Package 'PsyControl'

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Title CUSUM Person Fit Statistics

Version 1.0.0.0

Description Person fit statistics based on Quality Control measures are provided for questionnaires and tests given a specified IRT model. Statistics based on Cumulative Sum (CUSUM) charts are provided. Options are given for banks with polytomous and dichotomous data.

Depends R (>= 3.3.3)

License GPL-2

Encoding UTF-8

LazyData true

RoxygenNote 6.0.1

Imports ltm, irtoys, stats, graphics

NeedsCompilation no

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Contents

cusum — *Generates CUSUM values for Rasch, 2PL and 3PL IRT model based on the Van Krimpen-Stoop & Meijer, (2002).*

Description

Generates CUSUM values for Rasch, 2PL and 3PL IRT model based on the Van Krimpen-Stoop & Meijer, (2002).

Usage

```
cusum(dat, ipar = NULL, abi = NULL, IRTmodel = "2PL")
```

Arguments

dat	a nxp matrix with n participants and p items. Responses are in 0 1 format.
ipar	a pxk matrix with given item parameters p items and k item parameters. ipar[,1] discrimination; ipar[,2] item difficulty; ipar[,3] guessing-parameter.
abi	a vector n ability. If not provided, estimated using Expected a Posteriori method.
IRTmodel	specify the IRT model ("1PL", "2PL", "3PL"). Default is "2PL"

Value

Returns matrix with with lower and upper cusum statistics for dat.

References

Van Krimpen-Stoop, E. M., & Meijer, R. R. (2002). Detection of person misfit in computerized adaptive tests with polytomous items. Applied Psychological Measurement, 26(2), 164-180.

Examples

```
data(ex2PL)
cusum(dat = ex2PL)
```

cusum.cutoff — *Generates critical values for CUSUM statisitcs.*

Description

cusum.cutoff Generates a bootstrap sample for cut-off scores.

Usage

```
cusum.cutoff(cusum.obj, upp = 0.975, low = 0.025, Breps = 1000)
```

Arguments

cusum.obj	an object returned from cusum or cusum.poly
upp	user specified upper tail cut off. Default is .975
low	user specified lower tail cut off. Default is .025
Breps	number of bootstrap samples

Value

Returns a matrix of lower and upper cut off values and corresponding standard deviations based on bootstrap sample.

---

cusum.flag *Flags aberrant participants based on CUSUM statistics.*

Description

Flags aberrant participants based on CUSUM statistics.

Usage

```
cusum.flag(cusum.obj, cutoff.obj, cut = NULL)
```

Arguments

cusum.obj	an object returned from cusum or cusum.poly
cutoff.obj	an object returned from cusum.cutoff
cut	a vector for user specified cut offs (e.g c(1,1)). The first value is the upper limit. The second value is the lower limit.

Value

Returns a true or false matrix whether a person is aberrantly responding.

cusum.plot — *Generates CUSUM plot for specified IDs.*

Description

Generates CUSUM plot for specified IDs.

Usage

```
cusum.plot(cu.object, ID)
```

Arguments

cu.object	an object returned from cusum or cusum.poly
ID	a numeric ID.

Value

Returns a plot for specified cusum person chart.

cusum.poly — *Generates CUSUM values for polytomous IRT model based on Van Krimpen-Stoop & Meijer, (2002).*

Description

Generates CUSUM values for polytomous IRT model based on Van Krimpen-Stoop & Meijer, (2002).

Usage

```
cusum.poly(dat, NCat, ipar = NULL, abi = NULL, IRTmodel = "GRM")
```

Arguments

dat	a nxp matrix with n participants and p items. Responses are in 0 as the lowest scores format.
NCat	number of categories for each item.
ipar	a pxk matrix with given item parameters p items and k item parameters. Item difficulty under the "GRM" or item steps under "PCM" or "GPCM" are in the first columns. The last column is the discrimination parameter.
abi	a vector n ability
IRTmodel	specify the IRT model ("GRM","PCM","GPCM"). Default is "GRM".

Value

Returns matrix with with lower and upper cusum statistics for `dat`.

References

Van Krimpen-Stoop, E. M., & Meijer, R. R. (2002). Detection of person misfit in computerized adaptive tests with polytomous items. Applied Psychological Measurement, 26(2), 164-180.

Examples

```
data(exGRM)
cusum.poly(dat = exGRM, NCat = 6)
```

---

ex2PL *Example data set based on a simulated 2PL model.*

Description

Example data set based on a simulated 2PL model.

Usage

```
data(ex2PL)
```

Format

A data frame with 200 rows and 10 variables.

Source

Simulated data.

---

exGRM *Example data set based on a simulated GRM model.*

Description

Example data set based on a simulated GRM model.

Usage

```
data(exGRM)
```

Format

A data frame with 200 rows and 10 variables.

Source

Simulated data.

---

gh *Example data set based on a simulated GRM model.*

Description

Example data set based on a simulated GRM model.

Usage

```
gh
```

Format

Gaussian-Hermite Quadature points

Source

ltm

Index