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Professor Cline

CS 3513

25 October 2012

Iterative Solving Methods

File S2.txt

**GUASS SIEDEL TOL .00000001 ITER 11**

sol [1,1.75236034393311,2.62850499153137,3.62848722934723,4.72136098146439,5.860

68049073219,7,]

**JACOBI TOL .00000001 ITER 11**

sol [1,1.369140625,2.0517578125,2.734375,4.0498046875,5.365234375,7,]

**SOR TOL .000000001 ITER 11 W 1.67**

**sol [1.0122130132905,1.39868994285536,3.25569231839025,3.62715317061279,5.188286**

**84001838,5.74385127319683,7.08549109303348,]**

RESIDUAL VECTOR N Iterations

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Iterative Methods   |  |  |  |  | | --- | --- | --- | --- | | Jacobi | Guass Siedel | SOR | CG | | 0: 7.14142842861286  1: 3.67423461431085  2: 2.85043856292326  3: 2.40442300791687  4: 2.10839097441627  5: 1.88383335940311  6: 1.70376994698521  7: 1.55721763373412  8: 1.43810491722723  9: 1.3420029753556  10: 1.26518562170619 | 0: 7.07693491657935  1: 3.67396881804949  2: 2.25045856487532  3: 1.70530631019641  4: 1.45859575045238  5: 1.30220749746487  6: 1.18579175621413  7: 1.10968369510666  8: 1.06335783585534  9: 1.03616743422582  10: 1.02051180560112 | **0: 12.1525821663074**  **1: 17.9518371989342**  **2: 17.695650812255**  **3: 16.0006336169718**  **4: 13.852000993956**  **5: 10.870010794166**  **6: 7.69767862331477**  **7: 5.8808759021357**  **8: 4.52384146957544**  **9: 3.61225784601133**  **10: 2.90192039944461** |  | | X VALUES | X VALUES | X VALUES | X VALUES | | 1  1.369140625  2.0517578125  2.734375  4.0498046875  5.365234375  7 | 1,  1.75236034393311,  2.62850499153137,  3.62848722934723,  4.72136098146439,  5.86068049073219,  7 | **1.0122130132905**  **1.39868994285536**  **3.25569231839025**  **3.62715317061279**  **5.18828684001838**  **5.74385127319683**  **7.08549109303348** |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |  |  |  |  | |
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Guass Siedel converges best with the specified number of iterations. However SOR could potentially converge the fasted with a good ‘W’ value and given tolerance and n iterations. Jacobi does the worst merely because it doesn’t update and track its x values per iteration