

Package ‘itemanalysis’

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Title Classical Test Theory Item Analysis

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Depends ggplot2, polycor, car

Description Runs classical item analysis for multiple-choice test items and polytomous items (e.g., rating scales). The statistics reported in this package can be found in any measurement textbook such as Crocker and Algina (2006, ISBN:9780495395911).

License GPL (>= 2)

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NeedsCompilation no

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dichotomous

Raw data from a multiple-choice test

Description

The data is taken from the following website <http://www.jmetrik.com/example-data.php>. This file includes nominal responses of 6,000 examinees to 56 binary items.

Usage

```
data(dichotomous)
```

Format

A data frame with 60000 examinees and 56 items

itemanalysis

itemanalysis: Classical Test Theory Item Analysis

Description

This package

Details

| | |
|-----------|------------|
| Package: | ITEMAN |
| Type: | Package |
| Version: | 1.0 |
| Date: | 2015-09-29 |
| License: | GPL-2 |
| LazyLoad: | yes |

The package can be used to run classical item analysis for multiple-choice test items and polytomously scored items (e.g., rating scale items).

Author(s)

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See Also

[itemanalysis1](#) for running classical item analysis for multiple-choice test items [itemanalysis2](#) for running classical item analysis for polytomously scored items

`itemanalysis1`*Classical Test Theory Item Analysis for Multiple-Choice Test Items*

Description

Classical Test Theory Item Analysis for Multiple-Choice Test Items

Usage

```
itemanalysis1(data, key, options, ngroup = ncol(data) + 1, correction = TRUE)
```

Arguments

| | |
|-------------------------|--|
| <code>data</code> | a data frame with N rows and m columns, with N denoting the number of subjects and m denoting the number of items. |
| <code>key</code> | a vector of answer key with a length of m |
| <code>options</code> | a vector of response options for the test such as <code>c("A","B","C","D")</code> |
| <code>ngroup</code> | number of score groups to be use for plotting the item trace lines |
| <code>correction</code> | TRUE or FALSE. If it is TRUE, then an adjustment is made for point-biserial correlation. |

Details

To be added later.

Value`plots` a list object storing the item trace line plots for each item**Author(s)**

Cengiz Zopluoglu

See Also[itemanalysis2](#) for classical item analysis of polytomously scored items**Examples**

```
data(dichotomous)
head(dichotomous)
str(dichotomous)

# Key response vector

key <- c("A", "D", "C", "B", "C", "B", "C", "D", "A", "D", "C", "A", "D", "C", "A",
```

```

"B","D","B","A","C","A","A","C","B","C","B","D","A","A","A",
"C","B","B","A","B","D","D","A","D","C","D","A","B","B","C",
"D","B","C","C","B","D","A","C","B","A","D")

# Use itemanalysis1 function to run the item analysis

# In order to reduce running time for the example below,
# I specify "data=dichotomous[,1:10]", so it only analyze the
# first 10 items.
# You should specify "data=dichotomous" to analyze based on 56 items.

item.analysis <- itemanalysis1(data=dichotomous[,1:10],
                              key=key,
                              options=c("A","B","C","D"),
                              ngroup=10,
                              correction=FALSE)

# item.analysis$plots[[1]] # Item Trace Line for the first item
# item.analysis$plots[[2]] # Item Trace Line for the second item
# item.analysis$plots[[3]] # Item Trace Line for the third item
# item.analysis$plots[[4]] # Item Trace Line for the fourth item
# item.analysis$plots[[5]] # Item Trace Line for the fifth item
# item.analysis$plots[[6]] # Item Trace Line for the sixth item
# item.analysis$plots[[7]] # Item Trace Line for the seventh item
# item.analysis$plots[[8]] # Item Trace Line for the eighth item
# item.analysis$plots[[9]] # Item Trace Line for the ninth item
# item.analysis$plots[[10]] # Item Trace Line for the tenth item

```

itemanalysis2

Classical Test Theory Item Analysis for Polytomous Items

Description

Classical Test Theory Item Analysis for Polytomous Items

Usage

```
itemanalysis2(data, options, ngroup = ncol(data) + 1, correction = TRUE)
```

Arguments

| | |
|------------|---|
| data | a data frame with N rows and m columns, with N denoting the number of subjects and m denoting the number of items. |
| options | a vector of numerical code of the response categories available for the items such as c(0,1,2,3). The minimum score is assumed to be 0. |
| ngroup | number of score groups to be use for plotting the item trace lines |
| correction | TRUE or FALSE. If it is TRUE, then an adjustment is made for point-biserial correlation. |

Details

to be added later

Value

plots a list object storing the item trace line plots for each item

Author(s)

Cengiz Zopluoglu

See Also

[itemanalysis1](#) for classical item analysis of multiple-choice test items

Examples

```
data(timss2011_usa)

timss2011_usa$Q14B <- recode(var = timss2011_usa$Q14B,
                           recodes = "c(0)=3;c(1)=2;c(2)=1;c(3)=0")

timss2011_usa$Q14C <- recode(var = timss2011_usa$Q14C,
                           recodes = "c(0)=3;c(1)=2;c(2)=1;c(3)=0")

item.analysis <- itemanalysis2(data=timss2011_usa,
                              options=c(0,1,2,3),
                              ngroup=18,
                              correction=FALSE)

# item.analysis$plots[[1]] # Item Trace Line for the first item
# item.analysis$plots[[2]] # Item Trace Line for the second item
# item.analysis$plots[[3]] # Item Trace Line for the third item
# item.analysis$plots[[4]] # Item Trace Line for the fourth item
# item.analysis$plots[[5]] # Item Trace Line for the fifth item
# item.analysis$plots[[6]] # Item Trace Line for the sixth item
```

timms2011_usa

TIMMS 2011 USA Data - Attitude Towards Math

Description

The data is a subset of TIMSS 2011 USA data and includes responses for six statements to measure attitudes towards math. These rating scale items have response codes from 0 to 3 with 0 indicating "I strongly disagree", 1 indicating "I disagree", 2 indicating "I agree", and 3 indicating "I strongly agree" for a given statement. Note that items 14B and 14C has to be reverse coded before analysis to make them consistent with other four items.

Usage

```
data(timss2011_usa)
```

Format

A data frame with 10079 observaiton and 6 items.

Q14A I enjoy learning mathematics

Q14B I wish have not to study Math

Q14C Mathematics is boring

Q14D I learn interesting things in mathematics class

Q14E I like mathematics

Q14F I think it's important to do well in mathematics

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