

Assignment-5

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Q.N.1(a)

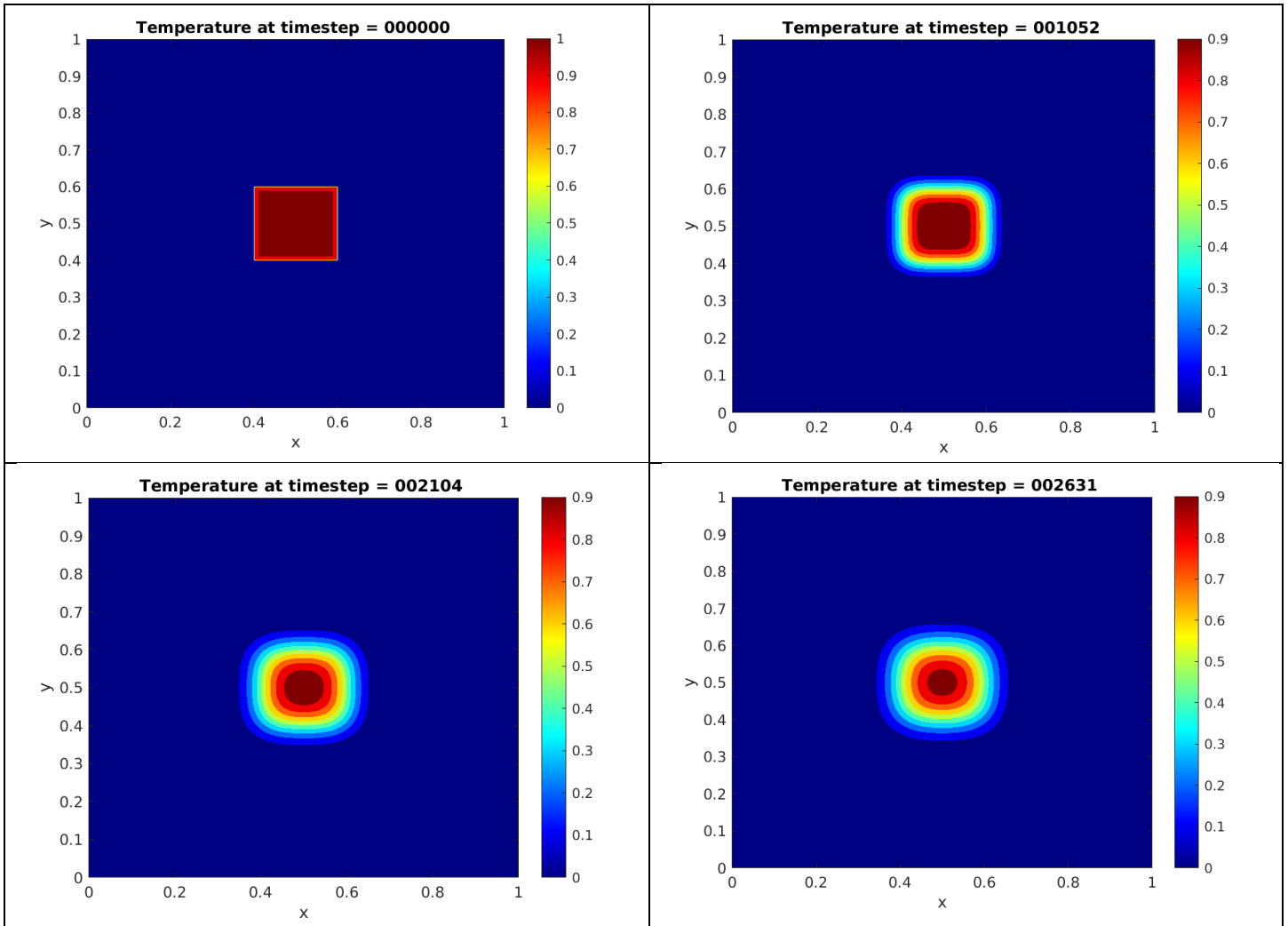


Figure 1. Contour Plots of Temperature Distribution using $p=1$ (Serial)

