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
```