1

$$(PPL)_g \begin{cases} (1_g)\ (\min) f(x_1,x_2,x_3) = -2x_1 + 2x_2 - x_3 \\ (2_g) \begin{cases} 2x_1 + x_2 + x_3 \leq 4 \\ x_1 - x_2 + x_3 = 3 \\ 2x_1 + 2x_2 - x_3 \leq 5 \end{cases} \\ (3_g)\ x_1, x_2, x_3 \geq 0 \end{cases}$$

" $\leq$ " $\Longrightarrow$ " + "

" $\geq$ " $\Longrightarrow$ " − "

$$(PPL)_s \begin{cases} (1_s)\ (\min) f(x_1,x_2,x_3,x_4^c,x_5^c) = -2x_1 + 2x_2 - x_3 + 0\cdot x_4^c + 0\cdot x_5^c \\ (2_s) \begin{cases} 2x_1 + x_2 + x_3 + x_4^c = 4 \\ x_1 - x_2 + x_3 = 3 \\ 2x_1 + 2x_2 - x_3 + x_5^c = 5 \end{cases} \\ (3_s)\ x_1, x_2, x_3, x_4^c, x_5^c \geq 0 \end{cases} \xrightarrow[SBAi]{\overline{X_0} = ?}$$

$$\Longrightarrow \overline{A} = \begin{array}{c} \begin{array}{cccccc} P_1 & P_2 & P_3 & P_4^c & P_5^c & P_0 \end{array} \\ \left(\begin{array}{ccccc|c} 2 & 1 & 1 & 1 & 0 & 4 \\ 1 & -1 & \boxed{1} & 0 & 0 & 3 \\ 2 & 2 & -1 & 0 & 1 & 5 \end{array}\right) \end{array} /\cdot(-1) /\cdot 1 \sim$$

$$\sim \begin{array}{c} \begin{array}{cccccc} P_1 & P_2 & P_3 & P_4^c & P_5^c & P_0 \end{array} \\ \left(\begin{array}{ccccc|c} 1 & 2 & 0 & 1 & 0 & 1 \\ 1 & -1 & 1 & 0 & 0 & 3 \\ 3 & 1 & 0 & 0 & 1 & 8 \end{array}\right) \end{array} \sim \begin{array}{c} \begin{array}{cccccc} P_1 & P_2 & P_3 & P_4^c & P_5^c & P_0 \end{array} \\ \left(\begin{array}{ccccc|c} 1 & -1 & 1 & 0 & 0 & 3 \\ 1 & 2 & 0 & 1 & 0 & 1 \\ 3 & 1 & 0 & 0 & 1 & 8 \end{array}\right) \end{array} \equiv \overline{A}^R_{G\text{-}J}$$

v.s = 0   v.p.

$$\Longrightarrow \overline{X_0} = (0, 0, 3, 1, 8)^T - \text{S.B.A } i \quad (\text{S.B.A. ndd})$$

$\geq 0 \ \geq 0 \ \geq 0$

$\neq 0 \ \neq 0 \ \neq 0$

		$(1_5) \to$	-2	2	-1	0	0	
B	C_B	P_0	P_1	P_2	P_3	P_4^c	P_5^c	$\theta_i = \frac{P_0}{P_j} > 0$
P_3	-1	3	1	-1	1	0	0	$\frac{P_0}{P_1}$: $\frac{3}{1} = 3$
P_4^c	0	1	$\boxed{1}$	2	0	1	0	$\frac{1}{1} = 1$ $\cdot(-1)$ $\cdot(-3)$
P_5^c	0	8	3	1	0	0	1	$\frac{8}{3}$
		$f(\overline{X_0}) = -3$	$\underline{1}$	-1	0	0	0	$z_j - c_j$
			z_1-c_1	z_2-c_2	z_3-c_3	z_4-c_4	z_5-c_5	
P_3	-1	2	0	-3	1	-1	0	
P_1	-2	1	1	2	0	1	0	
P_5^c	0	5	0	-5	0	-3	1	
		$f(\overline{X_1}) = -4$	0	-3	0	-1	0	$z_j - c_j$
			z_1-c_1	z_2-c_2	z_3-c_3	z_4-c_4	z_5-c_5	

$$\begin{cases} \overline{X_0} = (0,0,3,1,8)^T \\ f(\overline{X_0}) = -3 \end{cases}$$

$$\Rightarrow \begin{cases} \overline{X_1} = (1,0,2,0,5)^T \\ f(\overline{X_1}) = -4 \end{cases}$$

