Algorithm: $B := Gussjordan_mrhs_alt_unb(A, B)$

Partition
$$A \to \begin{pmatrix} A_{TL} & A_{TR} \\ A_{BL} & A_{BR} \end{pmatrix}, \quad B \to \begin{pmatrix} B_T \\ B_B \end{pmatrix}$$

where A_{TL} is $0 \times 0, B_T$ has 0 rows

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

Repartition

$$\left(\begin{array}{c|c|c}
A_{TL} & A_{TR} \\
\hline
A_{BL} & A_{BR}
\end{array}\right) \to \left(\begin{array}{c|c|c}
A_{00} & A_{01} & A_{02} \\
\hline
A_{10}^T & \alpha_{11} & A_{12}^T \\
\hline
A_{20} & A_{21} & A_{22}
\end{array}\right), \quad \left(\begin{array}{c|c|c}
B_T \\
\hline
B_B
\end{array}\right) \to \left(\begin{array}{c|c|c}
B_0 \\
\hline
B_1 \\
\hline
B_2
\end{array}\right)$$

$$\begin{aligned} a_{01} &:= a_{01}/\alpha_{11}, & a_{21} &:= a_{21}/\alpha_{11} \\ A_{02} &:= A_{02} - a_{01}a_{12}^T, & A_{22} &:= A_{22} - a_{21}a_{12}^T \\ B_0 &:= B_0 - a_{01}b_1^T, & B_2 &:= B_2 - a_{21}b_1^T \\ a_{01} &:= 0, & a_{21} &:= 0 \end{aligned}$$

$$a_{01} := 0,$$
 $a_{21} := 0$

$$a_{12}^T:=a_{12}^T/\alpha_{11}$$
 (extra vs Gaussjordan_mrhs)
$$b_1^T:=b_1^T/\alpha_{11}$$

$$\alpha_{11}:=0$$

Continue with

$$\left(\begin{array}{c|c|c}
A_{TL} & A_{TR} \\
\hline
A_{BL} & A_{BR}
\end{array}\right) \leftarrow \left(\begin{array}{c|c|c}
A_{00} & A_{01} & A_{02} \\
\hline
A_{10}^T & \alpha_{11} & A_{12}^T \\
\hline
A_{20} & A_{21} & A_{22}
\end{array}\right), \quad \left(\begin{array}{c|c|c}
B_T \\
\hline
B_B
\end{array}\right) \leftarrow \left(\begin{array}{c|c|c}
B_0 \\
\hline
B_1 \\
\hline
B_2
\end{array}\right)$$

endwhile