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HW6: Simplex Algorithm

Hand Written Simplex Solution

1. Use simplex algorithm to solve the following LP.

$$\begin{aligned} \text{Max } z &= 5x_1 + x_2 \\ \text{s.t. } 2x_1 + x_2 &\leq 6 \\ x_1 - x_2 &\leq 0 \\ x_1, x_2 &\geq 0 \end{aligned}$$

Initial Table.

0 denotes pivot element

		x_1	x_2	s_1	s_2	R
0	s_1	2	1	1	0	6
0	s_2	①	-1	0	1	0
	Z	-5	-1	0	0	0

Iteration #1

		x_1	x_2	s_1	s_2	R
0	s_1	0	③	1	-2	6
5	x_1	1	-1	0	1	0
	Z	0	-6	0	5	0

Iteration #2

		x_1	x_2	s_1	s_2	R
1	x_2	0	1	1/3	-2/3	2
5	x_1	1	0	1/3	1/3	2
	Z	0	0	2	1	12

$z=12$ is optimal solution with $x_1=2$ and $x_2=2$.