

$$\min_{x_1, x_2} \quad f = -2x_1 - x_2 \quad \leftarrow \text{cost function}$$

$$\left. \begin{aligned} x_1 + \frac{8}{3}x_2 &\leq 4 \\ x_1 + x_2 &\leq 2 \\ 2x_1 &\leq 3 \\ x_1 &\geq 0 \\ x_2 &\geq 0 \end{aligned} \right\} \leftarrow \text{constraints}$$

Step 1:

$$\max_{x_1, x_2} \quad f = 2x_1 + x_2$$

$$x_1 + \frac{8}{3}x_2 \leq 4$$

$$x_1 + x_2 \leq 2$$

$$2x_1 \leq 3$$

$$x_1 \geq 0$$

$$x_2 \geq 0$$

Step 2:

$$2x_1 + x_2$$

$$x_1 + \frac{8}{3}x_2 + \Delta_1 = 4$$

$$x_1 + x_2 + \Delta_2 = 2$$

$$2x_1 + \Delta_3 = 3$$

Step 3:

Step 4:

	$C_0$	$x_1$	$x_2$	$\Delta_1$	$\Delta_2$	$\Delta_3$	RHS	initial basic feasible solution
$\Delta_1$		1	$\frac{8}{3}$	1	0	0	$4/1 = 4$	$(x_1, x_2, \Delta_1, \Delta_2, \Delta_3) = (0, 0, 4, 2, 3)$
$\Delta_2$		1	1	0	1	0	$2/1 = 2$	
$\Delta_3$		2	0	0	0	1	$3/2 = 1.5$	
BFS $\leftarrow$		$-2$	$-1$	0	0	0	0	$\Delta_3$ : exiting var $x_1$ : entering var

step 5:

step 6:	2	1	0	0	0	RHS	New BFS:
	$x_1$	$x_2$	$\Delta_1$	$\Delta_2$	$\Delta_3$		
exit var	0	8/3	1	0	-1/2	4/3	$(x_1, x_2, \Delta_1, \Delta_2, \Delta_3)$
new BFS	$\Delta_2$	0	1	0	-1/2	2/1 = 2	$(\frac{3}{2}, 0, 4, 2, 0)$
	$x_1$	1	0	0	1/2	3/2/0 = 3/2	
	0	(-1)	0	0	1	3	

$$R_{\Delta_1} \rightarrow R_{\Delta_1} - \frac{R_{\Delta_3}}{2}$$

$$R_{\Delta_2} \rightarrow R_{\Delta_2} - \frac{R_{\Delta_3}}{2}$$

$$R_4 \rightarrow R_4 + R_{\Delta_3}$$

$x_2$ : entering Var

step 7

	$x_1$	$x_2$	$\Delta_1$	$\Delta_2$	$\Delta_3$	RHS
$x_2$	0	1	3/8	0	-3/16	3/2
$\Delta_2$	0	0	-3/8	1	-5/16	1/2
$x_1$	1	0	0	0	1/2	3/2
	0	0	3/8	0	13/16	9/2

$$R_{x_2} \rightarrow R_{\Delta_1} \div \frac{8}{3}$$

$$R_{\Delta_2} \rightarrow R_{\Delta_2} - \frac{3}{8} R_{\Delta_1}$$

$$R_{x_1} \rightarrow R_{x_1}$$

$$R_4 \rightarrow R_4 + \frac{3}{8} R_{\Delta_1}$$

$$(x_1, x_2, \Delta_1, \Delta_2, \Delta_3) = (\frac{3}{2}, \frac{3}{2}, 0, \frac{1}{2}, 0)$$

$$\text{optimal value} = \frac{9}{2}$$