

p1.txt:

```
3 2
3 5
1 0 -1 4
0 2 -1 6
3 2 -1 18
```

p1 output:

Original problem

z	x1	x2	s1	s2	s3	rhs	basis
1.00	-3.00	-5.00	0.00	0.00	0.00	0.00	z
0.00	1.00	0.00	1.00	0.00	0.00	4.00	s1
0.00	0.00	2.00	0.00	1.00	0.00	6.00	s2
0.00	3.00	2.00	0.00	0.00	1.00	18.00	s3

x2 enters the basis and s2 leaves

z	x1	x2	s1	s2	s3	rhs	basis
1.00	-3.00	0.00	0.00	2.50	0.00	15.00	z
0.00	1.00	0.00	1.00	0.00	0.00	4.00	s1
0.00	0.00	1.00	0.00	0.50	0.00	3.00	x2
0.00	3.00	0.00	0.00	-1.00	1.00	12.00	s3

x1 enters the basis and s1 leaves

z	x1	x2	s1	s2	s3	rhs	basis
1.00	0.00	0.00	3.00	2.50	0.00	27.00	z
0.00	1.00	0.00	1.00	0.00	0.00	4.00	x1
0.00	0.00	1.00	0.00	0.50	0.00	3.00	x2
0.00	0.00	0.00	-3.00	-1.00	1.00	0.00	s3

Solution is optimal

z = 27.00

x = (4.00, 3.00)

p2.txt:

```
3 2
3 5
1 0 -1 4
0 2 -1 6
3 2 1 18
```

p2 output:

Original problem

z	x1	x2	s1	s2	e3	rhs	basis
1.00	-3.00	-5.00	0.00	0.00	0.00	0.00	z
0.00	1.00	0.00	1.00	0.00	0.00	4.00	s1
0.00	0.00	2.00	0.00	1.00	0.00	6.00	s2
0.00	3.00	2.00	0.00	0.00	-1.00	18.00	

Add a3 and pivot

z	x1	x2	s1	s2	e3	a3	rhs	basis
0.00	-3.00	-2.00	0.00	0.00	1.00	0.00	-18.00	M
1.00	-3.00	-5.00	0.00	0.00	0.00	0.00	0.00	z
0.00	1.00	0.00	1.00	0.00	0.00	0.00	4.00	s1
0.00	0.00	2.00	0.00	1.00	0.00	0.00	6.00	s2
0.00	3.00	2.00	0.00	0.00	-1.00	1.00	18.00	a3

x1 enters the basis and s1 leaves

z	x1	x2	s1	s2	e3	a3	rhs	basis
0.00	0.00	-2.00	3.00	0.00	1.00	0.00	-6.00	M
1.00	0.00	-5.00	3.00	0.00	0.00	0.00	12.00	z
0.00	1.00	0.00	1.00	0.00	0.00	0.00	4.00	x1
0.00	0.00	2.00	0.00	1.00	0.00	0.00	6.00	s2
0.00	0.00	2.00	-3.00	0.00	-1.00	1.00	6.00	a3

x2 enters the basis and s2 leaves

z	x1	x2	s1	s2	e3	a3	rhs	basis
0.00	0.00	0.00	3.00	1.00	1.00	0.00	0.00	M
1.00	0.00	0.00	3.00	2.50	0.00	0.00	27.00	z
0.00	1.00	0.00	1.00	0.00	0.00	0.00	4.00	x1
0.00	0.00	1.00	0.00	0.50	0.00	0.00	3.00	x2
0.00	0.00	0.00	-3.00	-1.00	-1.00	1.00	0.00	a3

Solution is optimal (alternative optimal solutions exist)

z = 27.00

x = (4.00, 3.00)

p3.txt:

```
3 2
-4 -4
3 1 0 3
4 3 1 6
1 2 -1 3
```

p3 output:

Original problem

z	x1	x2	e2	s3	rhs	basis
1.00	4.00	4.00	0.00	0.00	0.00	z
0.00	3.00	1.00	0.00	0.00	3.00	
0.00	4.00	3.00	-1.00	0.00	6.00	
0.00	1.00	2.00	0.00	1.00	3.00	s3

Add a1 and pivot

z	x1	x2	e2	s3	a1	rhs	basis
0.00	-3.00	-1.00	0.00	0.00	0.00	-3.00	M
1.00	4.00	4.00	0.00	0.00	0.00	0.00	z
0.00	3.00	1.00	0.00	0.00	1.00	3.00	a1
0.00	4.00	3.00	-1.00	0.00	0.00	6.00	
0.00	1.00	2.00	0.00	1.00	0.00	3.00	s3

