Problem

Write a program to solve an LPP using simplex method. Display each iteration in a tabular form. Assume that the optimal solution exists. It is a maximization problem and all equations are $\leq$ type. Your program should check all these facts if a wrong type input is given.

Example: Maximize $x_1 + x_2 + 3x_3$

Subject to $3x_1 + 2x_2 + x_3 \leq 3$

$2x_1 + x_2 + 2x_3 \leq 2$

$x_1, x_2, x_3 \geq 0$

Input:

3 2

1 1 3

3 2 1 leq 3

2 1 2 leq 2

Output:

			c_j	1	1	3	0	0		
C_B	B	X_B	b	a_1	a_2	a_3	a_4	a_5	Min Ratio	Operations
0	a_4	x_4	3	3	2	1	1	0	3	
0	a_5	x_5	2	2	1	2	0	1	1	
$Z_j - c_j$			0	-1	-1	-3	0	0		
0	a_4	x_4	2	2	$\frac{3}{2}$	0	1	$-\frac{1}{2}$		$R_1' = R_1 - R_2'$
3	a_3	x_3	1	1	$\frac{1}{2}$	1	0	$\frac{1}{2}$		$R_2' = \frac{R_2}{2}$
$Z_j - c_j$			3	2	$\frac{1}{2}$	0	0	$\frac{3}{2}$		

The optimum solution is:

$x_1 = 0$, $x_2 = 0$, $x_3 = 1$, and $Z = 3$