Christian-Albrechts-Universität zu Kiel **Winter term 2015/16**
Mathematisches Seminar
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In-tutorial exercise sheet 9

supporting the lecture Mathematical Statistics

(Discussion in the tutorial on 20. January 2015)

Exercise 1.

Let $X_1, \ldots, X_n$ be independend identically Bernoulli distributed $B(1,p)$ with unknown $p \in (0,1)$.

a) Derive an UMP test with level α for the simple hypotheses

$$H \ : \ p = p_0 \quad \text{against} \quad K \ : \ p = p_1$$

for given $p_0, p_1 \in (0,1)$ with $p_0 \neq p_1$.

b) Compute the power of the test at the point $p_1 = 0.75$ for the case $p_0 = 0.5$, $n = 100$, $\alpha = 0.05$. Apply an approximation by a normally distributed random variable via the central limit theorem.
Hint: The 95% quantile of the standard normal distribution is given by $u_{0.95} \approx 1.64$.

c) Which hypothisis against which alternative could also be tested with the test from part b)?