Christian-Albrechts-Universität zu Kiel **Winter term 2015/16**
Mathematisches Seminar
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In-tutorial exercise sheet 3

supporting the lecture Mathematical Statistics

(Discussion in the tutorial on 18. November 2015)

Exercise 1.

Let $X \sim Bin(1, \vartheta)$ be a Bernoulli-distributed random variable. We investigate the estimator $g(X) = X$ for ϑ in $\Theta = (0, 1)$.

a) Check the assumptions for the Cramer-Rao-inequality 2.23.

b) Compute the Cramer-Rao-bound for g.

c) Is g efficient?

Hint: X has the density $f(k, \vartheta) = \vartheta^k(1-\vartheta)^{1-k}$ with respect to the measure $\mu = \delta_0 + \delta_1$, that places mass 1 in the points 0 and 1.