T_1:
$$\begin{cases}
f(\overline{X_0}) = \sum C_B \cdot P_0 = -1\cdot 3 + 0\cdot 1 + 0\cdot 8 = -3 \\
z_1 - c_1 = \sum C_B \cdot P_1 - c_1 = (-1\cdot 1 + 0\cdot 1 + 0\cdot 3) - (-2) = -1 + 2 = 1 \\
z_2 - c_2 = \sum C_B \cdot P_2 - c_2 = (-1\cdot(-1) + 0\cdot 2 + 0\cdot 1) - 2 = 1 - 2 = -1 \\
z_3 - c_3 = \sum C_B \cdot P_3 - c_3 = (-1\cdot 1 + 0\cdot 0 + 0\cdot 0) - (-1) = -1 + 1 = 0 \\
z_4 - c_4 = \sum C_B \cdot P_4 - c_4 = (-1\cdot 0 + 0\cdot 1 + 0\cdot 0) - 0 = 0 - 0 = 0 \\
z_5 - c_5 = \sum C_B \cdot P_5 - c_5 \; (-1\cdot 0 + 0\cdot 0 + 0\cdot 1) - 0 = 0 - 0 = 0
\end{cases}$$

T_2:
$$\begin{cases}
f(\overline{X_1}) = \sum C_B \cdot P_0 = -1\cdot 2 + (-2)\cdot 1 + 0\cdot 5 = -4 \\
z_1 - c_1 = \sum C_B \cdot P_1 - c_1 = (-1\cdot 0 + (-2)\cdot 1 + 0\cdot 0) - (-2) = -2 + 2 = 0 \\
z_2 - c_2 = \sum C_B \cdot P_2 - c_2 = (-1\cdot(-3) + (-2)\cdot 2 + 0\cdot(-5)) - 2 = -1 - 2 = -3 \\
z_3 - c_3 = \sum C_B \cdot P_3 - c_3 = (-1\cdot 1 + (-2)\cdot 0 + 0\cdot 0) - (-1) = -1 + 1 = 0 \\
z_4 - c_4 = \sum C_B \cdot P_4 - c_4 = (-1\cdot(-1) + (-2)\cdot 1 + 0\cdot(-3)) - 0 = -1 - 0 = -1 \\
z_5 - c_5 = \sum C_B \cdot P_5 - c_5 = (-1\cdot 0 + (-2)\cdot 0 + 0\cdot 1) - 0 = 0 - 0 = 0
\end{cases}$$

Concluzia pt $(PPL)_s$:

$$\begin{cases} X_{optim}^{standard} = (1,0,2,0,5)^T \text{ soluție optimă și unică} \\ (\min) f = -4 \end{cases}$$

Concluzia pt $(PPL)_g$:

$$\begin{cases} X_{optim}^{inițială} = (1,0,2)^T \text{ soluție optimă și unică} \\ (\min) f = -4 \end{cases}$$

$$(PPL)_g \begin{cases} (1g) \ (\max) f(x_1,x_2,x_3) = -2x_1+2x_2-x_3 \\ (2g) \begin{cases} x_1+x_2+2x_3 \le 6 \\ x_1+x_2-x_3 \le 4 \end{cases} \\ (3g) \ x_1,x_2,x_3 \ge 0 \end{cases}$$

$X_0 \rightsquigarrow P_4^c, P_5^c$

$$\begin{cases} X_{optim}^{standard} = \left(0, \frac{14}{3}, \frac{2}{3}, 0, 0\right)^T \text{ sol. optimă și unică} \\ \min(-f) = -\frac{26}{3} \end{cases}$$

$$\begin{cases} X_{optim}^{inițială} = \left(0, \frac{14}{3}, \frac{2}{3}\right)^T \text{ sol. optimă și unică} \\ \max f = \frac{26}{3} \end{cases}$$

