Tabelas do relatório

Exercício 1

Método	N	núm. iterações	tempo(seg)	erro máx
Jacobi	8.0	121.0	0.000785	0.00028
Jacobi	16.0	424.0	0.009571	0.000889
Jacobi	32.0	1415.0	0.07374700000000001	0.004099
Jacobi	64.0	4517.0	0.355685	0.016576
Jacobi	128.0	13473.0	4.291022	0.066375
Jacobi	256.0	35490.0	45.016684999999995	0.265548
Jacobi	512.0	69211.0	365.627413	1.052132
Gauss-Seidel	8.0	67.0	0.000111000000000001	0.000405
Gauss-Seidel	16.0	233.0	0.001557	0.000396
Gauss-Seidel	32.0	786.0	0.017034	0.002029
Gauss-Seidel	64.0	2560.0	0.20940100000000003	0.008267
Gauss-Seidel	128.0	7914.0	2.611773	0.033178
Gauss-Seidel	256.0	22399.0	29.069734000000004	0.132794
Gauss-Seidel	512.0	52718.0	283.888385	0.530795
SOR	8.0	21.0	6.4e-05	0.000478
SOR	16.0	40.0	0.000375	0.000109
SOR	32.0	78.0	0.0019089999999999999	0.000109
SOR	64.0	149.0	0.013288999999999999	0.000229
SOR	128.0	284.0	0.100017	0.000488
SOR	256.0	542.0	0.780262	0.001011
SOR	512.0	1044.0	5.981407	0.001737
SOR_2	8.0	62.0	0.000517	0.000412
SOR_2	16.0	229.0	0.006625	0.000386
SOR_2	32.0	783.0	0.039948000000000004	0.002014
SOR_2	64.0	2557.0	0.235433	0.008265

SOR_2	128.0	7912.0	2.753721	0.033171
SOR_2	256.0	22398.0	31.543532	0.13278
SOR_2	512.0	52717.0	293.935173	0.530795

[Tabela 1 - exercício 1-A com TOL= $10^{-5}\,h$]

Método	N	núm. iterações	tempo(seg)	erro máx
Jacobi	8.0	50.0	9.2e-05	0.012637
Jacobi	16.0	179.0	0.000933	0.00285399999999999998
Jacobi	32.0	607.0	0.013517	0.000851
Jacobi	64.0	1974.0	0.155951	0.00640999999999999999
Jacobi	128.0	6059.0	1.986221	0.02648
Jacobi	256.0	16875.0	22.214029	0.106196
Jacobi	512.0	38048.0	199.603644	0.424887
Gauss-Seidel	8.0	55.0	8.3e-05	0.012803
Gauss-Seidel	16.0	172.0	0.001151	0.00355900000000000005
Gauss-Seidel	32.0	480.0	0.010283	0.002428
Gauss-Seidel	64.0	1170.0	0.10354000000000001	0.00728199999999999999
Gauss-Seidel	128.0	3501.0	1.149429	0.017571
Gauss-Seidel	256.0	10281.0	13.494824	0.056603
Gauss-Seidel	512.0	26387.0	140.065703	0.21495999999999999998
SOR	8.0	19.0	5.6000000000000006e-05	0.012725
SOR	16.0	37.0	0.000213	0.003249
SOR	32.0	72.0	0.0015429999999999999	0.0008849999999999999
SOR	64.0	137.0	0.011386	0.000383
SOR	128.0	261.0	0.092487	0.000516
SOR	256.0	515.0	0.732266	0.000611
SOR	512.0	1026.0	5.838072	0.000643
SOR_2	8.0	52.0	0.0006580000000000001	0.012789
SOR_2	16.0	170.0	0.004647	0.003546

SOR_2	32.0	478.0	0.023232	0.002432
SOR_2	64.0	1169.0	0.116862	0.00728
SOR_2	128.0	3500.0	1.185167	0.017571
SOR_2	256.0	10280.0	13.633809	0.056608000000000006
SOR_2	512.0	26387.0	146.870236	0.21495

[Tabela 2 - exercício 1-B com TOL= $10^{-5}\,h$]

Método	N	núm. iterações	tempo(seg)	erro máx
Jacobi	8.0	209.0	0.001173	0.0004799999999999996
Jacobi	16.0	780.0	0.022112	0.000121
Jacobi	32.0	2846.0	0.082859	2.7000000000000002e-05
Jacobi	64.0	10249.0	0.909777000000001	1e-05
Jacobi	128.0	36405.0	13.022163	6.500000000000001e-05
Jacobi	256.0	127222.0	190.115381	0.000265
Jacobi	512.0	149999.0	877.842769	0.228273
Gauss-Seidel	8.0	111.0	0.000181	0.0004799999999999996
Gauss-Seidel	16.0	411.0	0.002318	0.000122
Gauss-Seidel	32.0	1502.0	0.034572000000000006	2.8999999999999997e-05
Gauss-Seidel	64.0	5426.0	0.514917	2e-06
Gauss-Seidel	128.0	19380.0	7.270587	3.1e-05
Gauss-Seidel	256.0	68267.0	102.307099	0.000132
Gauss-Seidel	512.0	149999.0	870.1904300000001	0.013609
SOR	8.0	30.0	5.1e-05	0.0004799999999999996
SOR	16.0	60.0	0.0003549999999999996	0.000122
SOR	32.0	118.0	0.002612	3.1e-05
SOR	64.0	229.0	0.022846	8e-06
SOR	128.0	442.0	0.171122	2e-06
SOR	256.0	855.0	1.361474	1e-06

