Assignment 4

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Due: 4 March.

1   Simplex

- (*10 Points*) Solve any of the examples presented in class.

- (*40 Points*) Implement in Python the Simplex Method. Your goal is to solve problems of the form
  Find the Maximum (Minimum) value of

$$Z = a_1 x_1 + a_2 x_2 + a_3 x_3$$

  subject to the constraints

$$
\begin{aligned}
a_4 x_1 + a_5 x_2 + a_6 x_3 &\leq a_7 \\
a_8 x_1 + a_9 x_2 + a_{10} x_3 &\leq a_{11} \\
a_{12} x_1 + a_{13} x_2 + a_{14} x_3 &\leq a_{15}
\end{aligned}
$$

  where $x_i \geq 0$ for $i = 1, 2, 3$ and $a_k \in \mathbb{R}$ for $k = 1, \ldots 15$. The user gives the type of problem, i.e., minimization or maximization and the 15 constants in a separate file.