R deltaScoring package description

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1 Instalation

2 Item responses

The dihotomous item response (0/1) should be in a numeric array. For example

```
install.packages("random")
library("random")

itemData<- randomNumbers(n = 5000,min = 0,max = 1,col = 20)
```

3 Estimating item delta

Estimating the main item parameter **delta**, reffered as δ in the refferences is estimated by a bootstrap procedure

```
Itm<-dS.deltaBootstrap(itemData)
```

The result is a list with **delta** and **conf** fields, containig delta values and their 90% confidence interval respectivelly.

```
> Itm$delta
      delta
 [1,] 0.492
 [2,] 0.500
 [3,] 0.508
 [4,] 0.544
 [5,] 0.464
 [6,] 0.504
 [7,] 0.496
 [8,] 0.508
 [9,] 0.516
 .
 .
 .

> Itm$conf
       0.05   0.95
 [1,] 0.4400 0.5480
 [2,] 0.4480 0.5520
 [3,] 0.4560 0.5600
 [4,] 0.4920 0.5960
 [5,] 0.4120 0.5200
 .
 .
 .
```

4 Person D-score

Person D-score (see [1]) is caclulated by the person response vector and the item deltas

```
Dscores<-dS.personDscore(itemData,Itm$delta)
```

```
> Dscores
          [,1]
[1,] 0.5521669
[2,] 0.7018459
[3,] 0.5565811
[4,] 0.3976726
[5,] 0.4069021
[6,] 0.4434189
[7,] 0.5425361
[8,] 0.5052167
.
.
.
```

5 Fit RFM Model

The RFM model defines the probability for coresct tem performace as 1,2 or 3 parametric function [1]. The corresponding paramters (b, s, c) are estimated for any item in the test. The fitted `parameters`, `p-Values` and standard errors `SE` are returned in the list `Fit`.

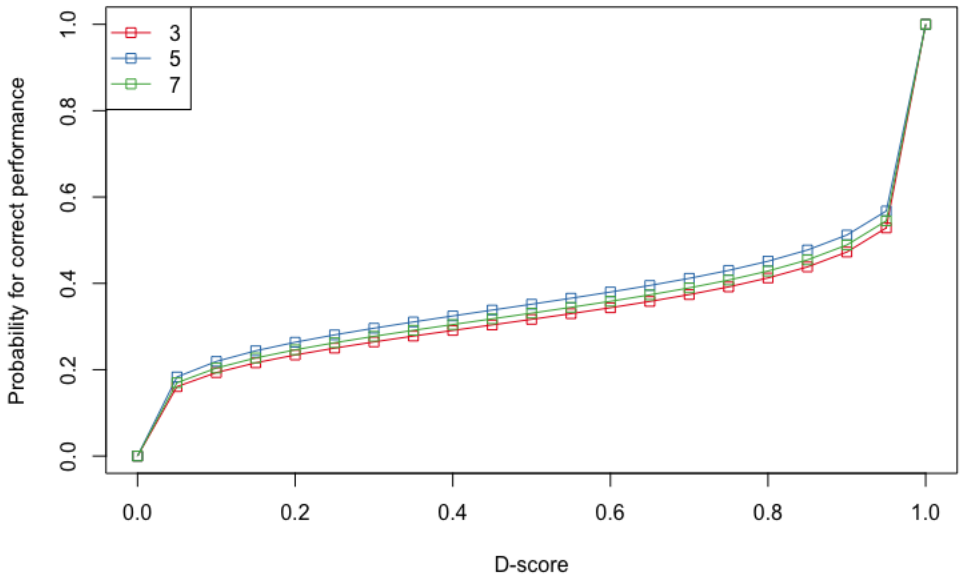
```
Fit<-dS.logitDeltaFit(itemData,Dscores)

Fit$parameters
Fit$pValues
Fit$SE
```

The default model is RFM2 with parameters b and s for the dificulty and shape of the ICC. If a diferent model is required, it can be changed trough the additional option parameter. For example, the following code fits the RFM3 model

```
o <- dS.options()
o$model <- 3
Fit<-dS.logitDeltaFit(itemData,Dscores,o)
```

The plot of the ICC can be generated by the code bellow, there the items 3,5,7 will be ploted in the same plot with a corresponding legend.

```
dS.logitDeltaPlot(Fit,items = c(3,5,7))
```



6 Equating

References

[1] Dimitrov, Dimiter. (2019). Modeling of Item Response Functions Under the D -Scoring Method. Educational and Psychological Measurement. 80. 001316441985417. 10.1177/0013164419854176.