Talis Souda - Calculo numéricos - Trabalho 1

1- $-60,06_{10} = ?_2$

$60_{10} = 111100_2$

60 | 2
0 30 | 2
0 15 | 2
1 7 | 2
1 3 | 2
1 1 | 2
1 0

$0,06_{10} = 0000111101011100001$

$0,06 \cdot 2 = 0 + 0,12$
$0,12 \cdot 2 = 0 + 0,24$
$0,24 \cdot 2 = 0 + 0,48$
$0,48 \cdot 2 = 0 + 0,96$
$0,96 \cdot 2 = 1 + 0,92$
$0,92 \cdot 2 = 1 + 0,84$
$0,84 \cdot 2 = 1 + 0,68$
$0,68 \cdot 2 = 1 + 0,36$
$0,36 \cdot 2 = 0 + 0,72$
$0,72 \cdot 2 = 1 + 0,44$
$0,44 \cdot 2 = 0 + 0,88$
$0,88 \cdot 2 = 1 + 0,76$
$0,76 \cdot 2 = 1 + 0,52$
$0,52 \cdot 2 = 1 + 0,04$
$0,04 \cdot 2 = 0 + 0,08$
$0,08 \cdot 2 = 0 + 0,16$
$0,16 \cdot 2 = 0 + 0,32$
$0,32 \cdot 2 = 0 + 0,64$
$0,64 \cdot 2 = 1 + 0,28$

$-60,06_{10} = 111100,0000111101011100001$
$= 1,11100000011110101110000\,1 \cdot 2^5$
(23 bits; ↓ arredondamento para cima)

$e = 5 + 127 = 132$
$132_{10} = 10000100$

$11100000011110101110000_2 + 1_2 = 11100000011110101110001_2 = f$

1	10000100	11100000011110101110001
S	e	f

$Erro = \left| \frac{VA - VE}{VE} \right|$

$VA: -60,06000137329101562 5$
$VE: -60,06$

$Erro = 0,0000022\%$

2-

3	2	5	⋮	3
3/2	1	5/2	⋮	3/2
-3	2	5	⋮	4

Fixo linha 1 $\quad a_{ik} = \frac{3/2}{3} = 1/2$

$k=1 \quad i=2$

$a_{21} = 3/2 - 1/2 \cdot 3 = 0$

$a_{22} = 1 - 1/2 \cdot 2 = 0$

$a_{23} = 5/2 - 1/2 \cdot 5 = 0$

$a_{24} = 3/2 - 1/2 \cdot 3 = 0$

$\longrightarrow$

3	2	5	⋮	3
0	0	0	⋮	0
-3	2	5	⋮	4

$i=3$

$a_{ik} = \frac{-3}{3} = -1$

$a_{31} = -3 - (-1) \cdot 3 = 0$

$a_{32} = 2 - (-1) \cdot 2 = 4$

$a_{33} = 5 - (-1) \cdot 5 = 10$

$a_{34} = 4 - (-1) \cdot 3 = 7$

$\longrightarrow$

3	2	5	⋮	3
0	0	0	⋮	0
0	4	10	⋮	7

$L_1 \to \frac{L_1}{3}$

$L_3 \to \frac{L_3}{4}$

1	2/3	5/3	1
0	0	0	0
0	1	5/2	7/4

Resolvendo a linha 3:

$y + 5/2 \cdot z = 7/4$

$y = 7/4 - 5/2 \cdot z$

Resolvendo a linha 1:

$x + 2/3 \cdot y + 5/3 \cdot z = 1$

$x + 2/3 \cdot (7/4 - 5/2 \cdot z) + 5/3 \cdot z = 1$

$x + 7/6 - 5/3 \cdot z + 5/3 \cdot z = 1$

$x = 1 - 7/6 = -1/6$

$S = \{(-1/6, 7/4 - 5/2 \cdot z, z) \in \mathbb{R}^3\}$

$$\left|\begin{array}{ccc|c} 3 & 2 & 5 & 3 \\ 3/2 & 1 & 5/2 & 7/2 \\ -3 & 2 & 5 & 4 \end{array}\right|$$

$k=1 \quad i=2 \quad \frac{a_{ik}}{a_{kk}} = \frac{3/2}{3} = 1/2$

$a_{21} = 3/2 - 1/2 \cdot 3 = 0$

$a_{22} = 1 - 1/2 \cdot 2 = 0$

$a_{23} = 5/2 - 1/2 \cdot 5 = 0$

$a_{24} = 7/2 - 1/2 \cdot 3 = 2$

$\rightarrow$

$$\left|\begin{array}{ccc|c} 3 & 2 & 5 & 3 \\ 0 & 0 & 0 & 2 \\ -3 & 2 & 5 & 4 \end{array}\right|$$

Linha 2 é impossível, portanto o sistema é impossível