The Simplex Tableau

Sample problem:

$$\begin{aligned}
\text{maximize} \quad & z = 2\,x_1 + 3\,x_2 + 4\,x_3 \\
\text{subject to} \quad & 5\,x_1 + 6\,x_2 + 7\,x_3 \leq 8 \\
& 9\,x_1 + 10\,x_2 + 11\,x_3 \leq 12 \\
& x_1, x_2, x_3 \geq 0
\end{aligned}$$

With slack variables:

$$\begin{aligned}
\text{maximize} \quad & z = 2\,x_1 + 3\,x_2 + 4\,x_3 \\
\text{subject to} \quad & 5\,x_1 + 6\,x_2 + 7\,x_3 + s_1 = 8 \\
& 9\,x_1 + 10\,x_2 + 11\,x_3 + s_2 = 12 \\
& x_1, x_2, x_3, s_1, s_2 \geq 0
\end{aligned}$$

Tableau:

z	x_1	x_2	x_3	s_1	s_2	rhs		
1	-2	-3	-4	0	0	0	=	z
0	5	6	7	1	0	8	=	s_1
0	9	10	11	0	1	12	=	s_2

Optimal tableau:

z	x_1	x_2	x_3	s_1	s_2	rhs		
1	14/11	7/11	0	0	4/11	48/11	=	z
0	$-8/11$	$-4/11$	0	1	$-7/11$	4/11	=	s_1
0	9/11	10/11	1	0	1/11	12/11	=	x_3