② $(PPL)_g$

(1g) $\min f(x_1,x_2,x_3) = 3x_1 - x_2 + 2x_3$

(2g) $\begin{cases} x_1 - x_2 + 2x_3 \le 14 \\ x_1 + x_3 = 6 \\ 2x_1 + 2x_2 - x_3 \le 10 \end{cases}$

(3g) $x_1, x_2, x_3 \ge 0$

„$\le$" $\Rightarrow$ „+"

„$\ge$" $\Rightarrow$ „−"

$(PPL)_s$

(1s) $\min f(x_1,x_2,x_3,x_4^c,x_5^c) = 3x_1 - x_2 + 2x_3 + 0\cdot x_4^c + 0\cdot x_5^c$

(2s) $\begin{cases} x_1 - x_2 + 2x_3 + x_4^c = 14 \\ x_1 + x_3 = 6 \\ 2x_1 + 2x_2 - x_3 + x_5^c = 10 \end{cases}$

(3s) $x_1, x_2, x_3, x_4^c, x_5^c \ge 0$

$\overline{X_0} = ? \xrightarrow[\text{SBA i}]{}$!!!

$$\Rightarrow \overline{A} = \begin{array}{c} \begin{array}{cccccc} P_1 & P_2 & P_3 & P_4^c & P_5^c & P_0 \end{array} \\ \left(\begin{array}{ccccc|c} 1 & -1 & 2 & 1 & 0 & 14 \\ 1 & 0 & \boxed{1} & 0 & 0 & 6 \\ 2 & 2 & -1 & 0 & 1 & 10 \end{array}\right) \\ \begin{array}{ccccc} x_1 & x_2 & x_3 & x_4^c & x_5^c \end{array} \end{array} \begin{array}{l} + \\ /\cdot(-2) /\cdot 1 \\ + \end{array} \sim$$

$$\sim \begin{array}{c} \begin{array}{cccccc} P_1 & P_2 & P_3 & P_4^c & P_5^c & P_0 \end{array} \\ \left(\begin{array}{ccccc|c} -1 & -1 & 0 & 1 & 0 & 2 \\ 1 & 0 & 1 & 0 & 0 & 6 \\ 3 & 2 & 0 & 0 & 1 & 16 \end{array}\right) \end{array} \sim \begin{array}{c} \begin{array}{cccccc} P_1 & P_2 & P_3 & P_4^c & P_5^c & P_0 \end{array} \\ \left(\begin{array}{ccccc|c} 1 & 0 & 1 & 0 & 0 & 6 \\ -1 & -1 & 0 & 1 & 0 & 2 \\ 3 & 2 & 0 & 0 & 1 & 16 \end{array}\right) \end{array} \equiv \overline{A}^R_{G-J} \Longrightarrow$$

v.s=0 v.p v.s=0 v.p.

$$\Longrightarrow \overline{X_0} = (0,0,6,2,16)^T - \text{S.B.A i } (\text{S.B.A Nd.})$$

$\ge 0 \ge 0 \ge 0$

$\ne 0 \ne 0 \ne 0$

		(1s) ⟶	3	-1	2	0	0	
B	C_B	P_0	P_1	P_2	P_3	P_4^c	P_5^c	$\theta_i = \frac{P_0}{P_j} > 0$
P_3	2	6	1	0	1	0	0	$\frac{P_0}{P_2}$: $\frac{6}{0} = ?!$
P_4^c	0	2	-1	-1	0	1	0	$\frac{2}{-1} = ?!$
P_5^c	0	16	3	$\boxed{2}$	0	0	1	$\frac{16}{2} = 8$ / $\cdot\frac{1}{2}$ / $\cdot\frac{1}{2}$
		$f(\overline{X_0}) = 12$	-1	1	0	0	0	$z_j - c_j$
			z_1-c_1	z_2-c_2	z_3-c_3	z_4-c_4	z_5-c_5	
P_3	2	6	1	0	1	0	0	
P_4^c	0	10	$\frac{1}{2}$	0	0	1	$\frac{1}{2}$	
P_2	-1	8	$\frac{3}{2}$	1	0	0	$\frac{1}{2}$	
		$f(\overline{X_1}) = 4$	$-\frac{5}{2}$	0	0	0	$-\frac{1}{2}$	$z_j - c_j$
			z_1-c_1	z_2-c_2	z_3-c_3	z_4-c_4	z_5-c_5	