SOR	512.0	1656.0	10.258146	1e-06
SOR_2	8.0	102.0	0.00073	0.00047999999999999996
SOR_2	16.0	404.0	0.014003999999999999	0.000122
SOR_2	32.0	1495.0	0.052631	2.8999999999999997e-05
SOR_2	64.0	5420.0	0.48660600000000004	2e-06
SOR_2	128.0	19375.0	6.993105	3.1e-05
SOR_2	256.0	68263.0	96.745401	0.000132
SOR_2	512.0	149999.0	896.3281710000001	0.013608000000000002

[Tabela 3 - exercício 1-A com TOL= $10^{-8}\,h$]

Método	N	núm. iterações	tempo(seg)	erro máx
Jacobi	8.0	84.0	0.000125	0.012712000000000001
Jacobi	16.0	320.0	0.001712000000000002	0.003209000000000005
Jacobi	32.0	1178.0	0.029442000000000003	0.000811
Jacobi	64.0	4265.0	0.369584	0.000197
Jacobi	128.0	15231.0	5.403887999999999	2.6000000000000002e-05
Jacobi	256.0	53568.0	77.53120899999999	9.4e-05
Jacobi	512.0	149999.0	775.394496	0.002185000000000003
Gauss-Seidel	8.0	99.0	0.000148	0.012712000000000001
Gauss-Seidel	16.0	350.0	0.002302	0.003209000000000005
Gauss-Seidel	32.0	1195.0	0.025072	0.000814
Gauss-Seidel	64.0	3931.0	0.31925	0.000208000000000000001
Gauss-Seidel	128.0	12294.0	4.034841	7.3e-05
Gauss-Seidel	256.0	35418.0	45.849144	0.000133
Gauss-Seidel	512.0	101751.0	534.490246	0.000408

SOR	8.0	29.0	8.2e-05	0.012712000000000001
SOR	16.0	56.0	0.0004599999999999996	0.003209000000000005
SOR	32.0	109.0	0.002727	0.000811999999999999
SOR	64.0	212.0	0.02104	0.000202999999999997
SOR	128.0	410.0	0.142516	5.1e-05
SOR	256.0	794.0	1.093804	1.3000000000000001e-05
SOR	512.0	1519.0	8.54918	5e-06
SOR_2	8.0	92.0	0.0002569999999999996	0.012712000000000001
SOR_2	16.0	345.0	0.003482	0.003209000000000005
SOR_2	32.0	1191.0	0.030683999999999996	0.000814
SOR_2	64.0	3928.0	0.364121000000000003	0.000208000000000001
SOR_2	128.0	12291.0	4.540373000000001	7.3e-05
SOR_2	256.0	35417.0	51.827606	0.000133
SOR_2	512.0	101750.0	593.794928	0.000408

[Tabela 4 - exercício 1-B com TOL= $10^{-8}\,h$]

Exercício 2

Método	N	núm. iterações	tempo(seg)
Jacobi	8.0	163.0	0.000226
Jacobi	16.0	593.0	0.003397
Jacobi	32.0	2097.0	0.042642
Jacobi	64.0	7247.0	0.566198
Jacobi	128.0	24393.0	7.940355999999995
Jacobi	256.0	79167.0	101.155112
Jacobi	512.0	149999.0	791.583025
Gauss-Seidel	8.0	87.0	0.000143
Gauss-Seidel	16.0	317.0	0.001660000000000002
Gauss-Seidel	32.0	1125.0	0.024299
Gauss-Seidel	64.0	3920.0	0.319834
Gauss-Seidel	128.0	13364.0	4.295128
Gauss-Seidel	256.0	44220.0	57.247384
Gauss-Seidel	512.0	139994.0	742.098634
SOR	8.0	25.0	6.6e-05
SOR	16.0	49.0	0.00035
SOR	32.0	94.0	0.002149
SOR	64.0	184.0	0.015887000000000002
SOR	128.0	355.0	0.124643
SOR	256.0	673.0	0.941688
SOR	512.0	1275.0	7.200155000000005
SOR_2	8.0	81.0	0.000193
SOR_2	16.0	311.0	0.002116
SOR_2	32.0	1120.0	0.024111
SOR_2	64.0	3915.0	0.33916
SOR_2	128.0	13360.0	4.636181
SOR_2	256.0	44217.0	61.261668000000001
SOR_2	512.0	139992.0	781.56666

