

The Simplex Method for Problems in Standard Form¹

1. **Introduce slack variables** to convert each constraint inequality into an equality.
2. **Rearrange the objective function** into an equation equal to 0.
3. **Enter the equations into the simplex tableau** (matrix).
 - Objective function in the bottom row.
 - Constants in the right column.
 - Label the columns with their variables.
 - Label the rows by their slack variables.
4. While there are negative values in the left part of the bottom row pivot the tableau according to these rules:
 - a) **Calculate the pivot column.** It is the column with the most negative entry in the left part of the bottom row.
 - b) **Calculate the pivot element.** Divide each element in the pivot column into the corresponding element in the last column. The pivot element is the one with the smallest non-negative quotient.
 - c) **Pivot** the tableau about this element to get a new tableau.
 - d) In the new tableau **relabel the pivot row** with the pivot column variable.
5. **When** all the values in left part of bottom row are positive, the solution can be read from the tableau.

¹ The fine print! What is standard form? There are three requirements of the problem formulation to be in standard form:

- i) The objective function must be being maximized.
- ii) All constraints must be $\leq$ ones.
- iii) All variables must be non-negative, i.e. ≥ 0 .