$\Rightarrow \begin{cases} \overline{X_0} = (0,0,6,2,16)^T \\ f(\overline{X_0}) = 12 \end{cases}$

$\Rightarrow \begin{cases} \overline{X_1} = (0,8,6,10,0)^T \\ f(\overline{X_1}) = 4 \end{cases}$

Cl pt $(PPL)_S$: $\begin{cases} X_{optim}^{standard} = (0,8,6,10,0)^T \\ (min) f = 4 \end{cases}$ soluție optimă și unică $\Rightarrow$ Cl. pt $(PPL)_g$ $\begin{cases} X_{optim}^{inițială} = (0,8,6)^T \\ (min) f = 4 \end{cases}$ sol. optimă unică

T_1: $\begin{cases} f(\overline{X_0}) = \sum c_B \cdot P_0 = 2\cdot6+0\cdot2+0\cdot6 = 12 \\ z_1 - c_1 = \sum c_B \cdot P_1 - c_1 = (2\cdot1+0\cdot(-1)+0\cdot3) - 3 = 2-3 = -1 \\ z_2 - c_2 = \sum c_B \cdot P_2 - c_2 = (2\cdot0+0\cdot(-1)+0\cdot2) - (-1) = 0+1 = 1 \\ z_3 - c_3 = \sum c_B \cdot P_3 - c_3 = (2\cdot1+0\cdot0+0\cdot0) - 2 = 2-2 = 0 \\ z_4 - c_4 = \sum c_B \cdot P_4 - c_4 = (2\cdot0+0\cdot1+0\cdot0) - 0 = 0-0 = 0 \\ z_5 - c_5 = \sum c_B \cdot P_5 - c_5 = (2\cdot0+0\cdot0+0\cdot1) - 0 = 0-0 = 0 \end{cases}$

T_2: $\begin{cases} f(\overline{X_1}) = \sum c_B \cdot P_0 = 2\cdot6+0\cdot10+(-1)\cdot8 = 4 \\ z_1 - c_1 = \sum c_B \cdot P_1 - c_1 = (2\cdot1+0\cdot\frac{1}{2}+(-1)\cdot\frac{3}{2}) - 3 = \frac{1}{2} - 3 = -\frac{5}{2} \\ z_2 - c_2 = \sum c_B \cdot P_2 - c_2 = (2\cdot0+0\cdot0+(-1)\cdot1) - (-1) = -1+1 = 0 \\ z_3 - c_3 = \sum c_B \cdot P_3 - c_3 = (2\cdot1+0\cdot0+(-1)\cdot0) - 2 = 2-2 = 0 \\ z_4 - c_4 = \sum c_B \cdot P_4 - c_4 = (2\cdot0+0\cdot1+(-1)\cdot0) - 0 = 0-0 = 0 \\ z_5 - c_5 = \sum c_B \cdot P_5 - c_5 = (2\cdot0+0\cdot\frac{1}{2}+(-1)\cdot\frac{1}{2}) - 0 = -\frac{1}{2} \end{cases}$

3

$$(PPL)_g \begin{cases} (1g)\ \max f(x_1,x_2,x_3) = -2x_1+2x_2-x_3 \\ (2g) \begin{cases} x_1+x_2+2x_3 \le 6 \\ x_1+x_2-x_3 \le 4 \end{cases} \\ (3g)\ x_1,x_2,x_3 \ge 0 \end{cases}$$

$$\boxed{\max f = -\min(-f)}$$

$$(PPL)_s \begin{cases} (1s)\ \min(-f)(x_1,x_2,x_3,x_4^c,x_5^c) = 2x_1-2x_2+x_3+0\cdot x_4^c+0\cdot x_5^c \\ (2s) \begin{cases} x_1+x_2+2x_3+x_4^c = 6 \\ x_1+x_2-x_3+x_5^c = 4 \end{cases} \\ (3s)\ x_1,x_2,x_3,x_4^c,x_5^c \ge 0 \end{cases}$$

$$\overline{x_0} = ? \xrightarrow[S.B.A.i]{} \quad \overline{A} = \begin{array}{c} \begin{array}{cccccc} P_1 & P_2 & P_3 & P_4^c & P_5^c & P_0 \end{array} \\ \left(\begin{array}{ccccc|c} 1 & 1 & 2 & 1 & 0 & 6 \\ 1 & 1 & -1 & 0 & 1 & 4 \end{array}\right) \end{array} = \overline{A}^R_{G-J}$$

v.s = 0   v.p.

