E04 — ANN0001 — CCI

Aluno: ENDREW RAFAEL TREPTOW HANG Submeter até: 17/09/2019 23:59hs

Q1 Use o método iterativo de Jacobi, com estimativa inicial $X^{(1)} = [1.3, -1.0, -0.9, -4.2, -2.7, 0.2, 1.0]$, para encontrar a aproximação $X^{(10)}$ da solução do sistema

$$\begin{cases} 12.5x_1 + 2.0x_2 - 0.2x_3 + 0.2x_4 - 1.1x_5 - 1.7x_6 - 1.6x_7 = -0.4 \\ 0.0x_1 + 9.1x_2 + 2.1x_3 - 1.5x_4 - 0.2x_5 - 0.8x_6 + 0.6x_7 = -1.4 \\ -0.2x_1 - 0.9x_2 + 10.6x_3 - 0.8x_4 + 1.6x_5 + 0.0x_6 - 1.1x_7 = -3.1 \\ 1.8x_1 + 0.7x_2 - 1.5x_3 + 14.4x_4 + 1.9x_5 + 2.1x_6 + 0.1x_7 = 3.6 \\ -2.7x_1 + 2.2x_2 - 0.2x_3 + 1.9x_4 + 14.5x_5 + 0.7x_6 + 1.1x_7 = 2.3 \\ -2.0x_1 + 0.2x_2 - 1.7x_3 - 1.0x_4 + 2.9x_5 + 8.8x_6 - 0.7x_7 = -2.0 \\ 1.5x_1 - 0.7x_2 + 0.4x_3 - 2.8x_4 - 0.3x_5 - 1.1x_6 + 12.5x_7 = 0.9 \end{cases}$$

a) $[-0.04056247, -0.07453148, -0.28644528, 0.25575605, 0.13222564, -0.29389466, 0.11779311]$

[illegible] $[-0.04228373, -0.07625274, -0.28816654, 0.25403479, 0.13050438, -0.29561592, 0.11607185]$

c) $[-0.04042797, -0.07439698, -0.28631078, 0.25589055, 0.13236014, -0.29376016, 0.11792761]$

d) $[-0.04128228, -0.07525129, -0.28716509, 0.25503624, 0.13150583, -0.29461447, 0.1170733]$

e) $[-0.04076655, -0.07473556, -0.28664936, 0.25555197, 0.13202156, -0.29409874, 0.11758903]$

f) $[-0.04126005, -0.07522906, -0.28714286, 0.25505847, 0.13152806, -0.29459224, 0.11709553]$

```
iteraçoes:
X1
1.3, -1.0, -0.9, -4.2, -2.7, 0.2, 1.0
X2
0.0984, -0.74615385, -0.15849057, 0.3625, 1.00482759, 0.40909091, -1.0992
X3
0.08241236, 0.07300422, -0.59233043, 0.07285476, 0.30410529, -0.59594809, 0.16479494
X4
-0.08751756, -0.0617185, -0.30800226, 0.22008824, 0.1614416, -0.40345818, 0.05632789
X5
-0.06402797, -0.08212504, -0.30125712, 0.26900149, 0.13380519, -0.32897252, 0.10657199
X6
-0.04730832, -0.07299099, -0.28946944, 0.26019496, 0.12755151, -0.30320468, 0.11924266
X7
-0.04386432, -0.07587042, -0.28678425, 0.25586821, 0.12839033, -0.29526716, 0.11751542
X8
-0.04235918, -0.07637315, -0.28759615, 0.25460115, 0.12982034, -0.29480576, 0.11660441
X9
-0.04219948, -0.07626259, -0.28801646, 0.25410323, 0.13037855, -0.29529681, 0.11621272
X10 e resultado final:
-0.04228373, -0.07625274, -0.28816654, 0.25403479, 0.13050437, -0.29561592, 0.11607185
```

```
a = [1.3, -1.0, -0.9, -4.2, -2.7, 0.2, 1.0]
a2 = list()

print("iteraçoes:")

for i in range(1, 10):
    print(f"X{i}")
    print(*[round(i, 8) for i in a], sep=', ')
    a2.append((-2*a[1]+0.2*a[2]-0.2*a[3]+1.1*a[4]+1.7*a[5]+1.6*a[6]-0.4)/12.5)
    a2.append((0*a[0]-2.1*a[2]+1.5*a[3]+0.2*a[4]+0.8*a[5]-0.6*a[6]-1.4)/9.1)
    a2.append((0.2*a[0]+0.9*a[1]+0.8*a[3]-1.6*a[4]+0*a[5]+1.1*a[6]-3.1)/10.6)
    a2.append((-1.8*a[0]-0.7*a[1]+1.5*a[2]-1.9*a[4]-2.1*a[5]-0.1*a[6]+3.6)/14.4)
    a2.append((2.7*a[0]-2.2*a[1]+0.2*a[2]-1.9*a[3]-0.7*a[5]-1.1*a[6]+2.3)/14.5)
    a2.append((2.0*a[0]-0.2*a[1]+1.7*a[2]+1.0*a[3]-2.9*a[4]+0.7*a[6]-2.0)/8.8)
    a2.append((-1.5*a[0]+0.7*a[1]-0.4*a[2]+2.8*a[3]+0.3*a[4]+1.1*a[5]+0.9)/12.5)
    a = list(a2)
    a2.clear()

print("X10 e resultado final:")

print(*[round(i, 8) for i in a], sep=', ')
```