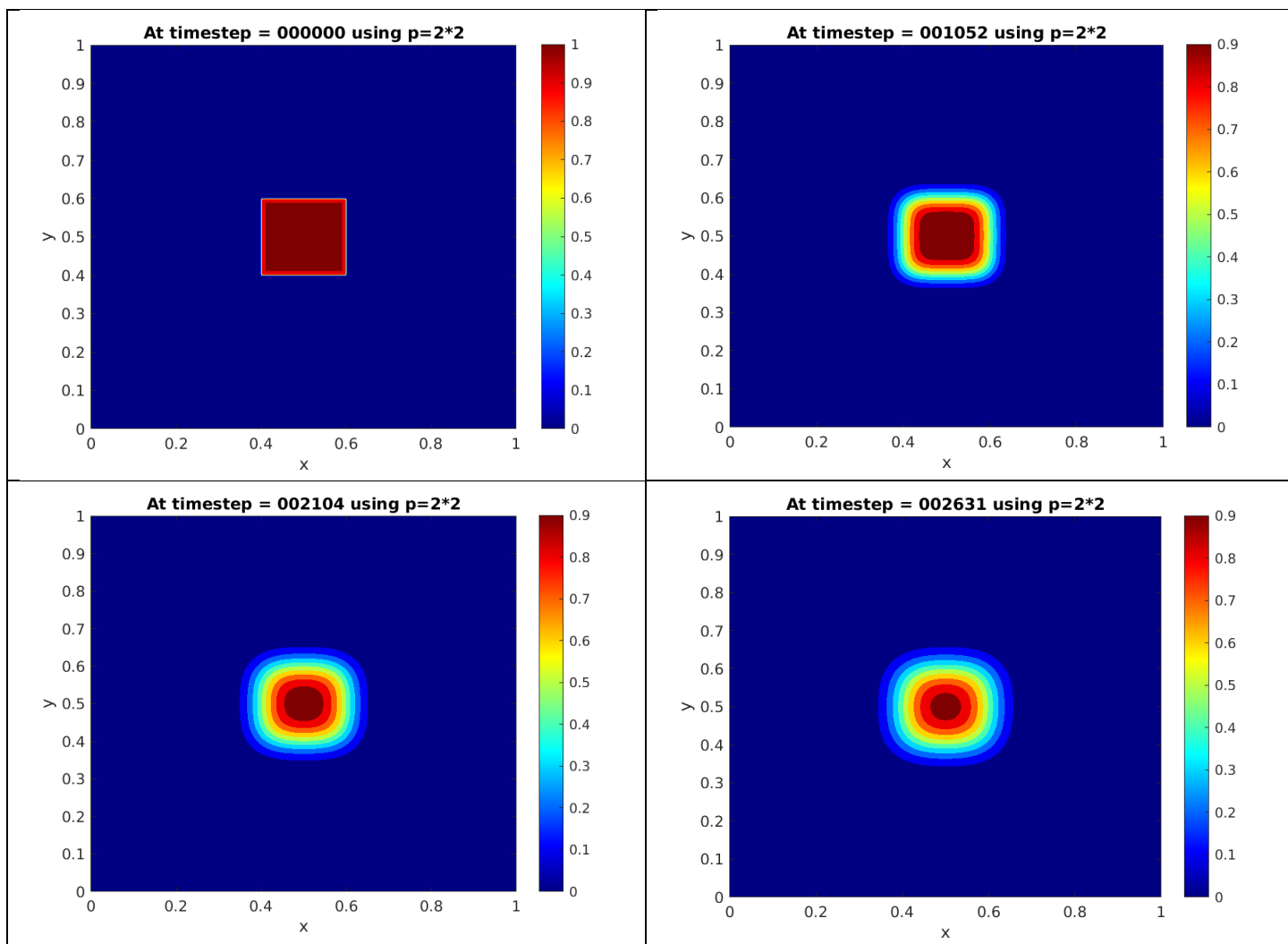


Figure 2. Contour Plots of Temperature Distribution using $p=4$ (2×2)

