PIVOTING ALGORITHM

At each step of gaussian elimination, put the largest element in the column on the diagonal.

DO  L = 1,M-1  ! which step of the elimination you are on

  c --- Find pivot element and location ---
  pivot = 0  ! initialize pivot element
  ipivot = 0  ! initialize pivot row location
  DO I = L , M  ! find pivot element
    IF ( | a(I,L) | > pivot) THEN
      pivot = a(I,L)  ! store new pivot element
      ipivot = I  ! store location of new pivot element
    ENDIF
  ENDDO

  c --- Exchange Lth row and pivot row to put pivot element on top ---
  DO J = L , N  ! for each non-zero element in the row
    holder = a(L,J)  ! hold the value currently in the top row
    a(L,J) = a(ipivot,J)  ! move the element in ipivot row to top row
    a(ipivot,J) = holder  ! put top row element into ipivot row
  ENDDO

ENDDO

SCALING ALGORITHM (One of many methods)

Before your start elimination, find the magnitude of each vector (row in the array), and make it a unit vector. This makes all the vectors the same size.

DO I = 1 , M  ! for Each row

  C – Find length of each vector (matrix row)
  DO J = 1 , N
    vector_length = vector_length +  a(I ,J )^2
  ENDDO
  vector_length = sqrt(vector_length)

  --Scale each vector to a unit length (=1.0) --
  DO J = 1 , N
    a(I , J ) = a(I , J ) / vector_length
  ENDDO

ENDDO