

Cycling in the Simplex method. Example 3-5-2 on page 68 of the textbook.

Initial Tableau (Note it is degenerate)

	x1	x2	x3	x4	1
y1	-0.5	5.5	2.5	-9	0
y2	-0.5	1.5	0.5	-1	0
y3	-1	0	0	0	1
f	-10	57	9	24	0

1st Jordan exchange

	y1	x2	x3	x4	1
x1	-2	11	5	-18	0
y2	1	-4	-2	8	0
y3	2	-11	-5	18	1
f	20	-53	-41	204	0

2nd Jordan exchange

	y1	y2	x3	x4	1
x1	0.75	-2.75	-0.5	4	0
x2	0.25	-0.25	-0.5	2	0
y3	-0.75	2.75	0.5	-4	1
f	6.75	13.25	-14.5	98	0

3rd Jordan exchange

	y1	y2	x1	x4	1
x3	1.5	-5.5	-2	8	0
x2	-0.5	2.5	1	-2	0
y3	0	0	-1	0	1
f	-15	93	29	-18	0

4th Jordan exchange

	y1	y2	x1	x2	1
x3	-0.5	4.5	2	-4	0
x4	-0.25	1.25	0.5	-0.5	0
y3	0	0	-1	0	1
f	-10.5	70.5	20	9	0

5th Jordan exchange

	x3	y2	x1	x2	1
y1	-2	9	4	-8	0
x4	0.5	-1	-0.5	1.5	0
y3	0	0	-1	0	1
f	21	-24	-22	93	0

6th Jordan exchange (**Back to the initial tableau!!!**)

	x3	x4	x1	x2	1
y1	2.5	-9	-0.5	5.5	0
y2	0.5	-1	-0.5	1.5	0
y3	0	0	-1	0	1
f	9	24	-10	57	0

Using the Bland's rule (smallest-subscript rule)

After the 5th Jordan exchange, the pivot is different.

	x3	y2	x1	x2	1
y1	-2	9	4	-8	0
x4	0.5	-1	-0.5	1.5	0
y3	0	0	-1	0	1
f	21	-24	-22	93	0

Jordan exchange

	x3	y2	x4	x2	1
y1	2	1	-8	4	0
x1	1	-2	-2	3	0
y3	-1	2	2	-3	1
f	-1	20	44	27	0

Jordan exchange (**Optimal solution!**)

	y3	y2	x4	x2	1
y1	-2	5	-4	-2	2
x1	-1	0	0	0	1
x3	-1	2	2	-3	1
f	1	18	42	30	-1