Step	Algorithm:		
1a			
4			
	where		
2			
3	while do		
2,3		٨	
5a			
	where		
6			
8			
5b			
7			
2			
	endwhile		
2,3		^ ¬()
1b			

Step	Algorithm: $[C] := \text{SYMM_LU_UNB_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A \to \begin{pmatrix} A_{TL} & A_{TR} \\ 0 & A_{BR} \end{pmatrix}, B \to \begin{pmatrix} B_T \\ B_B \end{pmatrix}, C \to \begin{pmatrix} C_T \\ C_B \end{pmatrix}$ where A_{TL} is 0×0 , B_T has 0 rows, C_T has 0 rows
2	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^T B_T + \widehat{C}_B}\right) $
3	while $m(A_{TL}) < m(A)$ do
2,3	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) \wedge m(A_{TL}) < m(A) $
5a	$ \left(\begin{array}{c c} A_{TL} & A_{TR} \\ \hline 0 & A_{BR} \end{array}\right) \to \left(\begin{array}{c c} A_{00} & a_{01} & A_{02} \\ \hline 0 & \alpha_{11} & a_{12}^T \\ \hline 0 & 0 & A_{22} \end{array}\right), \left(\begin{array}{c} B_T \\ B_B \end{array}\right) \to \left(\begin{array}{c} B_0 \\ \hline b_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c} C_T \\ C_B \end{array}\right) \to \left(\begin{array}{c} C_0 \\ \hline c_1^T \\ C_2 \end{array}\right) $ where $a_1 > a_1 > a_2 > a_2 > a_3 > a_4 > a$
6	where α_{11} is 1×1 , b_1 has 1 row, c_1 has 1 row $ \left(\frac{B_0}{b_1^T}\right) = \left(\frac{A_{00}B_0 + a_{01}b_1^T + A_{02}B_2 + \widehat{C}_0}{a_{01}^TB_0 + \widehat{C}_1^T}\right) $ $ \frac{A_{00}B_0 + a_{01}b_1^T + A_{02}B_2 + \widehat{C}_0}{A_{02}^TB_0 + \widehat{C}_2} $
8	$c_1^T := a_{11}b_1 + a_{12}^T B_2 + c_1^T$ $c_2 := a_{12}^{TT} b_1^T + C_2$
5b	$ \left(\begin{array}{c c} A_{TL} & A_{TR} \\ \hline 0 & A_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c c} A_{00} & a_{01} & A_{02} \\ \hline 0 & \alpha_{11} & a_{12}^T \\ \hline 0 & 0 & A_{22} \end{array}\right), \left(\begin{array}{c} B_T \\ B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ \hline b_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c} C_T \\ C_B \end{array}\right) \leftarrow \left(\begin{array}{c} C_0 \\ \hline c_1^T \\ C_2 \end{array}\right) $
7	$ \left(\frac{B_0}{b_1^T}\right) = \left(\frac{A_{00}B_0 + a_{01}b_1^T + A_{02}B_2 + \widehat{C}_0}{a_{01}^TB_0 + \alpha_{11}b_1 + \alpha_{12}^TB_2 + \widehat{c}^T} - \frac{A_{02}^TB_0 + a_{12}^Tb_1^T + \widehat{C}_2}{A_{02}^TB_0 + a_{12}^{TT}b_1^T + \widehat{C}_2}\right) $
2	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) $
	endwhile
2,3	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C_T}}{A_{TR}^TB_T + \widehat{C_B}}\right) \wedge \neg (m(A_{TL}) < m(A))$
1b	$[C] = \operatorname{symm} \operatorname{lu}(A, B, \widehat{C})$

 $\textbf{Algorithm:} \ [C] := \texttt{SYMM_LU_UNB_VAR1}(A, B, C)$

$$A \to \left(\begin{array}{c|c} A_{TL} & A_{TR} \\ \hline 0 & A_{BR} \end{array}\right) , B \to \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) , C \to \left(\begin{array}{c} C_T \\ \hline C_B \end{array}\right)$$

where A_{TL} is 0×0 , B_T has 0 rows, C_T has 0 rows

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

$$\left(\begin{array}{c|c}
A_{TL} & A_{TR} \\
\hline
0 & A_{BR}
\end{array}\right) \to \left(\begin{array}{c|c}
A_{00} & a_{01} & A_{02} \\
\hline
0 & \alpha_{11} & a_{12}^T \\
\hline
0 & 0 & A_{22}
\end{array}\right), \left(\begin{array}{c}
B_T \\
\hline
B_B
\end{array}\right) \to \left(\begin{array}{c}
B_0 \\
\hline
b_1^T \\
B_2
\end{array}\right), \left(\begin{array}{c}
C_T \\
C_B
\end{array}\right) \to \left(\begin{array}{c}
C_0 \\
\hline
c_1^T \\
C_2
\end{array}\right)$$

