Principal Component Analysis : Tutorial Sheet

1. What is Dimensionality Reduction
2. What is the KMO statistic? Describe how to interpret the KMO statistic.
3. What is the Bartlett Test of Sphericity used for?
4. varimax, quartimax and equamax are the commonly used methods in a certain procedure. What is this procedure? What is the purpose of the procedure. Which method is the most commonly used?
5. Describe how to use a Scree plot in the context of dimensionality reduction techniques.
6. What problems occur if a principal component analysis is done on a data matrix where the columns contain measurements on very difference scales? What can be done to overcome this problem?
7. Principal Component Analysis is a data reduction technique. Explain what this term means.
8. The KMO is used to measure what characteristic of the data. Explain how the KMO measure should be interpreted.
9. Briefly describe the Bartlett Test for Sphericity, with reference to the null and alternative hypotheses, and how those statements relate to the purpose of the test.
10. Discuss three techniques for determining the appropriate number of principal components.
11. In the context of principal components what is meant by orthogonality.
12. What is the purpose of a principal component analysis?
13. Explain the difference between PCA and factor analysis
14. Explain what is meant by the "true" dimension of the data? How does an analyst determine the appropriate number of factors to retain. Make reference to three difference techniques