

Solutions for exercises marked with a '*' will be made available online, usually in the following week. Only if needed will these exercises be discussed during the tutorial. All other exercises are to be prepared at home and presented by the participants during the tutorial session.

Exercise 8

8.1 Simplex Algorithm: Maximization

Consider the following **maximization** problem:

$$\begin{array}{ll}\text{max} & Z = 4X + 6Y \\ \text{subject to} & -X + Y \leq 11 \\ & X + Y \leq 27 \\ & 2X + 5Y \leq 90 \\ & X, Y \geq 0\end{array}$$

1. Find the maximum value Z .
2. At what values of A and B does the maximum occur?
3. State the basis variables in the maximum.
4. Draw on paper the linear constraints, mark the feasible region and indicate all basic feasible solutions (BFS) as well as the basis variables for each BFS.

8.2 Simplex Algorithm: Minimization*

Consider the following **minimization** problem:

$$\begin{array}{ll}\text{min} & Z = 3A + 2B \\ \text{subject to} & 2A + B \geq 6 \\ & A + B \geq 4 \\ & A, B \geq 0\end{array}$$

1. Find the minimum value Z .
2. At what values of A and B does the minimum occur?
3. State the basis variables in the minimum.
4. Draw on paper the linear constraints, mark the feasible region and indicate all basic feasible solutions (BFS) as well as the basis variables for each BFS.