

Algorithm: $B := \text{GUSSJORDAN_MRHS_ALT_UNB}(A, B)$

Partition $A \rightarrow \left(\begin{array}{c|c} A_{TL} & A_{TR} \\ \hline A_{BL} & A_{BR} \end{array} \right), \quad B \rightarrow \left(\begin{array}{c} B_T \\ \hline B_B \end{array} \right)$

where A_{TL} is 0×0 , B_T has 0 rows

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

Repartition

$$\left(\begin{array}{c|c} A_{TL} & A_{TR} \\ \hline A_{BL} & A_{BR} \end{array} \right) \rightarrow \left(\begin{array}{c|c|c} A_{00} & a_{01} & A_{02} \\ \hline a_{10}^T & \alpha_{11} & a_{12}^T \\ \hline A_{20} & a_{21} & A_{22} \end{array} \right), \quad \left(\begin{array}{c} B_T \\ \hline B_B \end{array} \right) \rightarrow \left(\begin{array}{c} B_0 \\ \hline \frac{b_1}{B_2} \end{array} \right)$$

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

$$\begin{aligned} a_{12}^T &:= a_{12}^T/\alpha_{11} & (\text{extra vs Gaussjordan_mrhs}) \\ b_1^T &:= b_1^T/\alpha_{11} \\ \alpha_{11} &:= 0 \end{aligned}$$

Continue with

$$\left(\begin{array}{c|c} A_{TL} & A_{TR} \\ \hline A_{BL} & A_{BR} \end{array} \right) \leftarrow \left(\begin{array}{c|c|c} A_{00} & a_{01} & A_{02} \\ \hline a_{10}^T & \alpha_{11} & a_{12}^T \\ \hline A_{20} & a_{21} & A_{22} \end{array} \right), \quad \left(\begin{array}{c} B_T \\ \hline B_B \end{array} \right) \leftarrow \left(\begin{array}{c} B_0 \\ \hline \frac{b_1}{B_2} \end{array} \right)$$

endwhile