000,1.011),  
  deg=c(9,2,3,4,1,3,1,3,6,1),  
  BC=c(1.78e-02,1.05e-06,1.37e-05,7.18e-03,0.00e+00,0.00e+00,0.00e+00,  
       4.48e-03,2.10e-06,0.00e+00)  
)

# semi-partial (part) correlation
spcor(y.data)

spcor.test  Semi-partial (part) correlation for two variables given a third variable.

Description

The function spcor.test can calculate the pairwise semi-partial (part) correlations between two variables. In addition, it gives us the p value as well as statistic.

Usage

spcor.test(x, y, z, method = c("pearson", "kendall", "spearman"))

Arguments

x  a numeric vector.
y  a numeric vector.
z  a numeric vector.
method  a character string indicating which partial correlation coefficient is to be computed. One of "pearson" (default), "kendall", or "spearman" can be abbreviated.

Details

Semi-partial correlation is the correlation of two variables with variation from a third variable removed only from the second variable. When the determinant of variance-covariance matrix is numerically zero, Moore-Penrose generalized matrix inverse is used. In this case, no p-value and statistic will be provided if the number of variables are greater than or equal to the sample size.
Value

- **estimate**: the semi-partial (part) correlation coefficient between two variables
- **p.value**: the p value of the test
- **statistic**: the value of the test statistic
- **n**: the number of samples
- **gn**: the number of given variables
- **method**: the correlation method used

Note

Missing values are not allowed

Author(s)

Seongho Kim <<biostatistician.kim@gmail.com>>

References


See Also

- `spcor`
- `pcor`
- `pcor.test`

Examples

```r
# data
y.data <- data.frame(
  hl=c(7,15,19,21,22,57,15,20,18),
  disp=c(0.000,0.964,0.000,0.000,0.921,0.000,0.000,1.006,0.000,1.011),
  deg=c(9,2,3,4,1,3,1,3,6,1),
  bc=c(1.78e-02,1.05e-06,1.37e-05,7.18e-03,0.00e+00,0.00e+00,0.00e+00,
      4.48e-03,2.10e-06,0.00e+00)
)

# semi-partial (part) correlation between "hl" and "disp" given "deg" and "BC"
spcor.test(y.data$hl,y.data$disp,y.data[,c("deg","BC")])
spcor.test(y.data[,1],y.data[,2],y.data[,c(3:4)])
spcor.test(y.data[,1],y.data[,2],y.data[,c(-1:2)])
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