



Scientific Computing 2

Summer term 2017
Prof. Dr. Ira Neitzel
Christopher Kaewin



Sheet 8

Submission on **Thursday, 29.6.2017.**

Exercise 1. (constraint qualifications)

Review all constraint qualifications which were discussed in the lecture. State the CQ and briefly explain the context in which it is used. Point out the dependency structures and explain in a few words why a given CQ implies another CQ.

(6 points)

Exercise 2. (optimality conditions)

Review all optimality conditions which were discussed in the lecture. State the optimality condition and briefly explain the context. Decide for which cases the optimality condition is sufficient and/or necessary.

(6 points)

Exercise 3. (numerical treatment)

We consider a general finite-dimensional optimization problem

$$\min_{x \in \mathbb{R}^n} f(x)$$

with constraints

$$\begin{aligned} g_i(x) &\leq 0 \quad , \quad i = 1, \dots, m \\ h_j(x) &= 0 \quad , \quad j = 1, \dots, l \end{aligned}$$

with sufficiently smooth data. Review two numerical methods discussed in the lecture which can solve this problem. Explain which prerequisites have to be satisfied for the corresponding method.

(8 points)