Modern Optimization Techniques - Exercise Sheet 11

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Solutions need to be handed in until Tuesday, February 2nd, 2016 at 10:15

Exercise 1: Cutting Plane Oracle (10P)

- a) Explain in your own words how the cutting plane oracle works!
- b) Explain in your own words what is difference between a neutral and a deep cut?
- c) Draw a seetch of the feasible set for the following minimization problem:

minimize
$$f(x_1, x_2) = x_1 + x_2$$

subject to
$$2x_1 - x_2 \le -1$$

$$-3x_1 - 2x_2 \ge -6$$

$$x_1 \ge 0$$

$$x_2 \ge 0$$

Where is the optimum and what is the value?

Exercise 2: Cutting Plane Methods (10P)

- a) Give one advantage and one disadvantage of the Center of gravity algorithm (CG-Algorithm).
- b) Draw a scetch of the feasible set for the following minimization problem:

minimize	$-4x_1+x_2$	
subject to	$7x_1 - 2x_2 \le 14$	(f_1)
	$x_2 \le 3$	(f_2)
	$2x_1 - 2x_2 \le 3$	(f_3)
	$x_1, x_2 \in \mathbb{Z}_+$	

use the subgradient of f_1 to find the cutting plane for the point $x_1 = x_2 = 2$ mark the part which is cut off