where α_{11} is 1×1 , b_1 has 1 row, c_1 has 1 row

$$c_1^T := a_{11}b_1 + a_{12}^T B_2 + c_1^T$$

$$c_2 := a_{12}^{TT} b_1^T + C_2$$

$$\left(\begin{array}{c|c}
A_{TL} & A_{TR} \\
\hline
0 & A_{BR}
\end{array}\right) \leftarrow \left(\begin{array}{c|c}
A_{00} & a_{01} & A_{02} \\
\hline
0 & \alpha_{11} & a_{12}^T \\
\hline
0 & 0 & A_{22}
\end{array}\right), \left(\begin{array}{c}
B_T \\
\hline
B_B
\end{array}\right) \leftarrow \left(\begin{array}{c}
B_0 \\
\hline
b_1^T \\
B_2
\end{array}\right), \left(\begin{array}{c}
C_T \\
C_B
\end{array}\right) \leftarrow \left(\begin{array}{c}
C_0 \\
\hline
c_1^T \\
C_2
\end{array}\right)$$

endwhile

Step	Algorithm: $[C] := \text{SYMM_LU_UNB_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	
1	
	where
2	
3	while do
2,3	^
5a	
	1
	where
6	
8	
5b	
7	
2	
	endwhile
2,3	$\wedge \neg (\hspace{1cm})$
1b	$[C] = \operatorname{symm} \operatorname{lu}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYMM_LU_UNB_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	
2	where $ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) $
3	while do
2,3	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C_T}}{A_{TR}^TB_T + \widehat{C_B}}\right) \wedge$
5a	where
	where
6	
8	
5b	
7	
2	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right)$
	endwhile
2	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C_T}}{A_{TR}^T B_T + \widehat{C_B}}\right) \land \neg ($
1b	$[C] = \operatorname{symm_lu}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYMM_LU_UNB_VAR1}(A, B, C)$
1a	$C = \hat{C}$
4	
2	where $ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) $
3	while $m(A_{TL}) < m(A)$ do
2,3	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^T B_T + \widehat{C}_B}\right) \wedge m(A_{TL}) < m(A) $
5a	
6	where
8	
5b	
7	
2	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^T B_T + \widehat{C}_B}\right) $
	endwhile
2,3	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C_T}}{A_{TR}^TB_T + \widehat{C_B}}\right) \wedge \neg (m(A_{TL}) < m(A))$
1b	$[C] = \operatorname{symm_lu}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYMM_LU_UNB_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A \to \begin{pmatrix} A_{TL} & A_{TR} \\ 0 & A_{BR} \end{pmatrix}, B \to \begin{pmatrix} B_T \\ B_B \end{pmatrix}, C \to \begin{pmatrix} C_T \\ C_B \end{pmatrix}$ where A_{TL} is 0×0 , B_T has 0 rows, C_T has 0 rows
2	where A_{TL} is 0×0 , B_T has 0 rows, C_T has 0 rows $ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) $
3	while $m(A_{TL}) < m(A)$ do
2,3	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C_T}}{A_{TR}^T B_T + \widehat{C_B}}\right) \wedge m(A_{TL}) < m(A)$
5a	
	where
6	
8	
5b	
7	
2	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^T B_T + \widehat{C}_B}\right) $
	endwhile
2,3	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) \land \neg (m(A_{TL}) < m(A)) $
1b	$[C] = \operatorname{symm_lu}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYMM_LU_UNB_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A \to \begin{pmatrix} A_{TL} & A_{TR} \\ 0 & A_{BR} \end{pmatrix}, B \to \begin{pmatrix} B_T \\ B_B \end{pmatrix}, C \to \begin{pmatrix} C_T \\ C_B \end{pmatrix}$ where A_{TL} is 0×0 , B_T has 0 rows, C_T has 0 rows
2	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) $
3	while $m(A_{TL}) < m(A)$ do
2,3	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) \wedge m(A_{TL}) < m(A) $
5a	$ \begin{pmatrix} A_{TL} A_{TR} \\ 0 A_{BR} \end{pmatrix} \rightarrow \begin{pmatrix} A_{00} a_{01} A_{02} \\ 0 \alpha_{11} a_{12}^T \\ 0 0 A_{22} \end{pmatrix}, \begin{pmatrix} B_T \\ B_B \end{pmatrix} \rightarrow \begin{pmatrix} B_0 \\ b_1^T \\ B_2 \end{pmatrix}, \begin{pmatrix} C_T \\ C_B \end{pmatrix} \rightarrow \begin{pmatrix} C_0 \\ c_1^T \\ C_2 \end{pmatrix} $ where α_{11} is 1×1 , b_1 has 1 row, c_1 has 1 row
