```
with(simplex) :
P := {x5 = -0.5 x1 + 5.5 x2 + 2.5 x3 - 9 x4, x6 = -0.5 x1 + 1.5 x2 + 0.5 x3 - x4, x7 = 1
     - x1} :
f := 10 x1 - 57 x2 - 9 x3 - 24 x4 :
print(`maximalizuj   f` = f); print(`za podmienok`); for e in P0 do e; end do;
     print(`x1,...,x7` ≥ 0);
```

$$\text{maximalizuj} \quad f = 10\,x1 - 57\,x2 - 9\,x3 - 24\,x4$$

$$\text{za podmienok}$$

$$x5 = -0.5\,x1 + 5.5\,x2 + 2.5\,x3 - 9\,x4$$

$$x6 = -0.5\,x1 + 1.5\,x2 + 0.5\,x3 - x4$$

$$x7 = 1 - x1$$

$$0 \leq x1,\ldots,x7 \tag{1}$$

```
P0 := P:
f0 := subs(P0, f) :
for e in P0 do e; end do; print('`-------------------------`'); z = f0;
```

$$x5 = -0.5\,x1 + 5.5\,x2 + 2.5\,x3 - 9\,x4$$

$$x6 = -0.5\,x1 + 1.5\,x2 + 0.5\,x3 - x4$$

$$x7 = 1 - x1$$

$$z = 10\,x1 - 57\,x2 - 9\,x3 - 24\,x4 \tag{2}$$

Pivotovacie pravidlo "najväčší koeficient" vyberie do bázy x1, Blandovo pravidlo tiež.
Urobíme teda pivotovací krok s x1, z bázy vystúpi x5:

```
P1 := pivot(P0, x1, pivoteqn(P0, x1)) :
f1 := subs(P1, f0) :
for e in P1 do e; end do; print('`-------------------------`'); z = f1;
```

$$x1 = -2\,x5 + 11\,x2 + 5\,x3 - 18\,x4$$

$$x6 = 1\,x5 - 4\,x2 - 2\,x3 + 8\,x4$$

$$x7 = 1 + 2\,x5 - 11\,x2 - 5\,x3 + 18\,x4$$

$$z = -20\,x5 + 53\,x2 + 41\,x3 - 204\,x4 \tag{3}$$

Najväčší koeficient: x2
Blandovo pravidlo: x2

```
P2 := pivot(P1, x2, pivoteqn(P1, x2)) :
f2 := subs(P2, f1) :
for e in P2 do e; end do; print('`-------------------------`'); z = f2;
```

$$x1 = 0.75\,x5 - 2.75\,x6 - 0.50\,x3 + 4.00\,x4$$

$$x2 = -0.25\,x6 + 0.25\,x5 - 0.50\,x3 + 2.00\,x4$$

$$x7 = 1.00 - 0.75\,x5 + 2.75\,x6 + 0.50\,x3 - 4.00\,x4$$

$$z = -6.75\,x5 - 13.25\,x6 + 14.50\,x3 - 98.00\,x4 \tag{4}$$

Najväčší koeficient: x3
Blandovo pravidlo: x3
$P3 := pivot(P2, x3, pivoteqn(P2, x3))$:
$f3 := subs(P3, f2)$:
for e **in** P3 **do** e; **end do**; print('`-------------------------`'); $z = f3$;

$$x2 = 2.5\, x6 - 0.5\, x5 + 1.0\, x1 - 2.0\, x4$$

$$x3 = -2.0\, x1 + 1.5\, x5 - 5.5\, x6 + 8.0\, x4$$

$$x7 = 1.0 - 1.0\, x1$$

$$z = 15.0\, x5 - 93.0\, x6 - 29.0\, x1 + 18.0\, x4 \tag{5}$$

Najväčší koeficient: x4
Blandovo pravidlo: x4
$P4 := pivot(P3, x4, pivoteqn(P3, x4))$:
$f4 := subs(P4, f3)$:
for e **in** P4 **do** e; **end do**; print('`-------------------------`'); $z = f4$;

$$x3 = 2.00\, x1 - 0.50\, x5 + 4.50\, x6 - 4.00\, x2$$

$$x4 = -0.50\, x2 + 1.25\, x6 - 0.25\, x5 + 0.50\, x1$$

$$x7 = 1.00 - 1.00\, x1$$

$$z = 10.50\, x5 - 70.50\, x6 - 20.00\, x1 - 9.00\, x2 \tag{6}$$

Najväčší koeficient: x5
Blandovo pravidlo: x5
$P5 := pivot(P4, x5, pivoteqn(P4, x5))$:
$f5 := subs(P5, f4)$:
for e **in** P5 **do** e; **end do**; print('`-------------------------`'); $z = f5$;

