

Reporte de operaciones con S.E.L

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Análisis numérico



Método iterativo de Jacobi

Resolución del sistema de ecuaciones lineales A

$$7a_0 + 8a_1 = 2$$

$$74a_0 + a_1 = 4$$

$$\mathbf{A} = \begin{bmatrix} 7 & 8 \\ 74 & 1 \end{bmatrix}$$

Fórmula del proceso iterativo:

$$\mathbf{X}^{(k)} = \mathbf{TX}^{(k-1)} + \mathbf{C} \quad \forall k \geq 1$$

Condiciones iniciales de proceso:

$$\mathbf{T} = \begin{bmatrix} 0 & -1.14286 \\ -74 & 0 \end{bmatrix} \quad \mathbf{C} = \begin{bmatrix} 0.285714 \\ 4 \end{bmatrix} \quad \mathbf{X}^{(0)} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

Resultados de aproximaciones de la solución $\mathbf{X} \approx \mathbf{X}^{(k)}$

k	1	2	3	4	5	6	7
$a_0^{(k)}$	0	0.285714	-4.28571	19.8776	-366.735	1676.79	-31019.6
$a_1^{(k)}$	0	4	-17.1429	321.143	-1466.94	27142.4	-124078

k	8	9	10	11	12	13	14
$a_0^{(k)}$	141804	-2.62337e+06	1.19926e+07	-2.21862e+08	1.01423e+09	-1.87632e+10	8.57747e+10
$a_1^{(k)}$	2.29545e+06	-1.04935e+07	1.9413e+08	-8.8745e+08	1.64178e+10	-7.50529e+10	1.38848e+12

k	15	16	17	18	19	20	21
$a_0^{(k)}$	-1.58683e+12	7.25409e+12	-1.34201e+14	6.13489e+14	-1.13495e+16	5.18836e+16	-9.59847e+17
$a_1^{(k)}$	-6.34733e+12	1.17426e+14	-5.36803e+14	9.93085e+15	-4.53982e+16	8.39866e+17	-3.83939e+18

k	22	23	24	25	26	27	28
$a_0^{(k)}$	4.38787e+18	-8.11756e+19	3.71089e+20	-6.86514e+21	3.13835e+22	-5.80595e+23	2.65415e+24
$a_1^{(k)}$	7.10287e+19	-3.24703e+20	6.007e+21	-2.74606e+22	5.0802e+23	-2.32238e+24	4.2964e+25

k	29	30	31	32	33	34	35
$a_0^{(k)}$	-4.91017e+25	2.24465e+26	-4.1526e+27	1.89833e+28	-3.51192e+29	1.60545e+30	-2.97008e+31
$a_1^{(k)}$	-1.96407e+26	3.63353e+27	-1.66104e+28	3.07293e+29	-1.40477e+30	2.59882e+31	-1.18803e+32

k	36	37	38	39	40	41	42
$a_0^{(k)}$	1.35775e+32	-2.51184e+33	1.14827e+34	-2.1243e+35	9.71107e+35	-1.79655e+37	8.21279e+37
$a_1^{(k)}$	2.19786e+33	-1.00473e+34	1.85876e+35	-8.49718e+35	1.57198e+37	-7.18619e+37	1.32945e+39

k	43	44	45	46	47	48	49
$a_0^{(k)}$	-1.51937e+39	6.94567e+39	-1.28495e+41	5.87405e+41	-1.0867e+43	4.96777e+43	-9.19038e+44
$a_1^{(k)}$	-6.07746e+39	1.12433e+41	-5.1398e+41	9.50863e+42	-4.3468e+43	8.04158e+44	-3.67615e+45

k	50	51	52	53	54	55	56
$a_0^{(k)}$	4.20132e+45	-7.77243e+46	3.55311e+47	-6.57326e+48	3.00492e+49	-5.5591e+50	2.5413e+51
$a_1^{(k)}$	6.80088e+46	-3.10897e+47	5.7516e+48	-2.6293e+49	4.86421e+50	-2.22364e+51	4.11373e+52

k	57	58	59	60	61	62	63
$a_0^{(k)}$	-4.70141e+52	2.14922e+53	-3.97605e+54	1.81762e+55	-3.3626e+56	1.53719e+57	-2.8438e+58
$a_1^{(k)}$	-1.88056e+53	3.47904e+54	-1.59042e+55	2.94228e+56	-1.34504e+57	2.48833e+58	-1.13752e+59

k	64	65	66	67	68	69	70
$a_0^{(k)}$	1.30002e+59	-2.40504e+60	1.09945e+61	-2.03398e+62	9.29819e+62	-1.72016e+64	7.86361e+64
$a_1^{(k)}$	2.10441e+60	-9.62017e+60	1.77973e+62	-8.13591e+62	1.50514e+64	-6.88066e+64	1.27292e+66

k	71	72	73	74	75	76	77
$a_0^{(k)}$	-1.45477e+66	6.65037e+66	-1.23032e+68	5.62431e+68	-1.0405e+70	4.75656e+70	-8.79964e+71
$a_1^{(k)}$	-5.81907e+66	1.07653e+68	-4.92127e+68	9.10435e+69	-4.16199e+70	7.69968e+71	-3.51985e+72

k	78	79	80	81	82	83	84
$a_0^{(k)}$	4.02269e+72	-7.44198e+73	3.40205e+74	-6.29379e+75	2.87716e+76	-5.32275e+77	2.43326e+78
$a_1^{(k)}$	6.51173e+73	-2.97679e+74	5.50706e+75	-2.51751e+76	4.6574e+77	-2.1291e+78	3.93883e+79

k	85	86	87	88	89	90	91
$a_0^{(k)}$	-4.50152e+79	2.05784e+80	-3.807e+81	1.74034e+82	-3.21964e+83	1.47183e+84	-2.72289e+85
$a_1^{(k)}$	-1.80061e+80	3.33113e+81	-1.5228e+82	2.81718e+83	-1.28785e+84	2.38253e+85	-1.08916e+86

k	92	93	94	95	96	97	98
$a_0^{(k)}$	1.24475e+86	-2.30279e+87	1.0527e+88	-1.9475e+89	8.90286e+89	-1.64703e+91	7.52928e+91
$a_1^{(k)}$	2.01494e+87	-9.21115e+87	1.70406e+89	-7.79e+89	1.44115e+91	-6.58812e+91	1.2188e+93

k	99	100	101
$a_0^{(k)}$	-1.39292e+93	6.36762e+93	-1.17801e+95
$a_1^{(k)}$	-5.57167e+93	1.03076e+95	-4.71204e+95