**The problem can be submitted until March 22, 12 :00 noon, either at the
exercise session or into the box in front of MA C1 563.**

Student(s) [1] :

Question 1 :   *The question is worth* 5 *points.*

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5   *Reserved for the corrector*

Let $P = \{x \in \mathbb{R}^n \mid Ax \leq b\}$ be a polyhedron. Two extreme points x_1, x_2 ($x_1 \neq x_2$) of P are
said to be *adjacent* if there exists a valid inequality $d^T x \leq \beta$ of P such that

$$P \cap \{x \in \mathbb{R}^n \mid d^T x = \beta\} = \{\lambda x_1 + (1 - \lambda)x_2 \mid \lambda \in [0, 1]\}$$

Show the following statement : Two different vertices v_1 and v_2 are adjacent, if and only if
there exist two bases $B_1, B_2 \subset \{1, \ldots, m\}$ such that $|B_1 \cap B_2| = n - 1$ and $v_1 = A_{B_1}^{-1} b_{B_1}$ as
well as $v_2 = A_{B_2}^{-1} b_{B_2}$ holds.

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1. You are allowed to submit your solutions in groups of at most three students.