

Homework assignment

L11: Computerized adaptive testing

Assignment date: 18.12.2018
Deadline: 28.12.2018 11:59
Slides: <http://www.cs.cas.cz/martinkova/NMST570>
Note: Send answers and R script to drabinova@cs.cas.cz
Name:

1 Reading

Ex. 1.1 Read article available at

<https://www.jstatsoft.org/article/view/v071i05>

and answer following questions:

1. What is the main purpose of computerized adaptive testing (CAT)? [0.25]
2. What is the main difference between CAT and fixed linear test? [0.25]
3. What is needed to be known a priori to implement CAT? [0.75]
4. Provide some examples of methods that can be used for estimation of ability θ . [0.25]
5. Explain why item selection in multidimensional CAT (MCAT) is usually more complicated than in unidimensional CAT. [0.5]
6. Provide at least two examples of termination criteria. [0.25]

2 Create CAT with mirtCAT

Download R script available at

http://www.cs.cas.cz/drabinova/documents/NMST570_HW10.R

Modify provided examples.

Ex. 2.1 Follow `Create simple non-adaptive interface`, modify it and create your own non-adaptive interface with at least 3 questions. You can use different types of responses. [1]

Ex. 2.2 Follow `Adding the demographics page`. Use your own non-adaptive interface from Ex. 2.1

1. add demographic page [0.25]
2. change title [0.25]
3. change authors [0.25]

HINT: use argument `shinyGUI`.

Ex. 2.3 Run Unidimensional CAT.

1. How many items did you answer until the stopping criteria were met? [0.25]
2. Which items were assigned? [0.25]
3. Which stopping criterion was met? [0.25]
4. What is your estimated ability θ ? What is its standard error? [0.5]

Ex. 2.4 Follow Offline example. Generate random response pattern for three levels of ability $\theta = -1, 0, 1$

1. How many items were assigned? [0.75]
2. Provide estimates of ability θ and their standard errors. Compare estimates with true values and briefly comment. [1.75]

Ex. 2.5 Run Multidimensional example with true addition ability 1 and true multiplication ability 0.5.

1. How many items were assigned using fixed linear testing and MCAT? [1]
2. Provide estimates of ability θ and their standard error using fixed linear testing and MCAT. Compare estimates with true values and briefly comment. [1.25]

3 Provide feedback

Here you can provide feedback on lecture, lab session and/or materials (slides, HW assignment, **ShinyItemAnalysis** manual) [1pt bonus] :)