Algorithm: $[A,b] := GAUSSJORDAN_PART1(A,b)$

Partition
$$A \to \begin{pmatrix} A_{TL} & A_{TR} \\ A_{BL} & A_{BR} \end{pmatrix}$$
, $b \to \begin{pmatrix} b_T \\ b_B \end{pmatrix}$

where A_{TL} is 0×0 , b_T has 0 rows

while $m(A_{TL}) < m(A)$ do

Repartition

$$\left(\begin{array}{c|cc}
A_{TL} & A_{TR} \\
\hline
A_{BL} & A_{BR}
\end{array}\right) \rightarrow \left(\begin{array}{c|cc}
A_{00} & a_{01} & A_{02} \\
\hline
a_{10}^T & \alpha_{11} & a_{12}^T \\
\hline
A_{20} & a_{21} & A_{22}
\end{array}\right), \left(\begin{array}{c}
b_T \\
\hline
b_B
\end{array}\right) \rightarrow \left(\begin{array}{c}
b_0 \\
\hline
\beta_1 \\
\hline
b_2
\end{array}\right)$$

$$a_{01} := a_{01}/\alpha_{11}$$
 (= u_0

$$\begin{aligned} a_{01} &:= a_{01}/\alpha_{11} & & (=u_{01}) \\ a_{21} &:= a_{21}/\alpha_{11} & & (=l_{21}) \end{aligned}$$

$$A_{02} := A_{02} - a_{01} a_{12}^T \qquad (= A_{02} - u_{01} a_{12}^T)$$

$$A_{22} := A_{22} - a_{21} a_{12}^T \qquad (= A_{22} - l_{21} a_{12}^T)$$

$$A_{22} := A_{22} - a_{21}a_{12}^T \qquad (= A_{22} - l_{21}a_{12}^T)$$

$$b_0 := b_0 - \beta_1 a_{01}$$
 $(= b_2 - \beta_1 u_{01})$

$$b_2 := b_2 - \beta_1 a_{21}$$
 $(= b_2 - \beta_1 l_{21})$

 $a_{01} := 0$ (zero vector)

 $a_{21} := 0$ (zero vector)

Continue with

$$\left(\begin{array}{c|c|c} A_{TL} & A_{TR} \\ \hline A_{BL} & A_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c|c|c} A_{00} & a_{01} & A_{02} \\ \hline a_{10}^T & \alpha_{11} & a_{12}^T \\ \hline A_{20} & a_{21} & A_{22} \end{array}\right), \left(\begin{array}{c|c|c} b_T \\ \hline b_B \end{array}\right) \leftarrow \left(\begin{array}{c|c|c} b_0 \\ \hline \beta_1 \\ \hline b_2 \end{array}\right)$$

endwhile

Algorithm: $[A,b] := GAUSSJORDAN_PART2(A,b)$

Partition
$$A \to \begin{pmatrix} A_{TL} & A_{TR} \\ \hline A_{BL} & A_{BR} \end{pmatrix}$$
, $b \to \begin{pmatrix} b_T \\ \hline b_B \end{pmatrix}$

where A_{TL} is 0×0 , b_T has 0 rows

while $m(A_{TL}) < m(A)$ do

Repartition

$$\begin{pmatrix}
A_{TL} & A_{TR} \\
A_{BL} & A_{BR}
\end{pmatrix} \rightarrow
\begin{pmatrix}
A_{00} & a_{01} & A_{02} \\
\hline
a_{10}^T & \alpha_{11} & a_{12}^T \\
\hline
A_{20} & a_{21} & A_{22}
\end{pmatrix},
\begin{pmatrix}
b_T \\
b_B
\end{pmatrix} \rightarrow
\begin{pmatrix}
b_0 \\
\hline
\beta_1 \\
\hline
b_2
\end{pmatrix}$$

$$\beta_1 := \beta_1/\alpha_{11}$$

$$\alpha_{11} := 1$$

Continue with

$$\begin{pmatrix} A_{TL} & A_{TR} \\ \hline A_{BL} & A_{BR} \end{pmatrix} \leftarrow \begin{pmatrix} A_{00} & a_{01} & A_{02} \\ \hline a_{10}^T & \alpha_{11} & a_{12}^T \\ \hline A_{20} & a_{21} & A_{22} \end{pmatrix}, \begin{pmatrix} b_T \\ \hline b_B \end{pmatrix} \leftarrow \begin{pmatrix} b_0 \\ \hline \beta_1 \\ \hline b_2 \end{pmatrix}$$

endwhile