<u>Steps to reduce a matrix to Row Echelon Form:</u>

1. Find if there is any element $= 1$ in the first column; if it occurs in row i

   then $R_i \leftrightarrow R_1$. If not, look at any non-zero element in the first column and

   if it is in row i then $R_i \leftrightarrow R_1$.

2. If all elements in the first column are zeros, move to the second column

   and apply step 1 as above.

3. If a_{11} now is 1, go to the next step. If $a_{11} \neq 1$ then divide R_1 by a_{11}.

4. Try to make all entries under $1 = a_{11}$ to be zeros.

5. Ignore R_1 and repeat the same steps for the matrix obtained by deleting

   R_1 till you have some thing like:

$$\begin{bmatrix} 1 & * & * & * & * & * \\ 0 & 1 & * & * & * & * \\ 0 & 0 & 0 & 1 & * & * \\ 0 & 0 & 0 & 0 & 1 & * \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

Now the matrix is in Row Echelon Form.

If the matrix to be reduced to Reduced Row Echelon Form then

6. In each column containing a leading entry 1, all the other entries

   must be zeros.

Example:

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 3 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$
R R E F