

Package ‘pridit’

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Type Package

Title Principal Component Analysis Applied to Ridit Scoring

Version 1.1.0

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Description Implements the 'PRIDIT' (Principal Component Analysis applied to 'RIDITs') scoring system described in Brockett et al. (2002) <doi:10.1111/1539-6975.00027>. Provides functions for ridit scoring originally developed by Bross (1958) <doi:10.2307/2527727>, calculating 'PRIDIT' weights, and computing final 'PRIDIT' scores for multivariate analysis of ordinal data.

License Apache License (>= 2)

URL <https://github.com/rlietherthal/PRIDIT>

BugReports <https://github.com/rlietherthal/PRIDIT/issues>

Encoding UTF-8

LazyData true

Depends R (>= 4.0.0)

Suggests testthat (>= 3.0.0), knitr, rmarkdown

VignetteBuilder knitr

NeedsCompilation no

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Repository CRAN

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`pridit`*pridit: Principal Component Analysis Applied to Ridit Scoring*

Description

The `pridit` package provides functions for implementing the PRIDIT (Principal Component Analysis applied to RIDITs) scoring system.

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See Also

Useful links:

- <https://github.com/rlieberthal/PRIDIT>
- Report bugs at <https://github.com/rlieberthal/PRIDIT/issues>

`PRIDITscore`*Calculate the PRIDIT scores for a ridit matrix*

Description

This function takes ridit scores and PRIDIT weights to calculate final PRIDIT scores for each observation.

Usage

```
PRIDITscore(riditscores, id_vector, weightvec)
```

Arguments

<code>riditscores</code>	A data frame where the first column represents IDs. The IDs uniquely identify each row in the matrix. The remaining columns contain the ridit scores for each ID.
<code>id_vector</code>	A vector of IDs corresponding to the observations.
<code>weightvec</code>	A numeric vector of PRIDIT weights (from <code>PRIDITweight</code> function).

Value

A data frame with two columns: "Claim.ID" containing the IDs and "PRIDITscore" containing the calculated PRIDIT scores (ranging from -1 to 1).

References

Brockett, P. L., Derrig, R. A., Golden, L. L., Levine, A., & Alpert, M. (2002). Fraud classification using principal component analysis of RIDITs. *Journal of Risk and Insurance*, 69(3), 341-371.

Examples

```
# Complete workflow example
test_data <- data.frame(
  ID = c("A", "B", "C", "D", "E"),
  var1 = c(0.9, 0.85, 0.89, 1.0, 0.89),
  var2 = c(0.99, 0.92, 0.90, 1.0, 0.93),
  var3 = c(1.0, 0.99, 0.98, 1.0, 0.99)
)

# Step 1: Calculate ridit scores
ridit_result <- ridit(test_data)

# Step 2: Calculate PRIDIT weights
weights <- PRIDITweight(ridit_result)

# Step 3: Calculate final PRIDIT scores
final_scores <- PRIDITscore(ridit_result, test_data$ID, weights)
print(final_scores)
```

PRIDITweight

Calculate the PRIDIT weights for a ridit matrix

Description

This function takes a ridit-scored matrix and returns PRIDIT weights for each variable as a vector using Principal Component Analysis.

Usage

```
PRIDITweight(riditscores)
```

Arguments

riditscores	A data frame where the first column represents IDs. The IDs uniquely identify each row in the matrix. The remaining columns contain the ridit scores for each ID.
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Value

A numeric vector containing PRIDIT weights for each variable.

References

Brockett, P. L., Derrig, R. A., Golden, L. L., Levine, A., & Alpert, M. (2002). Fraud classification using principal component analysis of RIDITs. *Journal of Risk and Insurance*, 69(3), 341-371.

Examples

```
# Create sample data and calculate ridit scores first
test_data <- data.frame(
  ID = c("A", "B", "C", "D", "E"),
  var1 = c(0.9, 0.85, 0.89, 1.0, 0.89),
  var2 = c(0.99, 0.92, 0.90, 1.0, 0.93),
  var3 = c(1.0, 0.99, 0.98, 1.0, 0.99)
)

# First calculate ridit scores
ridit_result <- ridit(test_data)

# Then calculate PRIDIT weights
weights <- PRIDITweight(ridit_result)
print(weights)
```

ridit

Calculate the ridit values for a matrix

Description

This function takes a matrix of data and returns the matrix transformed as ridit values using the method developed by Bross (1958) and modified by Brockett et al. (2002).

Usage

```
ridit(allrawdata)
```

Arguments

allrawdata	A data frame where the first column represents IDs. The IDs uniquely identify each row in the matrix. The remaining columns contain the numerical data for each ID.
------------	---

Value

A data frame with the first column containing IDs (named "Claim.ID") and the remaining columns containing ridit scores for each variable.

References

- Bross, I. D. (1958). How to use ridit analysis. *Biometrics*, 14(1), 18-38. doi:10.2307/2527727
- Brockett, P. L., Derrig, R. A., Golden, L. L., Levine, A., & Alpert, M. (2002). Fraud classification using principal component analysis of RIDITs. *Journal of Risk and Insurance*, 69(3), 341-371. doi:10.1111/15396975.00027

Examples

```
# Create sample data
test_data <- data.frame(
  ID = c("A", "B", "C", "D", "E"),
  var1 = c(0.9, 0.85, 0.89, 1.0, 0.89),
  var2 = c(0.99, 0.92, 0.90, 1.0, 0.93),
  var3 = c(1.0, 0.99, 0.98, 1.0, 0.99)
)

# Calculate ridit scores
ridit_result <- ridit(test_data)
print(ridit_result)
```

test

Test dataset for PRIDIT analysis

Description

A sample dataset containing health quality metrics for 5 healthcare providers, used to demonstrate the PRIDIT scoring methodology.

Usage

```
test
```

Format

A data frame with 5 rows and 4 variables:

- ID** Character. Unique identifier for each healthcare provider (A through E)
- Smoking_cessation** Numeric. Smoking cessation counseling rate (0.85-1.0)
- ACE_Inhibitor** Numeric. ACE inhibitor prescription rate (0.90-1.0)
- Proper_Antibiotic** Numeric. Proper antibiotic usage rate (0.98-1.0)

Source

Synthetic data created for package examples

Examples

```
data(test)
head(test)

# Calculate PRIDIT scores
ridit_scores <- ridit(test)
weights <- PRIDITweight(ridit_scores)
final_scores <- PRIDITscore(ridit_scores, test$ID, weights)
```

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