Possible Glitches in the Simplex Solution:
What if there is a tie in the entering basic variable?
What if there is a tie for the leaving basic variable?
What if there is no leaving basic variable?
What if there are multiple optimal solutions?

Iteration	Basic Var	Coeff						RHS
		Z	x_1	x_2	x_3	x_4	x_5	
0	Z	1	–30	**–20**	0	0	0	**0**
	x_3	0	1	0	1	0	0	4
	x_4	0	0	2	0	1	0	12
	x_5	0	3	2	0	0	1	18
1	Z	1						
	x	0						
	x	0						
	x	0						
2	Z	1						
	x	0						
	x	0						
	x	0						
3	Z	1						
	x	0						
	x	0						
	x	0						

Variations in Model Forms I: (artificial variables and the Big *M* method)

Constraints to be satisfied at equality.

$$\begin{aligned} \text{Max} \quad & Z = 30x_1 + 15x_2 \\ \text{s.t.} \quad & x_1 \quad \square \ 4 \\ & 2x_2 \ \square \ 12 \\ & 3x_1 + 2x_2 = 18 \\ & x_1 \geq 0, x_2 \geq 0 \end{aligned}$$

Iteration	Basic Var	Coeff						RHS
		Z	x_1	x_2	x_3	x_4	x_5	
	Z	1			0	0		
	x_3	0	1	0	1	0	0	4
	x_4	0	0	2	0	1	0	12
	x_5	0	3	2	0	0	1	18
0	Z	1						
	x	0	1	0	1	0	0	4
	x	0	0	2	0	1	0	12
	x	0	3	2	0	0	1	18
1	Z	1						
	x	0						
	x	0						
	x	0						
2	Z	1						
	x	0						
	x	0						
	x	0						

Variations in Model Forms II: Negative RHS.

Variations in Model Forms III: (surplus variable)

Data for Quidditch Game problem

	Fraction of Contact Force		
	Absorbed by Area (average)		**Restriction on Total**
Area	**(Fred) 1**	**2 (George)**	**Sustainable Contact**
1 (spectators' stand)	0.4	0.5	minimize
2 (announcer's stand)	0.3	0.1	□ 2.7
3 (opposing player)	0.5	0.5	= 6
4 (bludger)	0.6	0.4	≥ 6

Constraints with opposite inequality signs.

Variations in Model Forms IV: Minimization problems.

Iteration	Basic Var	Coeff							RHS
		Z	**x_1**	**x_2**	**x_3**	**x_4**	**x_5**	**x_6**	
	Z	–1	**0.4**	**0.5**	0	**M**	0	**M**	**0**
	x_3	0	0.3	0.1	1	0	0	0	2.7
	x_4	0	0.5	0.5	0	1	0	0	6
	x_6	0	0.6	0.4	0	0	–1	1	6
0	Z	–1							
	X_3	0	0.3	0.1	1	0	0	0	2.7
	x_4	0	0.5	0.5	0	1	0	0	6
	x_6	0	0.6	0.4	0	0	–1	1	6
1	Z	–1							
	x	0							
	x	0							
	x	0							
2	Z	–1							
	x	0							
	x	0							
	x	0							
3	Z	–1							
	x	0							
	x	0							
	x	0							