

ENCE 724/BMGT 832
Nonlinear Programming
Spring 2005
Dr. Gabriel

Homework #6

Given out: March 4, 2005
Due at start of class: March 10, 2005

Note:

Homeworks will be collected at the start of the class and each week several students will be selected to present their homeworks to the class during the first 15 minutes. Five minutes (or less) will be devoted for each question.

Reading:

Chapter 4 Section: 4.4 (Second-Order Necessary and Sufficient Conditions for Optimality of Constrained Problems)
Chapter 5: (Constraint Qualifications)

Text Problems:

4.8, 5.10

Directional Derivatives-2

Consider the functions $f, g, h: D \subseteq \mathbb{R}^n \rightarrow \mathbb{R}$ where f, g are differentiable of a sufficient order and h is defined as follows: $h(x) = \min\{f(x), g(x)\}$.

Using the definition of a directional derivative, calculate $h'(x, d)$ for a typical point x where

- a. $f(x) < g(x)$
- b. $f(x) > g(x)$
- c. $f(x) = g(x)$

Support you answers with appropriate computations and/or results.