[Tabela 5 - exercício 2-A com TOL= $10^{-5}\,h$]

Método	N	núm. iterações	tempo(seg)
Jacobi	8.0	163.0	0.000239
Jacobi	16.0	594.0	0.003238000000000004
Jacobi	32.0	2099.0	0.043185
Jacobi	64.0	7254.0	0.573038
Jacobi	128.0	24422.0	7.76748
Jacobi	256.0	79286.0	101.671591
Jacobi	512.0	149999.0	781.2710030000001
Gauss-Seidel	8.0	88.0	0.000268
Gauss-Seidel	16.0	319.0	0.001953
Gauss-Seidel	32.0	1129.0	0.031219999999999998
Gauss-Seidel	64.0	3930.0	0.340107
Gauss-Seidel	128.0	13392.0	4.681579
Gauss-Seidel	256.0	44305.0	58.925539
Gauss-Seidel	512.0	140285.0	732.7060849999999
SOR	8.0	25.0	5.9e-05
SOR	16.0	50.0	0.000293
SOR	32.0	96.0	0.002097
SOR	64.0	185.0	0.016293000000000002
SOR	128.0	359.0	0.12238399999999999
SOR	256.0	684.0	0.9398639999999999
SOR	512.0	1294.0	7.206264999999999
SOR_2	8.0	81.0	0.00014
SOR_2	16.0	313.0	0.001786
SOR_2	32.0	1124.0	0.024806
SOR_2	64.0	3925.0	0.33310100000000004
SOR_2	128.0	13388.0	4.504176
SOR_2	256.0	44303.0	59.204981000000004
SOR_2	512.0	140282.0	775.362213

[Tabela 6 - exercício 2-B com TOL= $10^{-5}\,h$]

Método	N	núm. iterações	tempo(seg)
Jacobi	8.0	250.0	0.00158
Jacobi	16.0	949.0	0.033815
Jacobi	32.0	3528.0	0.10519
Jacobi	64.0	12978.0	1.132803
Jacobi	128.0	47325.0	17.110536
Jacobi	256.0	149999.0	215.647385999 99998
Jacobi	512.0	149999.0	853.379738000 0001
Gauss-Seidel	8.0	131.0	0.000397
Gauss-Seidel	16.0	495.0	0.00379799999 99999997
Gauss-Seidel	32.0	1840.0	0.04231
Gauss-Seidel	64.0	6785.0	0.59932
Gauss-Seidel	128.0	24830.0	8.945659
Gauss-Seidel	256.0	90088.0	134.010980000 00002
Gauss-Seidel	512.0	149999.0	894.662775
SOR	8.0	34.0	5.79999999999 99994e-05
SOR	16.0	67.0	0.00041600000 000000003
SOR	32.0	132.0	0.003182
SOR	64.0	257.0	0.024285
SOR	128.0	513.0	0.197775
SOR	256.0	1025.0	1.63822
SOR	512.0	2049.0	12.721715
SOR_2	8.0	121.0	0.000309
SOR_2	16.0	486.0	0.002972
SOR_2	32.0	1832.0	0.041935
SOR_2	64.0	6778.0	0.620684
SOR_2	128.0	24823.0	9.137079
SOR_2	256.0	90081.0	130.314342999 99998

SOR_2	512.0	149999.0	995.8465199999999

[Tabela 7 - exercício 2-A com TOL= $10^{-8}\,h$]

Método	N	núm. iterações	tempo(seg)
Jacobi	8.0	250.0	0.000359
Jacobi	16.0	950.0	0.005047
Jacobi	32.0	3530.0	0.083034
Jacobi	64.0	12985.0	1.1774719999999999
Jacobi	128.0	47354.0	17.038597
Jacobi	256.0	149999.0	208.292321
Jacobi	512.0	149999.0	783.896175
Gauss-Seidel	8.0	132.0	0.000213
Gauss-Seidel	16.0	497.0	0.002769
Gauss-Seidel	32.0	1844.0	0.04124
Gauss-Seidel	64.0	6795.0	0.560659
Gauss-Seidel	128.0	24858.0	8.090082
Gauss-Seidel	256.0	90173.0	116.429029
Gauss-Seidel	512.0	149999.0	785.332353
SOR	8.0	34.0	5.6999999999999996e-05
SOR	16.0	68.0	0.000484
SOR	32.0	133.0	0.003038
SOR	64.0	259.0	0.023469999999999998
SOR	128.0	513.0	0.17763900000000002
SOR	256.0	1025.0	1.435459
SOR	512.0	2049.0	11.601696
SOR_2	8.0	121.0	0.000239
SOR_2	16.0	487.0	0.00358
SOR_2	32.0	1836.0	0.054436
SOR_2	64.0	6788.0	0.74732
SOR_2	128.0	24851.0	11.247467
SOR_2	256.0	90167.0	163.390621

SOR_2	512.0	149999.0	1026.591751

[Tabela 8 - exercício 2-B com TOL= 10^{-8} *h*]