

# Package ‘ircor’

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**Title** Correlation Coefficients for Information Retrieval

**Version** 1.0

**Description** Provides implementation of various correlation coefficients of common use in Information Retrieval. In particular, it includes Kendall (1970, isbn:0852641990) tau coefficient as well as tau\_a and tau\_b for the treatment of ties. It also includes Yilmaz et al. (2008) <doi:10.1145/1390334.1390435> tauAP correlation coefficient, and versions tauAP\_a and tauAP\_b developed by Urbano and Marrero (2017) <doi:10.1145/3121050.3121106> to cope with ties.

**Depends** R (>= 3.2.0)

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**BugReports** <https://github.com/julian-urbano/ircor/issues>

**URL** <https://github.com/julian-urbano/ircor/>

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 6.0.1

**Suggests** testthat

**NeedsCompilation** no

**Author** Julián Urbano [aut, cre],  
Mónica Marrero [aut]

**Maintainer** Julián Urbano <urbano.julian@gmail.com>

**Repository** CRAN

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tau

*Kendall  $\tau$  Rank Correlation Coefficients*

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### Description

tau is the rank correlation coefficient by Kendall, where neither vector can contain tied items. tau\_a and tau\_b are the versions developed to cope with ties under the scenarios of accuracy and agreement, respectively. See the references for details.

### Usage

```
tau(x, y)
```

```
tau_a(x, y)
```

```
tau_b(x, y)
```

### Arguments

x a numeric vector. In tau\_a this is the vector of true scores.

y a numeric vector of the same length as x. In tau\_a this is the vector of estimated scores.

### Value

The correlation coefficient.

### References

M.G. Kendall (1970). Rank Correlation Methods. Charles Griffin & Company Limited.

### See Also

[tauAP](#) for AP correlation coefficients.

### Examples

```
# No ties
x <- c(0.67, 0.45, 0.29, 0.12, 0.57, 0.24, 0.94, 0.75, 0.08, 0.54)
y <- c(0.48, 0.68, 0.32, 0.09, 0.06, 0.61, 0.87, 0.22, 0.44, 0.84)
tau(x, y)
tau_a(x,y) # same as tau
tau_b(x,y) # same as tau

# Ties in y
y <- round(y, 1)
tau_a(x, y)
tau_b(x, y)
```

```
# Ties in x too
x <- round(x, 1)
tau_b(x, y)
```

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tauAP

*AP Rank Correlation Coefficients*

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### Description

tauAP is the AP rank correlation coefficient by Yilmaz et al., where neither vector can contain tied items. tauAP\_a and tauAP\_b are the versions developed by Urbano and Marrero to cope with ties under the scenarios of accuracy and agreement, respectively. See the references for details.

### Usage

```
tauAP(x, y, decreasing = TRUE)
```

```
tauAP_a(x, y, decreasing = TRUE)
```

```
tauAP_b(x, y, decreasing = TRUE)
```

### Arguments

x	a numeric vector. In tauAP_a this is the vector of true scores.
y	a numeric vector of the same length as x. In tauAP_a this is the vector of estimated scores.
decreasing	logical. Should the sort order be increasing or decreasing (default)?

### Details

Note that the sorting order is decreasing by default, as should be for instance if the scores represent the effectiveness of systems. When the sorting order is ascending, as is for instance when the vectors represent ranks, the parameter decreasing must be set to FALSE.

### Value

The correlation coefficient.

### References

E. Yilmaz, J.A. Aslam and S. Robertson (2008). A New Rank Correlation Coefficient for Information Retrieval. ACM SIGIR.

J. Urbano and M. Marrero (2017). The Treatment of Ties in AP Correlation. ACM ICTIR.

### See Also

[tau](#) for Kendall correlation coefficients.

**Examples**

```
# No ties
x <- c(0.67, 0.45, 0.29, 0.12, 0.57, 0.24, 0.94, 0.75, 0.08, 0.54)
y <- c(0.48, 0.68, 0.32, 0.09, 0.06, 0.61, 0.87, 0.22, 0.44, 0.84)
tauAP(x, y)
tauAP_a(x,y) # same as tauAP

# Ties in y
y <- round(y, 1)
tauAP_a(x, y)
tauAP_b(x, y)

# Ties in x too
x <- round(x, 1)
tauAP_b(x, y)

# Set decreasing to FALSE when x and y already represent ranks
x <- rank(-x)
y <- rank(-y)
tauAP_b(x, y, FALSE) # same as above
```

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