Zadanie1Lab6

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```
%typeset_mode True

A=([1,2,-3],[1,8,-4],[2,-3,-7])
b=(3,8,9)
c=(3,2,-7)
P=InteractiveLPProblemStandardForm(A,b,c,["x1","x2","x3"])
view(P)
D=P.initial_dictionary()
view(D)
```

$$\begin{aligned} \max\ & 3x_1 + 2x_2 - 7x_3 \\ & x_1 + 2x_2 - 3x_3 \leq 3 \\ & x_1 + 8x_2 - 4x_3 \leq 8 \\ & 2x_1 - 3x_2 - 7x_3 \leq 9 \\ & x_1, x_2, x_3 \geq 0 \end{aligned}$$

$$\begin{array}{|r|} \hline x_4 = 3 - x_1 - 2x_2 + 3x_3 \\ x_5 = 8 - x_1 - 8x_2 + 4x_3 \\ x_6 = 9 - 2x_1 + 3x_2 + 7x_3 \\ \hline z = 0 + 3x_1 + 2x_2 - 7x_3 \\ \hline \end{array}$$

```
print "D jest dopuszczalne: "+ str(D.is_feasible())
print "D jest optymalne: " + str(D.is_optimal())
```

D jest dopuszczalne: True
D jest optymalne: False

```
print D.possible_entering()
```

[x1, x2]

```
D.enter("x1")
```

```
print D.possible_leaving()
```

[x4]

```
D.leave("x4")
```

```
D.update()
```

```
view(D)
```

$$\begin{array}{|l|}\hline x_1 = 3 - x_4 - 2x_2 + 3x_3 \\ x_5 = 5 + x_4 - 6x_2 + x_3 \\ x_6 = 3 + 2x_4 + 7x_2 + x_3 \\ \hline z = 9 - 3x_4 - 4x_2 + 2x_3 \\ \hline \end{array}$$

```
print D.possible_entering()
```

[x3]

```
D.enter("x3")
```

```
D.possible_leaving()
```

[]

```
P.run_simplex_method()
```

$$\begin{array}{|l|}\hline x_4 = 3 - x_1 - 2x_2 + 3x_3 \\ x_5 = 8 - x_1 - 8x_2 + 4x_3 \\ x_6 = 9 - 2x_1 + 3x_2 + 7x_3 \\ \hline z = 0 + 3x_1 + 2x_2 - 7x_3 \\ \hline \end{array}$$

Entering: x_1. Leaving: x_4.

$$\begin{array}{|l|}\hline x_1 = 3 - x_4 - 2x_2 + 3x_3 \\ x_5 = 5 + x_4 - 6x_2 + x_3 \\ x_6 = 3 + 2x_4 + 7x_2 + x_3 \\ \hline z = 9 - 3x_4 - 4x_2 + 2x_3 \\ \hline \end{array}$$

The problem is unbounded in x_3 direction.