Univeristy of Helsinki
Department of mathemathics and statistics

Exam Juni 2007

Examiner**:** prof. Tarkkonen

Subject**:** Statistics, Multivariate Analysis

OBSERVE! Answer four (4) questions. Return the questions.

1. Compare discriminant and regressionanalysis. The foundations of the methods and use. Give examples of the use of both methods.

2. Compare principal component and factor analysis. The foundations of the methods and use. Give examples of the use of both methods.ytöstä.

3. If **x** is divided into two parts: $\mathbf{x} = (x_1, x_2, ..., x_q, x_{q+1}, ..., x_p)' = (\mathbf{x}^{(1)}, \mathbf{x}^{(2)})'$

   The covariance matri cov(**x**) = Σ can be partitioned $cov(\mathbf{x}^{(1)}) = \Sigma_{11}$ and $cov(\mathbf{x}^{(2)}) = \Sigma_{22}$

   and $cov(\mathbf{x}^{(1)},\mathbf{x}^{(2)}) = \Sigma_{12}$ and $cov(\mathbf{x}^{(2)},\mathbf{x}^{(1)}) = \Sigma_{21}$

   a) Whenn $\Sigma_{12} = \mathbf{0}$ means the variables are independent. Why?

   b) If **y** is partitioned like x ánd $\mathbf{y}^{(1)} = \mathbf{x}^{(1)} - \Sigma_{12}\Sigma_{22}^{-1}\mathbf{x}^{(2)}$ and $\mathbf{y}^{(2)} = \mathbf{x}^{(2)}$,
   What can you say about the matrices $cov(\mathbf{y}^{(1)})$ and $cov(\mathbf{y}^{(1)},\mathbf{y}^{(2)})$?

4. The foundations of correspondence analysis. Where would you aply it?

Results by e-mail? ( )

My e-mail address:____