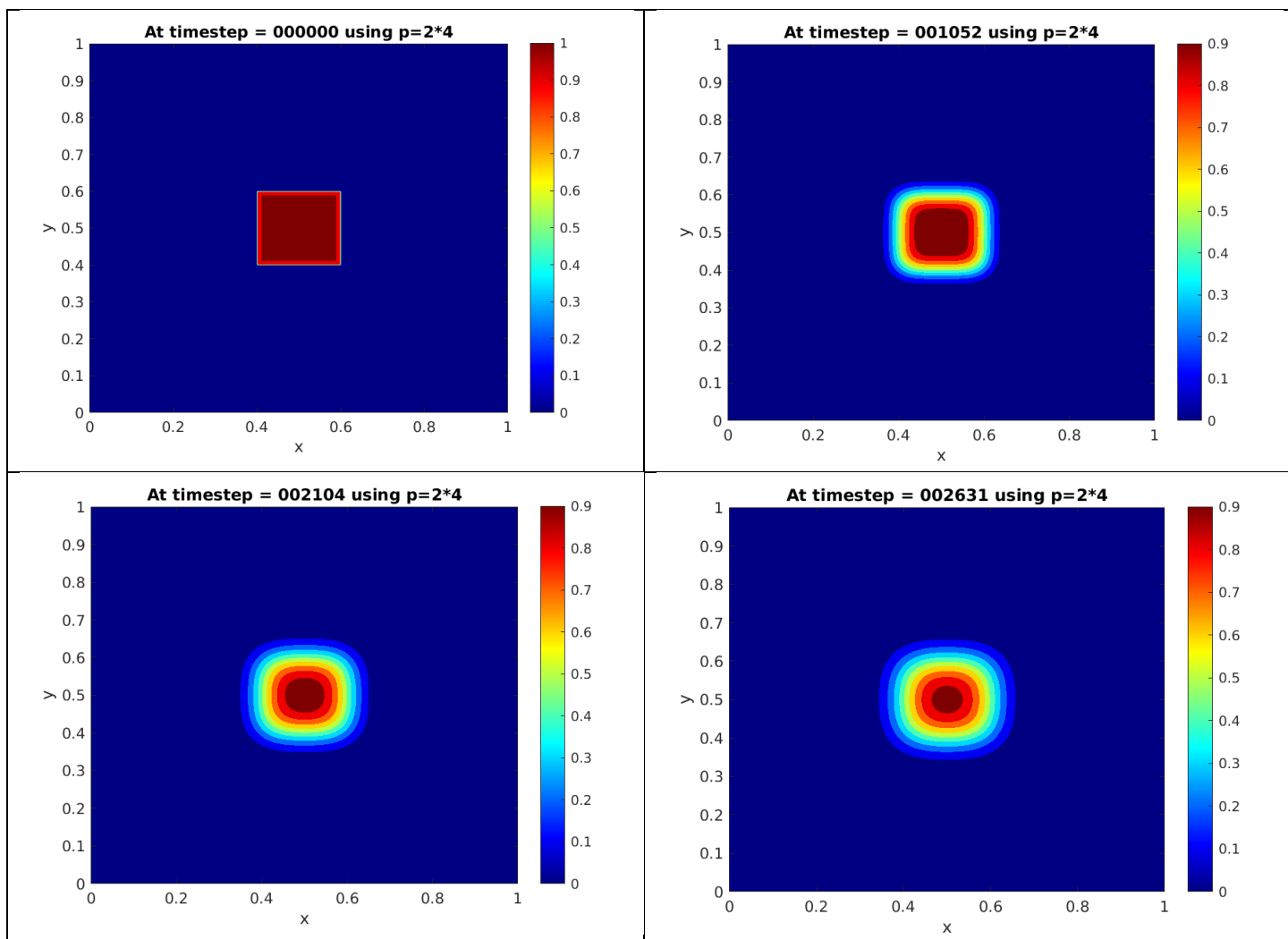


Figure 3. Contour Plots of Temperature Distribution using $p=8$ (2×4)

