

Example 2: Cycling (Exercise 3, p. 172)

	x_1	x_2	x_3	x_4	s_1	s_2	RHS
	-2	-3	1	12	0	0	0
s_1	-2	-9	1	9	1	0	0
s_2	1/3	1	-1/3	-2	0	1	0

Pivot on the (2,2) entry bringing x_2 into the set of BV. Note that this original solution is (0,0,0,0)

	x_1	x_2	x_3	x_4	s_1	s_2	RHS
	-1	0	0	6	0	3	0
s_1	1	0	-2	-9	1	9	0
x_2	1/3	1	-1/3	-2	0	1	0

The BFS is now (0,0,0,0). Bring in x_1

	x_1	x_2	x_3	x_4	s_1	s_2	RHS
	0	0	-2	-3	1	12	0
x_1	1	0	-2	-9	1	9	0
x_2	0	1	1/3	1	-1/3	-2	0

The BFS is still (0,0,0,0) even after pivoting. Bring in x_4 :

	x_1	x_2	x_3	x_4	s_1	s_2	RHS
	0	3	-1	0	0	6	0
x_1	1	9	1	0	-2	-9	0
x_4	0	1	1/3	1	-1/3	-2	0

Now bring in x_3 :

	x_1	x_2	x_3	x_4	s_1	s_2	RHS
	1	12	0	0	-2	-3	0
x_3	1	9	1	0	-2	-9	0
x_4	-1/3	-2	0	1	1/3	1	0

Continuing, now s_2 comes back in:

	x_1	x_2	x_3	x_4	s_1	s_2	RHS
	0	6	0	3	-1	0	0
x_3	-2	-9	1	9	1	0	0
s_2	-1/3	-2	0	1	1/3	1	0

And finally s_1 comes back in:

	x_1	x_2	x_3	x_4	s_1	s_2	RHS
	-2	-3	1	12	0	0	0
s_1	-2	-9	1	9	1	0	0
s_2	1/3	1	-1/3	-2	0	1	0

And we're back where we started!

Example 3(b): A Closer Look at Degeneracy

	x_1	x_2	s_1	s_2	s_3	s_4	s_5	s_6	
	-3	-4	0	0	0	0	0	0	0
s_1	-2	1	1	0	0	0	0	0	2
s_2	2	-1	0	1	0	0	0	0	4
s_3	1	0	0	0	1	0	0	0	3
s_4	0	1	0	0	0	1	0	0	4
s_5	-1	1	0	0	0	0	1	0	3
s_6	1	1	0	0	0	0	0	1	7

\Rightarrow Vertex (non-degen): $(0, 0)$
 $\mathbf{s} = [2, 4, 3, 4, 3, 7]^T$

	x_1	x_2	s_1	s_2	s_3	s_4	s_5	s_6	
	-11	0	4	0	0	0	0	0	8
x_2	-2	1	1	0	0	0	0	0	2
s_2	0	0	1	1	0	0	0	0	6
s_3	1	0	0	0	1	0	0	0	3
s_4	2	0	-1	0	0	1	0	0	2
s_5	1	0	-1	0	0	0	1	0	1
s_6	3	0	-1	0	0	0	0	1	5

\Rightarrow Vertex (non-degen): $(0, 2)$
 $\mathbf{s} = [0, 6, 3, 2, 1, 5]^T$

	x_1	x_2	s_1	s_2	s_3	s_4	s_5	s_6	
	0	0	-7	0	0	0	11	0	19
x_2	0	1	-1	0	0	0	2	0	4
s_2	0	0	1	1	0	0	0	0	6
s_3	0	0	1	0	1	0	-1	0	2
s_4	0	0	1	0	0	1	-2	0	0
x_1	1	0	-1	0	0	0	1	0	1
s_6	0	0	2	0	0	0	3	1	2

\Rightarrow Vertex (degen): $(1, 4)$
 $\mathbf{s} = [0, 6, 2, 0^*, 0, 2]^T$

	x_1	x_2	s_1	s_2	s_3	s_4	s_5	s_6	
	0	0	0	0	0	7	-3	0	19
x_2	0	1	0	0	0	1	0	0	4
s_2	0	0	0	1	0	-1	2	0	6
s_3	0	0	0	0	1	-1	1	0	2
s_1	0	0	1	0	0	1	-2	0	0
x_1	1	0	0	0	0	1	-1	0	1
s_6	0	0	0	0	0	-2	1	1	2

\Rightarrow Vertex (degen): $(1, 4)$
 $\mathbf{s} = [0^*, 6, 2, 0, 0, 2]^T$

	x_1	x_2	s_1	s_2	s_3	s_4	s_5	s_6	
	0	0	0	0	0	1	0	3	25
x_2	0	1	0	0	0	1	0	0	4
s_2	0	0	0	1	0	3	0	-2	2
s_3	0	0	0	0	1	1	0	-1	0
s_1	0	0	1	0	0	-3	0	2	4
x_1	1	0	0	0	0	-1	0	1	3
s_5	0	0	0	0	0	-2	1	1	2

\Rightarrow Vertex (degen): $(3, 4)$
 $\mathbf{s} = [4, 2, 0^*, 0, 2, 0]^T$

