

18.06.22

Analise o Problema de Programação Linear com Branch and Bound

③ (2) Utilize o algoritmo de Branch-and-Bound e resolva o problema linear

$$\text{Max } 3x_1 + 3x_2$$

S.a

$$\text{I } x_1 + 4x_2 \leq 12$$

$$\text{II } 6x_1 + 4x_2 \leq 24$$

$$x_1 \geq 0; x_2 \geq 0 \text{ ambos inteiros}$$

$$\text{I } x_1 + 4x_2 = 12$$

$$0 + 4x_2 = 12$$

$$4x_2 = 12 - 0$$

$$4x_2 = 12$$

$$x_2 = 12/4$$

$$\boxed{x_2 = 3}$$

x_1	x_2
0	3
12	0

$$x_1 + 4x_2 = 12$$

$$x_1 + 4 \cdot 0 = 12$$

$$x_1 + 0 = 12$$

$$x_1 = 12 - 0$$

$$\boxed{x_1 = 12}$$

$$\text{II } 6x_1 + 4x_2 = 24$$

$$6 \cdot 0 + 4x_2 = 24$$

$$0 + 4x_2 = 24$$

$$4x_2 = 24 - 0$$

$$4x_2 = 24$$

$$x_2 = 24/4$$

$$\boxed{x_2 = 6}$$

x_1	x_2
0	6
4	0

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$$6x_1 + 4x_2 = 24$$

$$6x_1 + 4 \cdot 0 = 24$$

$$6x_1 + 0 = 24$$

$$6x_1 = 24 - 0$$

$$6x_1 = 24$$

$$x_1 = \frac{24}{6}$$

$$x_1 = 4$$

$$x_1 = 4$$

$$x_1 = 4$$

$$x_1 = 4$$

$$x_1 = 4$$

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$$x_1 = 4$$

$$x_1 = 4$$

$$x_1 = 4$$

$$-48 - 20$$

$$40 \cdot 2,4$$

$$080$$

$$80$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

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$$12,0$$

$$9,6$$

$$2,4$$

$$2,4$$

$$2,4$$

$$2,4$$

$$2,4$$

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$$2,4$$

$$4,0$$

$$2,4$$

$$16,0$$

$$8,0$$

$$9,6$$

$$0$$

$$0$$

$$0$$

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$$0$$

$$3,0$$

$$2,4$$

$$12,0$$

$$6,0$$

$$7,2$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$0$$

$$3,2,4 + 3,2,4$$

$$7,2 + 7,2$$

$$14,4$$

$$14,4$$

$$14,4$$

$$14,4$$

$$14,4$$

$$14,4$$

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$$14,4$$

Reservas de todos os pontos na
pilha seguinte, além da soma do
grupo

$$3,33$$

$$3,00$$

$$0,00$$

$$0,00$$

$$0,00$$

$$0,00$$

$$0,00$$

$$0,00$$

$$0,00$$

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Resultado Final (Conoce Final)

$$\begin{aligned} z &= 14,4 \\ x_1 &= 2,4 \\ x_2 &= 2,4 \end{aligned}$$

$$2,5 \leq x_1 \leq 3$$

$$\begin{aligned} F \quad z &= 13 \\ x_1 &= 2 \\ x_2 &= 2,5 \\ 2,5 \leq x_2 \leq 3 \end{aligned}$$

$$\begin{aligned} G \quad z &= 13,5 \\ x_1 &= 3 \\ x_2 &= 1,5 \\ 1,5 \leq x_2 \leq 2 \end{aligned}$$

$$\begin{aligned} z &= 12 \\ x_1 &= 2 \\ x_2 &= 2 \\ \text{barrido} \end{aligned}$$

$$\begin{aligned} z &= 9 \\ x_1 &= 0 \\ x_2 &= 3 \end{aligned}$$

$$\begin{aligned} z &= 12,99 \\ x_1 &= 3,33 \\ x_2 &= 1 \\ 3,5 \leq x_1 \leq 4 \end{aligned}$$

