

PSYC 948: Latent Trait Measurement and Structural Equation Models

Homework #1 (Total 10 Points)

Due: Wednesday, January 16, 2012 at 11:59pm

Homework Problems:

1. Email me and then link to the course information folder using Dropbox. (1 point)
2. Either let me know you have Mplus 7.0 already (by email) or sign up for a Holland Computing Center account for free Mplus access (1 point)

Using the following matrices, complete the next 10 questions. Please keep in mind that some questions may not have an answer. Use any method to compute these matrices, although it may be quickest to do by hand (.5 points each for a total of 5 points).

$$\mathbf{A} = \begin{bmatrix} 1 & 1 \\ 3 & 4 \\ 2 & 2 \end{bmatrix}, \mathbf{B} = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 3 \end{bmatrix}, \mathbf{C} = \begin{bmatrix} 1 & 1 & -1 \\ 0 & 1 & 2 \end{bmatrix}, \mathbf{j} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$$

1. $\mathbf{A} + \mathbf{C} =$
2. $\mathbf{A} + \mathbf{C}^T =$
3. $\mathbf{CA} =$
4. $\mathbf{AC} =$
5. $\mathbf{AC}^T =$
6. $\mathbf{C}^T \mathbf{A}^T =$
7. $\mathbf{j}^T \mathbf{j} =$
8. $\mathbf{jj}^T =$
9. $\mathbf{AC} - \mathbf{jj}^T =$
10. $\mathbf{CB} =$

Next, using data from a 12 item evaluation of faculty members given at a large university. You can download the data file from the course website and use Mplus.

11. Calculate a vector of means (the mean for each variable in the data set). (.5 points)
12. Calculate a covariance matrix for the data set. (.5 points)
13. Calculate the correlation matrix for the data set. (.5 points)
14. In one page or less, describe an existing psychometric data set of your own that you would like to use for each homework assignment. If you do not have a data set, please contact me to get one. (2.5 points)

Submission Instructions:

All homework and final answers must be your own and not be copied or paraphrased from anyone else's answers. Homework must be submitted via email (jtemplin@unl.edu) in the form of Microsoft Word document with the name: 948_FirstLast_HW#.docx. Late homework will have a penalty of 10% per calendar day.