

Problems 13

Comments and hints are additional to those given in the book p. 623.

8.1 Use the hint in the text, not the hints in the outline solution.

8.2 $\underline{\theta}_1$ and $\underline{\theta}_2$ in the text should be renamed $\underline{\beta}_1$ and $\underline{\beta}_2$ to ensure consistency with the formulas in the book.

In the outline solution in the book delete \2.

Add to the text:

Determine also least squares estimates for $\underline{\theta}_1$, $\underline{\theta}_2$ and $\underline{\theta}_3$ (the expectation vectors)

8.3 Determine a confidence interval for $\underline{a}^T \underline{\mu}_0$, $\underline{\mu}_0 = \underline{B}^T \underline{x}_0$ as well as a prediction interval for $\underline{a}^T \underline{y}_0$, \underline{y}_0 being independent of earlier observations.

The interval which in the text and in the outline solution is called confidence interval should be renamed prediction interval.

Results:

$$\underline{a}^T \underline{\mu}_0 = \underline{a}^T \hat{\underline{y}}_0 \pm t_{1-\frac{\alpha}{2}}(n-p) \sqrt{\underline{x}_0^T (X^T X)^{-1} \underline{x}_0 \underline{a}^T S \underline{a}}$$

$$\underline{a}^T \underline{y}_0 = \underline{a}^T \hat{\underline{y}}_0 \pm t_{1-\frac{\alpha}{2}}(n-p) \sqrt{1 + \underline{x}_0^T (X^T X)^{-1} \underline{x}_0 \underline{a}^T S \underline{a}}$$

$$(\hat{\underline{y}}_0 = \hat{\underline{B}}^T \underline{x}_0)$$

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