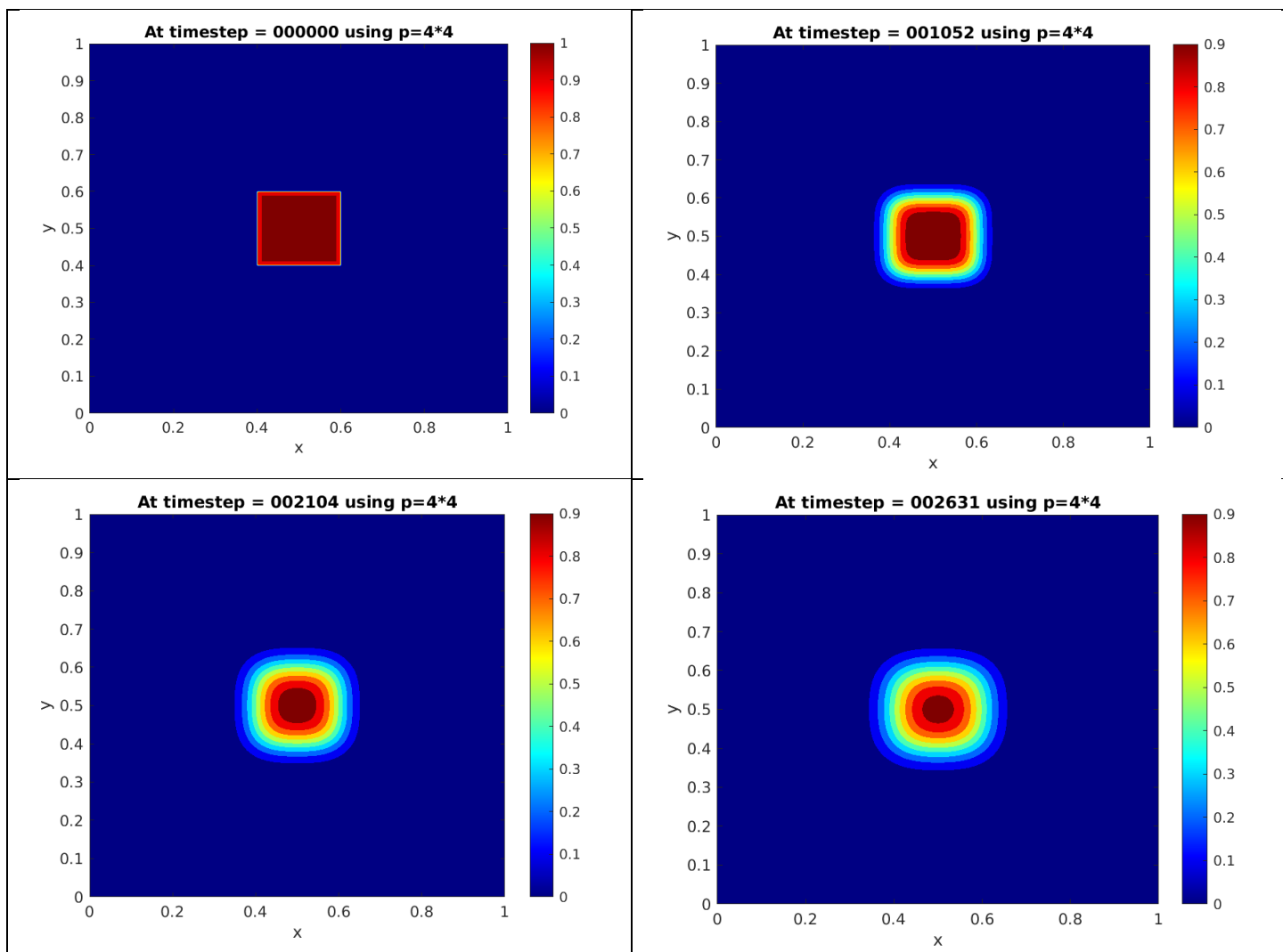


Figure 4. Contour Plots of Temperature Distribution using $p=16$ ($4*4$)

