Integer Problem:

Maximize $z = 9x_1 + 10x_2$
subject to

$$9x_1 + 11x_2 \;\leq\; 33$$

$$(x_1, x_2) \geq 0 \text{ in } \mathbb{Z}^2$$

Canonical Form:

Maximize $z = 9x_1 + 10x_2$
subject to

$$9x_1 + 11x_2 + u_1 \ = \ 33$$

$$(x_1, x_2, u_1) \geq 0 \text{ in } \mathbb{Z}^3$$

	x_1	x_2	u_1	
u_1	9	11	1	33
	-9	-10	0	0

	x_1	x_2	u_1	
u_1	9	11	1	33
	-9	-10	0	0

	x_1	x_2	u_1	
← u_1	9	11	1	33
	-9	-10	0	0

x_1	x_2	u_1	
1	11/9	1/9	11/3
-9	-10	0	0

	x_1	x_2	u_1	
x_1	1	11/9	1/9	11/3
	0	1	1	33

	x_1	x_2	u_1	
x_1	1	11/9	1/9	11/3
	0	1	1	33

Optimal solution in $\mathbb{R}^2$: $(x_1, x_2) = (\frac{11}{3}, 0)$

	x_1	x_2	u_1	
x_1	1	11/9	1/9	11/3
	0	1	1	33

$$x_1 + \frac{11}{9}x_2 + \frac{1}{9}u_1 \;=\; \frac{11}{3} \quad \text{and} \quad (x_1, x_2, u_1) \geq 0 \text{ in } \mathbb{Z}^3$$

$$x_1 + x_2 \leq 3$$

	x_1	x_2	u_1	u_2	
x_1	1	11/9	1/9	0	11/3
u_2	1	1	0	1	3
	0	1	1	0	33

	x_1	x_2	u_1	u_2	
x_1	1	11/9	1/9	0	11/3
u_2	1	1	0	1	3
	0	1	1	0	33

	x_1	x_2	u_1	u_2	
x_1	1	11/9	1/9	0	11/3
u_2	0	-2/9	-1/9	1	-2/3
	0	1	1	0	33

	x_1	x_2	u_1	u_2	
x_1	1	11/9	1/9	0	11/3
← u_2	0	-2/9	-1/9	1	-2/3
	0	1	1	0	33

	x_1	x_2	u_1	u_2	
x_1	1	11/9	1/9	0	11/3
u_2	0	-2/9	-1/9	1	-2/3
	0	1	1	0	33

	x_1	x_2	u_1	u_2	
x_1	1	11/9	1/9	0	11/3
←	0	1	1/2	-9/2	3
	0	1	1	0	33

	x_1	x_2	u_1	u_2	
x_1	1	0	-1/2	11/2	0
x_2	0	1	1/2	-9/2	3
	0	0	1/2	9/2	30

	x_1	x_2	u_1	u_2	
x_1	1	0	-1/2	11/2	0
x_2	0	1	1/2	-9/2	3
	0	0	1/2	9/2	30

Optimal solution in $\mathbb{Z}^2$: $(x_1, x_2) = (0, 3)$