1. Do the following problems from the text: 9.8, 9.10 on page 272.

2. Write a program in a language of your choice to implement Naive Gaussian Elimination. Below is the framework for a VBA implementation (available for download on the web site). You may use this, or you may write the equivalent in another language.

Option Explicit
Sub Gauss()
    ' Declarations
    Dim A() As Variant, b() As Variant, x() As Variant
    Dim nrows As Integer, ncols As Integer, n As Integer
    Dim rng1 As Range, rng2 As Range, rng3 As Range
    Dim i As Integer, j As Integer, k As Integer
    Dim factor As Double, sum As Double
    ' Get input ranges, check for correct shape, and set arrays
    Call GetRange(rng1, "Enter n by n input range for matrix of coefficients")
    Call GetRange(rng2, "Enter n by 1 input range for RHS")
    Call GetRange(rng3, "Enter n by 1 output range for solution")
    ncols = rng1.Columns.Count
    nrows = rng1.Rows.Count
    If (nrows <> ncols) Then
        MsgBox "Matrix not square"
        Exit Sub
    End If
    n = nrows
Sub GetRange(rng As Range, msg As String)
    Dim srng As String
    srng = InputBox(msg)
    Set rng = Range(srng)
End Sub

3. Use your program to solve the linear system \( Ax = b \), where

\[
A = \begin{bmatrix}
1 & 1/2 & 1/3 & 1/4 & 1/5 \\
1/2 & 1/3 & 1/4 & 1/5 & 1/6 \\
1/3 & 1/4 & 1/5 & 1/6 & 1/7 \\
1/4 & 1/5 & 1/6 & 1/7 & 1/8 \\
1/5 & 1/6 & 1/7 & 1/8 & 1/9
\end{bmatrix}
\]

and

\[
b = \begin{bmatrix}
2 \\
-4 \\
3 \\
7 \\
-1
\end{bmatrix}
\]

4. Do the following problems from the text: 10.2–10.4, 10.20 on pages 293–294.
5. Use Matlab to solve the linear system \( Ax = b \), where

\[
A = \begin{bmatrix}
1 & 1/2 & 1/3 & 1/4 & 1/5 \\
1/2 & 1/3 & 1/4 & 1/5 & 1/6 \\
1/3 & 1/4 & 1/5 & 1/6 & 1/7 \\
1/4 & 1/5 & 1/6 & 1/7 & 1/8 \\
1/5 & 1/6 & 1/7 & 1/8 & 1/9 \\
\end{bmatrix}
\]

and

\[
b = \begin{bmatrix}
2 \\
-4 \\
3 \\
7 \\
-1 \\
\end{bmatrix}
\]

You can use the backslash operator.

6. Do problem 11.9 on page 313 of the text. Also show that the criterion for Gauss-Seidel to work is satisfied.