$$x4 = 1.5\, x2 - 1.0\, x6 + 0.5\, x3 - 0.5\, x1$$

$$x5 = -2.0\, x3 + 4.0\, x1 + 9.0\, x6 - 8.0\, x2$$

$$x7 = 1.0 - 1.0\, x1$$

$$z = -21.0\, x3 + 22.0\, x1 + 24.0\, x6 - 93.0\, x2 \tag{7}$$

Najväčší koeficient má x6, Blandovo pravidlo by vybralo x1, keďže má najmenší index.
Teraz budeme pokračovať podľa pivotovacieho pravidla "najväčší koeficient",
k Blandovemu pravidlu sa vratime neskôr.
$P6 := pivot(P5, x6, pivoteqn(P5, x6))$:
$f6 := subs(P6, f5)$:
for e **in** P6 **do** e; **end do**; print('`-------------------------`'); $z = f6$;

$$x5 = 2.5\, x3 - 0.5\, x1 - 9.0\, x4 + 5.5\, x2$$

$$x6 = -1.0\, x4 + 1.5\, x2 + 0.5\, x3 - 0.5\, x1$$

$$x7 = 1.0 - 1.0\, x1$$

$$z = -9.0\, x3 + 10.0\, x1 - 24.0\, x4 - 57.0\, x2 \tag{8}$$

$P7 := pivot(P6, x1, pivoteqn(P6, x1))$:
$f7 := subs(P7, f6)$:
for e **in** P7 **do** e; **end do**; print('`-------------------------`'); $z = f7$;

$$x1 = -2\, x5 + 11\, x2 + 5\, x3 - 18\, x4$$

$$x6 = 8\, x4 - 4\, x2 - 2\, x3 + 1\, x5$$

$$x7 = 1 + 2\, x5 - 11\, x2 - 5\, x3 + 18\, x4$$

$$z = 41\, x3 - 20\, x5 + 53\, x2 - 204\, x4 \tag{9}$$

Keď si však vypíšeme tabuľku v kroku 1, zistíme, že je rovnaká:
for e **in** P1 **do** e; **end do**; print('`-------------------------`'); $z = f1$;

$$x1 = -2\, x5 + 11\, x2 + 5\, x3 - 18\, x4$$

$$x6 = 1\, x5 - 4\, x2 - 2\, x3 + 8\, x4$$

$$x7 = 1 + 2\, x5 - 11\, x2 - 5\, x3 + 18\, x4$$

$$z = -20\, x5 + 53\, x2 + 41\, x3 - 204\, x4 \tag{10}$$

Algoritmus sa dostal do rovnakého stavu, v akom bol v kroku 0. Keďže je deterministický,
znamená to, že sa zacyklil.

Teraz sa skúsime vrátiť do kroku 6, kde miesto pravidla "najväčší koeficient" použijeme Blandovo pravidlo (teda pivotovací krok spravíme s x1 miesto x6):
$P6b := pivot(P5, x1, pivoteqn(P5, x1))$:
$f6b := subs(P6, f5)$:
for e **in** P6b **do** e; **end do**; print('`-------------------------`'); $z = f6b$;

$$x1 = -2\, x4 + 3\, x2 - 2\, x6 + x3$$

$$x5 = 2\, x3 - 8\, x4 + 4\, x2 + 1\, x6$$

$$x7 = 1 + 2\, x4 - 3\, x2 + 2\, x6 - 1\, x3$$

$$z = -9\, x3 + 10\, x1 - 24\, x4 - 57\, x2 \tag{11}$$

$P7b := pivot(P6b, x3, pivoteqn(P6b, x3))$:
$f7b := subs(P7b, f6b)$:
for e **in** P7b **do** e; **end do**; print('`-------------------------`'); $z = f7b$;

$$x1 = 1 - 1\, x7$$

$$x3 = -1\, x7 + 1 + 2\, x4 - 3\, x2 + 2\, x6$$

$$x5 = -2\, x7 + 2 - 4\, x4 - 2\, x2 + 5\, x6$$

$$z = -1\, x7 + 1 - 42\, x4 - 30\, x2 - 18\, x6 \tag{12}$$

Konečne nám stúpla účelová funkcia na 1 a vidíme, že všetky premenné v z majú záporné koeficienty, takže sme dosiahli optimum.