

Exo 7

$$f = (5, 12, 0, 0, 0)$$

$$A = \begin{pmatrix} -1 & 1 & 1 & 0 & 0 \\ 1 & 2 & 0 & 1 & 0 \\ 3 & 2 & 0 & 0 & 1 \end{pmatrix}, \quad b = \begin{pmatrix} 1 \\ 5 \\ 9 \end{pmatrix} \geq 0$$

$$B_0 = \{3, 4, 5\} \Rightarrow \tilde{A} = A$$

$$x_{B_0} = b$$

$$f_{B_0}^T = (0, 0, 0) \text{ donc } c = f^T \text{ et } Z = 0$$

B_0	x_1	x_2	x_3	x_4	x_5	
x_3	-1	1	1	0	0	1
x_4	1	2	0	1	0	5
x_5	3	2	0	0	1	9
	5	12	0	0	0	0

$$\begin{pmatrix} 1/1 = 1 \\ 5/2 = 2.5 \\ 9/2 = 4.5 \end{pmatrix} \leftarrow k=3$$

$$\uparrow \\ l=2$$

$$\text{donc } B_1 = \{2, 4, 5\}$$

B_1	x_1	x_2	x_3	x_4	x_5	
x_2	-1	1	1	0	0	1
x_4	3	0	-2	1	0	3
x_5	5	0	-2	0	1	7
	17	0	-12	0	0	12

$$\uparrow \\ l=1$$

$$\begin{pmatrix} \neq 0 \\ 1 \\ 1/(-1) \\ 3/3 \\ 5/5 \end{pmatrix} \leftarrow k=4$$

$$'x_2' = 'x_3' / 1$$

$$'x_4' = 'x_4' - 2 'x_2'$$

$$'x_5' = 'x_5' - 2 'x_2'$$

$$Z = Z + 12 x_2$$

$$'c' = 'c' - 12 'x_2'$$

$$\text{donc } B_2 = \{2, 1, 5\}$$

B_2	x_1	x_2	x_3	x_4	x_5	
x_2	0	1	1/3	1/3	0	2
x_1	1	0	-2/3	-1/3	0	1
x_5	0	0	4/3	-5/3	1	2
	0	0	-2/3	-17/3	0	29

$$'x_1' = 'x_4' / 3$$

$$'x_2' = 'x_2' - (-1) 'x_1' = 'x_2' + 'x_1'$$

$$'x_5' = 'x_5' - 5 'x_1'$$

$$Z = Z + 17 x_1$$

$$'c' = 'c' - 17 'x_1'$$

B_2 satisfait la CLO, donc la solution optimale est $\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$

et la valeur optimale vaut 29