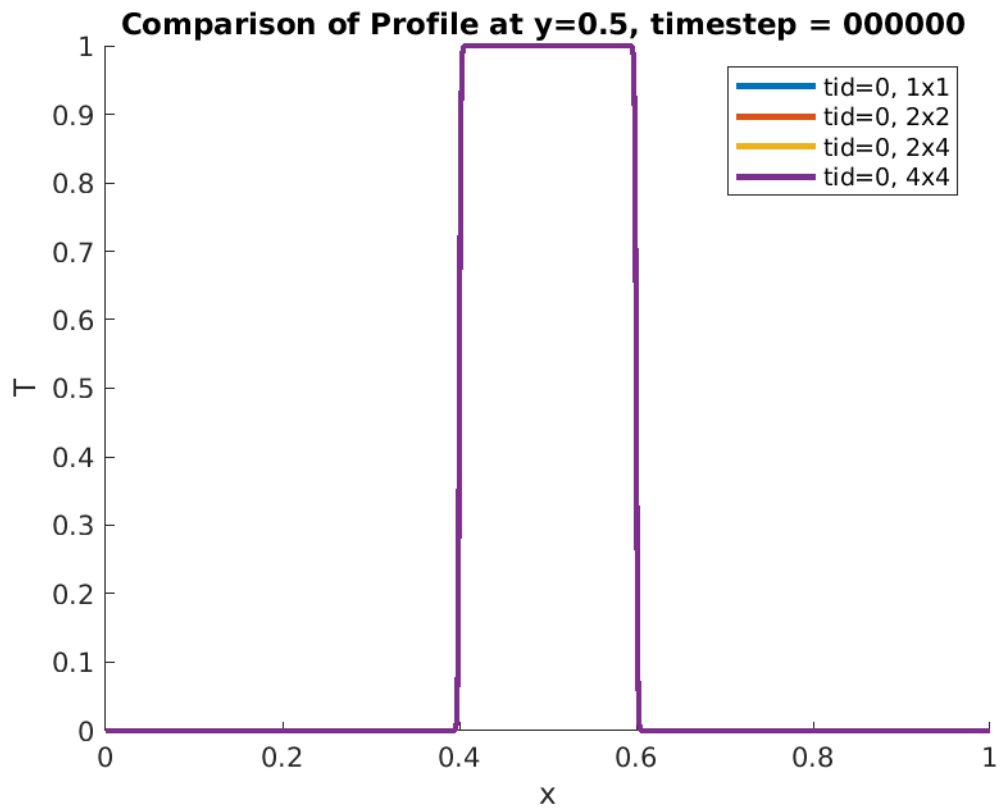


Figure 5. Comparison of profile at $y=0.5$ at timestep 0

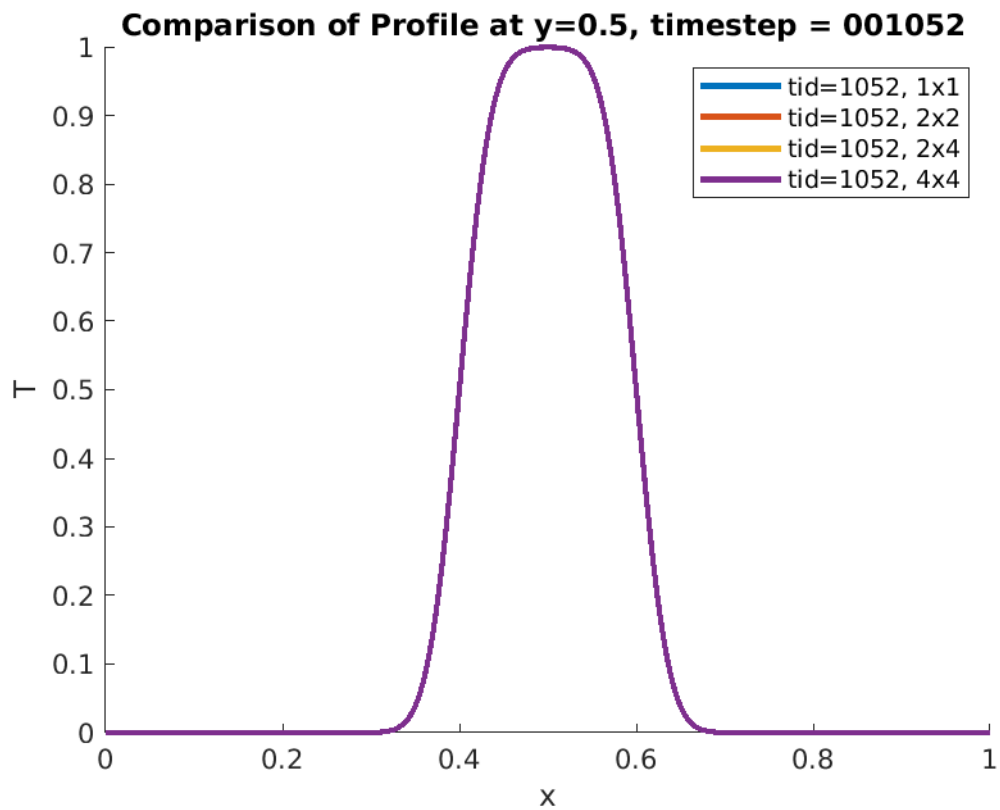


Figure 6. Comparison of profile at $y=0.5$ at timestep 1052

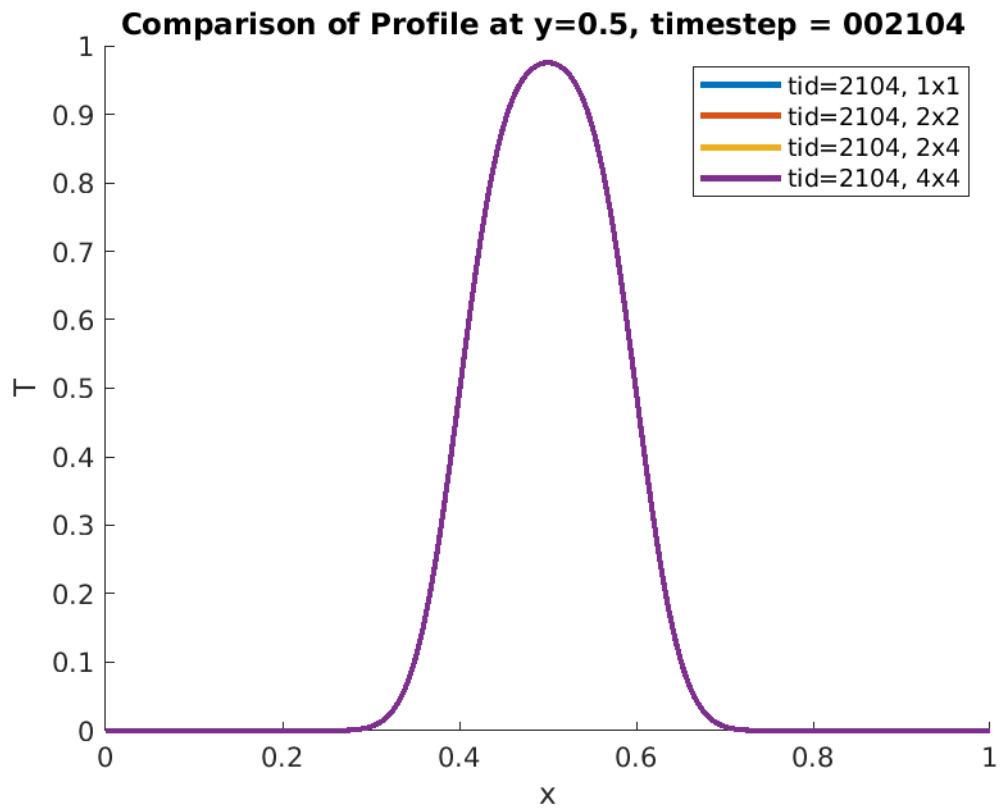


Figure 7. Comparison of profile at $y=0.5$ at timestep 2104

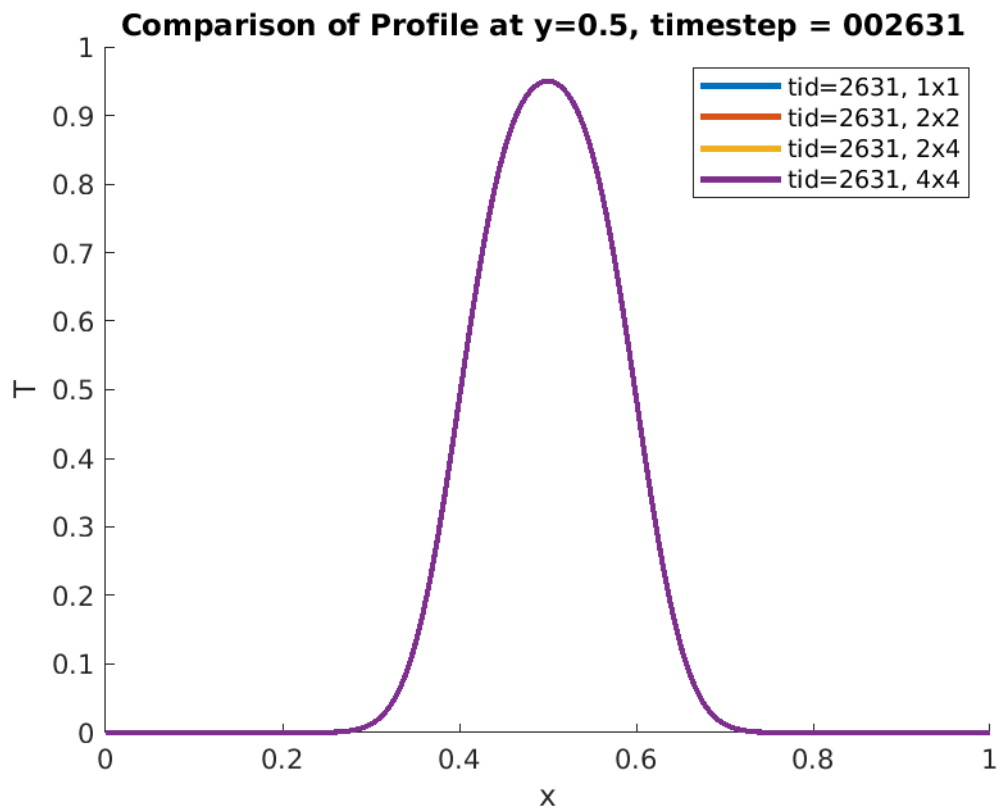


Figure 8. Comparison of profile at $y=0.5$ at timestep 2631

Q.N.1(b)

Table 1. Difference Between Results Obtained from Serial and Parallelized Versions

S. N	Comparison Between	Error obtained
1	Serial and p=4 (2*2)	0e0
2	Serial and p=8 (2*4)	0e0
3	Serial and p=16 (4*4)	0e0

Table 1 suggests there is no error when code is run either serial or parallel.

Q.N.1 (c)

Table 2. Time vs Number of Processors (p) for different scenarios

S. N	Algorithm	Number of processors(p)	Execution time(s)
1	Serial	1	26.14005657797679
2	p = 4 (2*2)	4	7.269733611028641
3	p = 8 (2*4)	8	3.979599676036742
4	p=16 (4*4)	16	2.185076688008849

Table 2 suggests that the execution time has been reduced by an great amount when increasing the number of processors.