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Steady state solution for a 2D rectangular plate
with borders at constant temperature
Absolute temperatures

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Based on lectures by professor Roberto Parreiras Tavares
and book Numerical Heat Transfer and Fluid Flow
by Suhas V. Patankar (1980)

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Input parameters:

Lenght in X direction: 2.5000
Lenght in Y direction: 2.5000
Nodes in X direction: 6
Nodes in Y direction: 6
Temperature T1 (left, right and bottom borders): 1200.0000
Temperature T2 (top border): 700.0000

SOLUTION of LINEAR SYSTEM: Comparison of four methods

- 1 - Jacobi Method
- 2 - Gauss-Seidel Method
- 3 - TDMA method without ADI
- 4 - TDMA method with ADI

No relaxation applied to solution.
Tolerance: 0.1000E-04

Iterations - Jacobi Method: 82
Iterations - Gauss-Seidel Method: 44
Iterations - TDMA method without ADI: 26
Iterations - TDMA method with ADI: 33

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Calculation Results

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I	J	X	Y	T_Jac	T_Gaus	T_TDMA	T_TDMA_ADI	Exact Sol
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0	0	0.0000	0.0000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
0	1	0.0000	0.5000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
0	2	0.0000	1.0000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
0	3	0.0000	1.5000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
0	4	0.0000	2.0000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
0	5	0.0000	2.5000	700.0000	700.0000	700.0000	700.0000	700.0000
1	0	0.5000	0.0000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
1	1	0.5000	0.5000	1177.2727	1177.2727	1177.2727	1177.2727	1178.1706
1	2	0.5000	1.0000	1145.0757	1145.0757	1145.0758	1145.0758	1146.9824
1	3	0.5000	1.5000	1088.2575	1088.2576	1088.2576	1088.2576	1091.1217
1	4	0.5000	2.0000	972.7273	972.7273	972.7273	972.7273	971.8294
1	5	0.5000	2.5000	700.0000	700.0000	700.0000	700.0000	700.0000
2	0	1.0000	0.0000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
2	1	1.0000	0.5000	1164.0151	1164.0151	1164.0151	1164.0151	1164.9136
2	2	1.0000	1.0000	1114.7727	1114.7727	1114.7727	1114.7727	1115.7941
2	3	1.0000	1.5000	1035.2272	1035.2273	1035.2273	1035.2273	1034.2059
2	4	1.0000	2.0000	902.6515	902.6515	902.6515	902.6515	896.9824
2	5	1.0000	2.5000	700.0000	700.0000	700.0000	700.0000	700.0000
3	0	1.5000	0.0000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
3	1	1.5000	0.5000	1164.0151	1164.0151	1164.0151	1164.0151	1164.9136
3	2	1.5000	1.0000	1114.7727	1114.7727	1114.7727	1114.7727	1115.7941
3	3	1.5000	1.5000	1035.2272	1035.2273	1035.2273	1035.2273	1034.2059
3	4	1.5000	2.0000	902.6515	902.6515	902.6515	902.6515	896.9824
3	5	1.5000	2.5000	700.0000	700.0000	700.0000	700.0000	700.0000
4	0	2.0000	0.0000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
4	1	2.0000	0.5000	1177.2727	1177.2727	1177.2727	1177.2727	1178.1706
4	2	2.0000	1.0000	1145.0757	1145.0758	1145.0758	1145.0758	1146.9824
4	3	2.0000	1.5000	1088.2575	1088.2576	1088.2576	1088.2576	1091.1217
4	4	2.0000	2.0000	972.7273	972.7273	972.7273	972.7273	971.8294
4	5	2.0000	2.5000	700.0000	700.0000	700.0000	700.0000	700.0000
5	0	2.5000	0.0000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
5	1	2.5000	0.5000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
5	2	2.5000	1.0000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
5	3	2.5000	1.5000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
5	4	2.5000	2.0000	1200.0000	1200.0000	1200.0000	1200.0000	1200.0000
5	5	2.5000	2.5000	700.0000	700.0000	700.0000	700.0000	700.0000