Instructions for using the file reduce.

Say you want to solve

\[
\begin{bmatrix}
1 & 2 & 3 \\
0 & 1 & 2 \\
1 & 1 & 1 \\
\end{bmatrix}
\begin{bmatrix}
x_1 \\
x_2 \\
x_3 \\
\end{bmatrix}
=
\begin{bmatrix}
b_1 \\
b_2 \\
b_3 \\
\end{bmatrix}.
\]

(1)

Start up Maple. At the prompt type

\texttt{read reduce;}

(assuming the file reduce sits in the current directory.)

Then type

\texttt{A := array([[1, 2, 3], [0, 1, 2], [1, 1, 1]]);}

Note the brackets!

Then type

\texttt{main(A, 3, 3, B);}

This will leave A untouched but will write to B. To see the answer (i.e B) type

\texttt{op(B);}

and you will see the 3 by 6 matrix

\[
\begin{bmatrix}
1 & 0 & -1 & 1 & -2 & 0 \\
0 & 1 & 2 & 0 & 1 & 0 \\
0 & 0 & 0 & -1 & 1 & 1 \\
\end{bmatrix}.
\]

The point is that (1) is equivalent to

\[
\begin{bmatrix}
1 & 0 & -1 \\
0 & 1 & 2 \\
0 & 0 & 0 \\
\end{bmatrix}
\begin{bmatrix}
x_1 \\
x_2 \\
x_3 \\
\end{bmatrix}
=
\begin{bmatrix}
1 & -2 & 0 \\
0 & 1 & 0 \\
-1 & 1 & 1 \\
\end{bmatrix}
\begin{bmatrix}
b_1 \\
b_2 \\
b_3 \\
\end{bmatrix}.
\]

This is a good thing.