$$\Rightarrow \overline{x_0} = (0,0,0,6,4)^T - S.B.A.i.$$

		(1s) →	2	−2	1	0	0	
B	C_B	P_0	P_1	P_2 ↓	P_3 ↓	P_4^c	P_5^c	$\theta_i = \frac{P_0}{P_j \downarrow} > 0$
P_4^c	0	6	1	1	2	1	0	$\frac{P_0}{P_2\downarrow}$ $\frac{6}{1}=6$ ← +
← P_5^c	0	4	1	$\boxed{1}$	−1	0	1	$\frac{4}{1}=4$ / $\cdot(-1)$
		$(-f)(\overline{x_0})=0$	−2	2	−1	0	0	$z_j - c_j$
← P_4^c	0	2	0	0	$\boxed{3}$	1	−1	$\frac{P_0}{P_3\downarrow}$ $\frac{2}{3}$ / $\cdot\frac{1}{3}$ / $\cdot\frac{1}{3}$
P_2	−2	4	1	1	−1	0	1	$\frac{4}{-1}=?!$ ← +
		$(-f)(\overline{x_1})=-8$	−4	0	1	0	−2	$z_j - c_j$
P_3	1	$\frac{2}{3}$	0	0	1	$\frac{1}{3}$	$-\frac{1}{3}$	
P_2	−2	$\frac{14}{3}$	1	1	0	$\frac{1}{3}$	$\frac{2}{3}$	
		$(-f)(\overline{x_2})=-\frac{26}{3}$	−4	0	0	$-\frac{1}{3}$	$-\frac{5}{3}$	$z_j - c_j$

$$\Rightarrow \begin{cases} \overline{x_0} = (0,0,0,6,4)^T \\ (-f)(\overline{x_0}) = 0 \end{cases}$$

$$\Rightarrow \begin{cases} \overline{x_1} = (0,4,0,2,0)^T \\ (-f)(\overline{x_1}) = -8 \end{cases}$$

$$\Rightarrow \begin{cases} \overline{x_2} = \left(0,\frac{14}{3},\frac{2}{3},0,0\right)^T \\ (-f)(\overline{x_2}) = -\frac{26}{3} \end{cases}$$

Cl. pt $(PPL)_S$: $\begin{cases} X_{optim}^{standard} = \left(0, \frac{14}{3}, \frac{2}{3}, 0, 0\right)^T \text{ S.O. unică} \\ \min(f) = -\frac{26}{3} \end{cases}$

$$\boxed{\text{Cl. pt } (PPL)_{gi} : \begin{cases} X_{optim}^{inițial} = \left(0, \frac{14}{3}, \frac{2}{3}\right)^T \text{ S.O. unică.} \\ \max f = \frac{26}{3} \end{cases}}$$

4

$$(PPL)_g \begin{cases} (1g)\ \min f(x_1,x_2,x_3,x_4) = 2x_1 + x_2 - x_3 + 6x_4 \\ (2g) \begin{cases} 2x_1 + x_2 - x_3 \le 8 \\ x_2 + 2x_3 - x_4 \le 4 \\ x_1 + x_2 - x_3 + 2x_4 = 2 \end{cases} \\ (3g)\ x_1, x_2, x_3, x_4 \ge 0 \end{cases}$$

„$\le$" $\Rightarrow$ „$+$"

