HW 5

(MATH/CS 375)

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Problem 1:

Matrix A is not strictly diagonally dominant because |a22| > |a21| + |a23| => |2| > |-1| + |-1| => 2 > 2, is false.

Problem 2:

eigen\_j = eig(Bj);  
eigen\_gs = eig(Bgs);

spectral\_j = max(abs(ej));  
spectral\_gs = max(abs(egs));

Jacobi: 0.900969   
Gauss-Seidel: 0.811745

Since the spectral radius of Bj is 0.900969 < 1. We can conclude that Jacobi method will converge.  
Similarly, the spectral radius of Bgs is 0.811745 < 1. We can also conclude that Gauss-Seidel method will converge.

Problem 3:

Jacobi:

x =  
 3.4269  
 6.8540  
 8.2820  
 6.7103  
 6.1399  
 3.5697  
  
Iterations = 73

Gauss-Seidel:  
  
x =   
 3.4275  
 6.8553   
 8.2837  
 6.7125  
 6.1415  
 3.5708  
  
Iterations = 40