POISSON\_SERIAL:

C++ version

A program for solving the Poisson equation.

-DEL^2 U = F(X,Y)

on the square -1<= X <= 1, -1<= Y <= 1.

F(X,Y) = 2\*pi^2 \*sin(pi\*x)\*cos(pi\*y)

The number of interior X grid points is 5

The number of interior Y grid points is 5

The X grid spacing is 0.5

The Y grid spacing is 0.5

RMS of F = 5.5974

RMS of exact solution = 0.489898

Step ||Unew|| ||Unew-U|| ||Unew-Exact||

0 0.4 0.282843

1 0.540149 0.362989 0.639651

2 0.59798 0.128336 0.703542

3 0.631464 0.0453737 0.748875

4 0.640361 0.016042 0.758042

5 0.644665 0.00567171 0.763704

6 0.645799 0.00200525 0.764865

7 0.646339 0.000708964 0.765573

8 0.646481 0.000250657 0.765718

9 0.646548 8.86205e-005 0.765807

10 0.646566 3.13321e-005 0.765825

11 0.646574 1.10776e-005 0.765836

12 0.646576 3.91651e-006 0.765838

13 0.646578 1.38469e-006 0.76584

14 0.646578 4.89564e-007 0.76584

The iteration has converged.

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Step ||Unew|| ||Unew-U|| ||Unew-Exact||

0 0 1

1 0.540149 1.2337 0.639651

2 0.59798 0.308425 0.703542

3 0.631464 0.154213 0.748875

4 0.640361 0.0385531 0.758042

5 0.644665 0.0192766 0.763704

6 0.645799 0.00481914 0.764865

7 0.646339 0.00240957 0.765573

8 0.646481 0.000602393 0.765718

9 0.646548 0.000301196 0.765807

10 0.646566 7.52991e-005 0.765825

11 0.646574 3.76496e-005 0.765836

12 0.646576 9.41239e-006 0.765838

13 0.646578 4.70619e-006 0.76584

14 0.646578 1.17655e-006 0.76584

15 0.646578 1e-006 0.76584

The iteration has converged.