„$\ge$" $\Rightarrow$ „$-$"

$$(PPL)_s \begin{cases} (1s)\ \min f(x_1,x_2,x_3,x_4,x_5^c,x_6^c) = 2x_1 + x_2 - x_3 + 6x_4 + 0\cdot x_5^c + 0\cdot x_6^c \\ (2s) \begin{cases} 2x_1 + x_2 - x_3 + x_5^c = 8 \\ x_2 + 2x_3 - x_4 + x_6^c = 4 \\ x_1 + x_2 - x_3 + 2x_4 = 2 \end{cases} \xrightarrow[\text{SBA.i}]{\overline{X}_0 = ?} \\ (3s)\ x_1, x_2, x_3, x_4, x_5^c, x_6^c \ge 0 \end{cases}$$

v.s $= 0$

$$\Rightarrow \overline{A} = \begin{array}{c} \begin{matrix} P_1 & P_2 & P_3 & P_4 & P_5^c & P_6^c & P_0 \end{matrix} \\ \left(\begin{array}{cccccc|c} 2 & 1 & -1 & 0 & 1 & 0 & 8 \\ 0 & 1 & 2 & -1 & 0 & 1 & 4 \\ \boxed{1} & 1 & -1 & 2 & 0 & 0 & 2 \end{array}\right) \end{array} \cdot(-2) \sim \begin{array}{c} \begin{matrix} P_1 & P_2 & P_3 & P_4 & P_5^c & P_6^c & P_0 \end{matrix} \\ \left(\begin{array}{cccccc|c} 0 & -1 & 1 & -4 & 1 & 0 & 4 \\ 0 & 1 & 2 & -1 & 0 & 1 & 4 \\ 1 & 1 & -1 & 2 & 0 & 0 & 2 \end{array}\right) \end{array}$$

$$\Rightarrow \overline{X}_0 = (2,0,0,0,4,4)^T - \text{S.B.A.i} \quad (\text{SBA Nol})$$

v.P.

$\ge 0 \quad \ge 0 \ \ge 0$

$\ne 0 \quad \ne 0 \ \ne 0$

		(1s) →	2	1	-1	6	0	0	
B	C_B	P_0	P_1	P_2 ↓	P_3	P_4	P_5^c	P_6^c	$\theta_i = \frac{P_0}{P_j \downarrow} > 0$
P_5^c	0	4	0	-1	1	-4	1	0	$\frac{P_0}{P_2 \downarrow}$: $\frac{4}{-1} = ?!$
P_6^c	0	4	0	1	2	-1	0	1	$\frac{4}{1} = 4$
← P_1	2	2	1	$\boxed{1}$	-1	2	0	0	$\frac{2}{1} = 2$ / ·(-1) / ·1
		$f(X_0) = 4$	0	1	-1	-2	0	0	
			z_1-c_1	z_2-c_2	z_3-c_3	z_4-c_4	z_5-c_5	z_6-c_6	$z_j - c_j$
P_5^c	0	6	1	0	0	-2	1	0	
P_6^c	0	2	-1	0	3	-3	0	1	
P_2	1	2	1	1	-1	2	0	0	
		$f(X_1) = 2$	-1	$\underline{0}$	0	-4	$\underline{0}$	$\underline{0}$	$z_j - c_j$

$\Rightarrow \begin{cases} X_0 = (2,0,0,0,4,4)^T \\ f(X_0) = 4 \end{cases}$

$\Rightarrow \begin{cases} X_1 = (0,2,0,0,6,2)^T \\ f(X_1) = 2 \end{cases}$

$$T_1 : \begin{cases} f(X_0) = \sum C_B \cdot P_0 = 0\cdot 4 + 0 \cdot 4 + 2 \cdot 2 = 4 \\ z_1 - c_1 = \sum C_B \cdot P_1 - c_1 = (0\cdot 0 + 0 \cdot 0 + 2 \cdot 1) - 2 = 2 - 2 = 0 \\ z_2 - c_2 = \sum C_B \cdot P_2 - c_2 = (0\cdot(-1) + 0\cdot 1 + 2\cdot 1) - 1 = 2 - 1 = 1 \\ z_3 - c_3 = \sum C_B \cdot P_3 - c_3 = (0\cdot 1 + 0 \cdot 2 + 2\cdot(-1)) - (-1) = -2 + 1 = -1 \\ z_4 - c_4 = \sum C_B \cdot P_4 - c_4 = (0\cdot(-4) + 0\cdot(-1) + 2\cdot 2) - 6 = 4 - 6 = -2 \\ z_5 - c_5 = \sum C_B \cdot P_5 - c_5 = (0 \cdot 1 + 0 \cdot 0 + 2 \cdot 0) - 0 = 0 - 0 = 0 \\ z_6 - c_6 = \sum C_B \cdot P_6 - c_6 = (0\cdot 0 + 0 \cdot 1 + 2 \cdot 0) - 0 = 0 - 0 = 0 \end{cases}$$