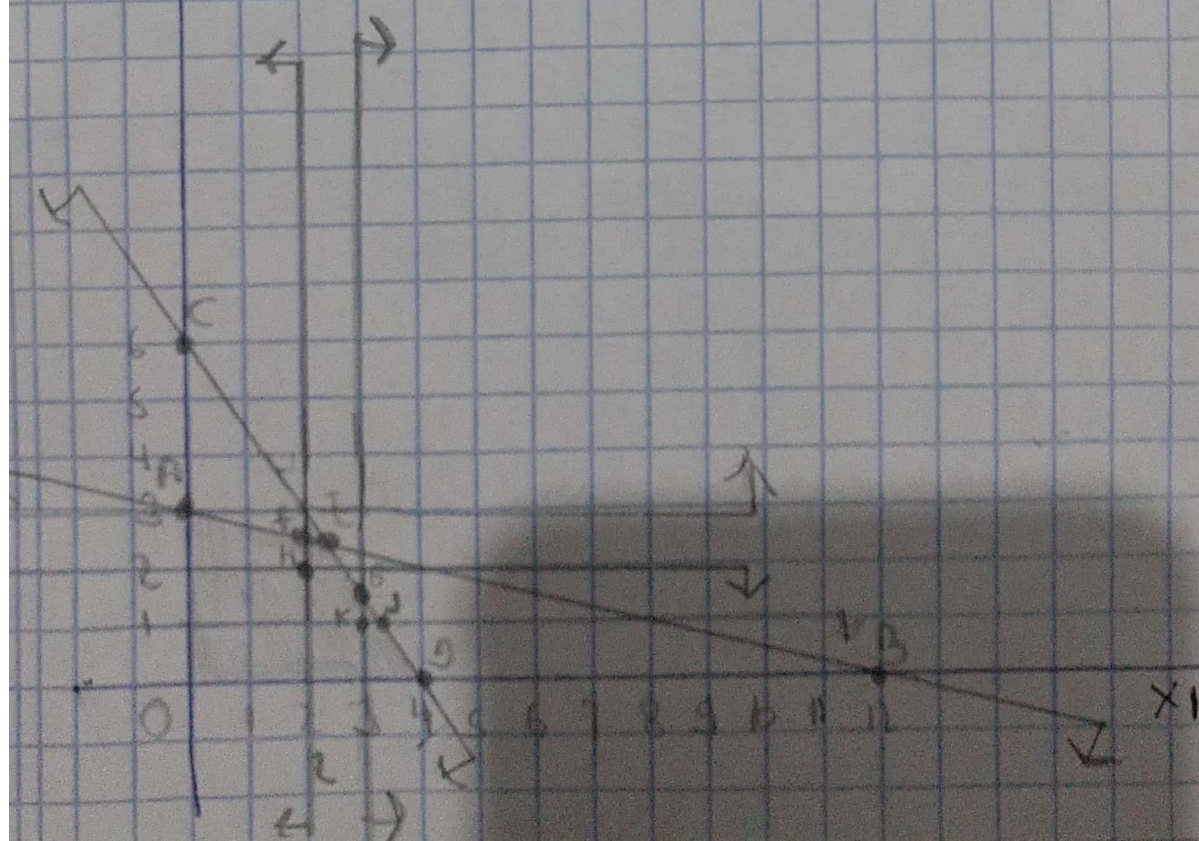
Demolicao
de 3
casas

$$\begin{aligned} z &= 12 \\ x_1 &= 3 \\ x_2 &= 1 \\ \text{barrido} \end{aligned}$$

$$\begin{aligned} z &= 12 \\ x_1 &= 4 \\ x_2 &= 0 \\ \text{barrido} \end{aligned}$$

Para 3 resultados iguais com o valor final de 12

x_2



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F) $x_1 + 4x_2 = 12$

$2 + 4x_2 = 12$

$4x_2 = 12 - 2$

$4x_2 = 10$

$x_2 = 10$

4

$x_2 = 2,5 \quad (2; 2,5)$

$z = 3x_1 + 3x_2$

$z = 3 \cdot 2 + 3 \cdot 2,5$

$z = 6 + 7,5$

$z = 13,5$

$2 \leq x_2 \leq 3$

$H \neq (2, 2)$

$z = 3 \cdot 2 + 3 \cdot 2$

$z = 6 + 6$

$z = 12$

$I) (0, 3)$

$z = 3 \cdot 0 + 3 \cdot 3$

$z = 0 + 9$

$z = 9$

Observações o ponto I e
m veracidade o ponto A
estão plaus

G) $6x_1 + 4x_2 = 24$

$6 \cdot 3 + 4x_2 = 24$

$18 + 4x_2 = 24$

$4x_2 = 24 - 18$

$4x_2 = 6$

$x_2 = 6$

4

$x_2 = 1,5 \quad (3; 1,5)$

$z = 3x_1 + 3x_2$

$z = 3 \cdot 3 + 3 \cdot 1,5$

$z = 9 + 4,5$

$z = 13,5$

J) $6x_1 + 4x_2 = 24$

$6x_1 + 4 \cdot 1 = 24$

$6x_1 + 4 = 24$

$6x_1 = 24 - 4$

$6x_1 = 20$

$x_1 = \frac{20}{6} \quad (3,33; 1)$

6

$x_1 = 3,33$

$z = 3 \cdot 3,33 + 3 \cdot 1$

$z = 9,99 + 3$

$z = 12,99$

K) $(3, 1)$

$z = 3 \cdot 3 + 3 \cdot 1$

$z = 9 + 3$

$z = 12$

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 $D(4,0)$

$$z = 3.4 + 3.0$$

$$z = 12 + 0$$

$$z = 12$$