Add a2 and pivot

z	x1	x2	e2	s3	a1	a2	rhs	basis
0.00	-7.00	-4.00	1.00	0.00	0.00	0.00	-9.00	M
1.00	4.00	4.00	0.00	0.00	0.00	0.00	0.00	z
0.00	3.00	1.00	0.00	0.00	1.00	0.00	3.00	a1
0.00	4.00	3.00	-1.00	0.00	0.00	1.00	6.00	a2
0.00	1.00	2.00	0.00	1.00	0.00	0.00	3.00	s3

x1 enters the basis and a1 leaves

z	x1	x2	e2	s3	a1	a2	rhs	basis
0.00	0.00	-1.67	1.00	0.00	2.33	0.00	-2.00	M
1.00	0.00	2.67	0.00	0.00	-1.33	0.00	-4.00	z
0.00	1.00	0.33	0.00	0.00	0.33	0.00	1.00	x1
0.00	0.00	1.67	-1.00	0.00	-1.33	1.00	2.00	a2
0.00	0.00	1.67	0.00	1.00	-0.33	0.00	2.00	s3

x2 enters the basis and a2 leaves

z	x1	x2	e2	s3	a1	a2	rhs	basis
0.00	0.00	0.00	0.00	0.00	1.00	1.00	0.00	M
1.00	0.00	0.00	1.60	0.00	0.80	-1.60	-7.20	z
0.00	1.00	0.00	0.20	0.00	0.60	-0.20	0.60	x1
0.00	0.00	1.00	-0.60	0.00	-0.80	0.60	1.20	x2
0.00	0.00	0.00	1.00	1.00	1.00	-1.00	0.00	s3

Solution is optimal

z = -7.20

x = (0.60, 1.20)

p4.txt:

```
3 2
3 2
-1 2 -1 4
3 2 -1 14
1 -1 -1 3
```

p4 output:

Original problem

z	x1	x2	s1	s2	s3	rhs	basis
1.00	-3.00	-2.00	0.00	0.00	0.00	0.00	z
0.00	-1.00	2.00	1.00	0.00	0.00	4.00	s1
0.00	3.00	2.00	0.00	1.00	0.00	14.00	s2
0.00	1.00	-1.00	0.00	0.00	1.00	3.00	s3

x1 enters the basis and s3 leaves

z	x1	x2	s1	s2	s3	rhs	basis
1.00	0.00	-5.00	0.00	0.00	3.00	9.00	z
0.00	0.00	1.00	1.00	0.00	1.00	7.00	s1
0.00	0.00	5.00	0.00	1.00	-3.00	5.00	s2
0.00	1.00	-1.00	0.00	0.00	1.00	3.00	x1

x2 enters the basis and s2 leaves

z	x1	x2	s1	s2	s3	rhs	basis
1.00	0.00	0.00	0.00	1.00	0.00	14.00	z
0.00	0.00	0.00	1.00	-0.20	1.60	6.00	s1
0.00	0.00	1.00	0.00	0.20	-0.60	1.00	x2
0.00	1.00	0.00	0.00	0.20	0.40	4.00	x1

Solution is optimal (alternative optimal exists)

z = 14.00

x = (4.00, 1.00)

p5.txt:

```
2 2
2 3
1 -1 -1 2
-3 1 -1 4
```

p5 output:

Original problem

z	x1	x2	s1	s2	rhs	basis
1.00	-2.00	-3.00	0.00	0.00	0.00	z
0.00	1.00	-1.00	1.00	0.00	2.00	s1
0.00	-3.00	1.00	0.00	1.00	4.00	s2

x2 enters the basis and s2 leaves

z	x1	x2	s1	s2	rhs	basis
1.00	-11.00	0.00	0.00	3.00	12.00	z
0.00	-2.00	0.00	1.00	1.00	6.00	s1
0.00	-3.00	1.00	0.00	1.00	4.00	x2

Unbounded problem

p6.txt:

```
3 2
3 5
1 0 -1 4
0 2 -1 6
3 2 1 20
```

p6 output:

Original problem

z	x1	x2	s1	s2	e3	rhs	basis
1.00	-3.00	-5.00	0.00	0.00	0.00	0.00	z
0.00	1.00	0.00	1.00	0.00	0.00	4.00	s1
0.00	0.00	2.00	0.00	1.00	0.00	6.00	s2
0.00	3.00	2.00	0.00	0.00	-1.00	20.00	

Add a3 and pivot

z	x1	x2	s1	s2	e3	a3	rhs	basis
0.00	-3.00	-2.00	0.00	0.00	1.00	0.00	-20.00	M
1.00	-3.00	-5.00	0.00	0.00	0.00	0.00	0.00	z
0.00	1.00	0.00	1.00	0.00	0.00	0.00	4.00	s1
0.00	0.00	2.00	0.00	1.00	0.00	0.00	6.00	s2
0.00	3.00	2.00	0.00	0.00	-1.00	1.00	20.00	a3

x1 enters the basis and s1 leaves

z	x1	x2	s1	s2	e3	a3	rhs	basis
0.00	0.00	-2.00	3.00	0.00	1.00	0.00	-8.00	M
1.00	0.00	-5.00	3.00	0.00	0.00	0.00	12.00	z
0.00	1.00	0.00	1.00	0.00	0.00	0.00	4.00	x1
0.00	0.00	2.00	0.00	1.00	0.00	0.00	6.00	s2
0.00	0.00	2.00	-3.00	0.00	-1.00	1.00	8.00	a3

x2 enters the basis and s2 leaves

z	x1	x2	s1	s2	e3	a3	rhs	basis
0.00	0.00	0.00	3.00	1.00	1.00	0.00	-2.00	M
1.00	0.00	0.00	3.00	2.50	0.00	0.00	27.00	z
0.00	1.00	0.00	1.00	0.00	0.00	0.00	4.00	x1
0.00	0.00	1.00	0.00	0.50	0.00	0.00	3.00	x2
0.00	0.00	0.00	-3.00	-1.00	-1.00	1.00	2.00	a3

Infeasible problem