Cl. pt. $(PPL)_S$: $\begin{cases} X_{optim}^{standard} = (0,2,0,0,6,2)^T \\ (min) f = 2 \end{cases}$ soluție optimă dar nu unică

Cl. pt. $(PPL)_g$: $\begin{cases} X_{optim}^{initial} = (0,2,0,0)^T \\ (min) f = 2 \end{cases}$ soluție optimă, dar nu unică

5

$$(PPL)_g \begin{cases} (1g)\ \max f(x_1,x_2,x_3,x_4) = -3x_1 - x_3 + x_4 \\ (2g)\ \begin{cases} x_1 + 2x_2 + x_4 \le 2 \\ x_1 + x_2 - x_3 + 2x_4 \le 6 \end{cases} \\ (3g)\ x_1, x_2, x_3, x_4 \ge 0 \end{cases}$$

$$\boxed{\max f = -\min(-f)}$$

$$(PPL)_s \begin{cases} (1s)\ \min(-f)(x_1,x_2,x_3,x_4,x_5^c,x_6^c) = +3x_1 + x_3 - x_4 + 0\cdot x_5^c + 0\cdot x_6^c \\ (2s)\ \begin{cases} x_1 + 2x_2 + x_4 + x_5^c = 2 \\ x_1 + x_2 - x_3 + 2x_4 + x_6^c = 6 \end{cases} \xrightarrow[\text{SBAi}]{\overline{X_0} = ?} \\ (3s)\ x_1, x_2, x_3, x_4, x_5^c, x_6^c \ge 0 \end{cases}$$

$$\Rightarrow \overline{A} = \begin{array}{c} \begin{array}{ccccccc} P_1 & P_2 & P_3 & P_4 & P_5^c & P_6^c & P_0 \end{array} \\ \left(\begin{array}{cccccc|c} 1 & 2 & 0 & 1 & 1 & 0 & 2 \\ 1 & 1 & -1 & 2 & 0 & 1 & 6 \end{array}\right) \end{array} \equiv A_{G-J} \Rightarrow \overline{X_0} = (0,0,0,0,\underset{\ge 0}{2},\underset{\ge 0}{6})^T - \text{SBAi}$$

v.s = 0 v.p.

(1s) → 3 0 1 −1 0 0

B	C_B	P_0	P_1	P_2	P_3	P_4 ↓	P_5^c	P_6^c	$\theta_i = \frac{P_0}{P_j\downarrow} > 0$
← P_5^c	0	2	1	2	0	$\boxed{1}$	1	0	$\frac{P_0}{P_4\downarrow}$ $\frac{2}{1}=2$ / ·(−2)
P_6^c	0	6	1	1	−1	2	0	1	$\frac{6}{2}=3$ ← +
		$-f(\overline{X_0})=0$	−3	0	−1	1	0	0	$z_j - c_j$
P_4	−1	2	1	2	0	1	1	0	
P_6^c	0	2	−1	−3	−1	0	−2	1	
		$-f(\overline{X_1})=-2$	−4	−2	−1	0	−1	0	$z_j - c_j$

$\Rightarrow \begin{cases} \overline{X_0} = (0,0,0,0,2,6)^T \\ -f(\overline{X_0}) = 0 \end{cases}$

de pe coloana lui P_0 $\Rightarrow \begin{cases} \overline{X_1} = (0,0,0,2,0,2)^T \\ -f(\overline{X_1}) = -2 \end{cases}$

$$\text{Cl pt } (PPL)_s: \begin{cases} X_{optim}^{\text{standard}} = (0,0,0,2,0,2)^T \quad \text{S.O. și unică} \\ \min(-f) = -2 \end{cases} \Rightarrow \text{Cl. pt } (PPL)_g: \begin{cases} X_{optim}^{\text{inițial}} = (0,0,0,2)^T \quad \text{S.O. unică} \\ (\max f) = 2 \end{cases}$$