COLBY COLLEGE
Department of Mathematics
and Computer Science

MA332 **Allen B. Downey**
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Assignment 6: Iterative solution of linear systems

Reading: Faires and Burden Chapter 7.
Due: Thursday 29 October

Jacobi and Gauss-Seidel

1. Solve exercise 7.4.1(a) on page 308, using two iterations of Jacobi, *followed by* two iterations of Gauss-Seidel.
2. Convert this system into the matrix form $\mathbf{x_{new}} = \mathbf{T} \cdot \mathbf{x_{old}} + \mathbf{c}$, and use matrix operations (in Maple) to perform two more iterations of Jacobi iteration, starting from your solution to the previous question.
3. Use the `eigenvalues` command in Maple (it's in the linalg package) to find the spectral radius of T.
4. Based on the spectral radius, will Jacobi's method converge? What test can we use to determine if Gauss-Seidel will converge? Apply that test and interpret the results.

Iterative refinement

1. Use iterative refinement to improve your answer to the previous problem.

Word problem!

THIS PROBLEM HAS BEEN CANCELLED. YOU CAN DO IT FOR FUN IF YOU WANT, BUT IT IS NO LONGER REQUIRED.

1. Solve exercise 7.5.5 on page 313, using any *one* of the three techniques.