6	
8	
5b	$ \left(\begin{array}{c c} A_{TL} & A_{TR} \\ \hline 0 & A_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c c} A_{00} & a_{01} & A_{02} \\ \hline 0 & \alpha_{11} & a_{12}^T \\ \hline 0 & 0 & A_{22} \end{array}\right), \left(\begin{array}{c} B_T \\ B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ \hline b_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c} C_T \\ C_B \end{array}\right) \leftarrow \left(\begin{array}{c} C_0 \\ \hline c_1^T \\ C_2 \end{array}\right) $
7	
2	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right)$
	endwhile
2,3	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C_T}}{A_{TR}^TB_T + \widehat{C_B}}\right) \land \neg (m(A_{TL}) < m(A))$
1b	$[C] = \operatorname{symm_lu}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYMM_LU_UNB_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A \to \begin{pmatrix} A_{TL} & A_{TR} \\ 0 & A_{BR} \end{pmatrix}, B \to \begin{pmatrix} B_T \\ B_B \end{pmatrix}, C \to \begin{pmatrix} C_T \\ C_B \end{pmatrix}$ where A_{TL} is 0×0 , B_T has 0 rows, C_T has 0 rows
2	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) $
3	while $m(A_{TL}) < m(A)$ do
2,3	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) \wedge m(A_{TL}) < m(A) $
5a	$ \left(\begin{array}{c c} A_{TL} & A_{TR} \\ \hline 0 & A_{BR} \end{array}\right) \rightarrow \left(\begin{array}{c c} A_{00} & a_{01} & A_{02} \\ \hline 0 & \alpha_{11} & a_{12}^T \\ \hline 0 & 0 & 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 b_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c} C_T \\ C_B \end{array}\right) \rightarrow \left(\begin{array}{c} C_0 \\ \hline c_1^T \\ C_2 \end{array}\right) $ where α_{11} is 1×1 , b_1 has 1 row, c_1 has 1 row
6	$ \frac{\left(\frac{B_0}{b_1^T}\right)}{\left(\frac{B_2}{B_2}\right)} = \left(\frac{\frac{A_{00}B_0 + a_{01}b_1^T + A_{02}B_2 + \widehat{C}_0}{a_{01}^TB_0 + \widehat{c}^T}}{A_{02}^TB_0 + \widehat{C}_2}\right) $
8	
5b	$ \left(\begin{array}{c c} A_{TL} & A_{TR} \\ \hline 0 & A_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c c} A_{00} & a_{01} & A_{02} \\ \hline 0 & \alpha_{11} & a_{12}^T \\ \hline 0 & 0 & A_{22} \end{array}\right), \left(\begin{array}{c} B_T \\ B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ \hline b_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c} C_T \\ C_B \end{array}\right) \leftarrow \left(\begin{array}{c} C_0 \\ \hline c_1^T \\ C_2 \end{array}\right) $
7	
2	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right)$
	endwhile
2,3	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C_T}}{A_{TR}^TB_T + \widehat{C_B}}\right) \land \neg (m(A_{TL}) < m(A)) $
1b	$[C] = \operatorname{symm} \operatorname{lu}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYMM_LU_UNB_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A \to \begin{pmatrix} A_{TL} & A_{TR} \\ 0 & A_{BR} \end{pmatrix}, B \to \begin{pmatrix} B_T \\ B_B \end{pmatrix}, C \to \begin{pmatrix} C_T \\ C_B \end{pmatrix}$ where A_{TL} is 0×0 , B_T has 0 rows, C_T has 0 rows
2	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) $
3	while $m(A_{TL}) < m(A)$ do
2,3	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^T B_T + \widehat{C}_B}\right) \wedge m(A_{TL}) < m(A)$
5a	$ \left(\begin{array}{c c} A_{TL} & A_{TR} \\ \hline 0 & A_{BR} \end{array}\right) \rightarrow \left(\begin{array}{c c} A_{00} & a_{01} & A_{02} \\ \hline 0 & \alpha_{11} & a_{12}^T \\ \hline 0 & 0 & A_{22} \end{array}\right), \left(\begin{array}{c}B_T \\ B_B \end{array}\right) \rightarrow \left(\begin{array}{c}B_0 \\ \hline b_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c}C_T \\ C_B \end{array}\right) \rightarrow \left(\begin{array}{c}C_0 \\ \hline c_1^T \\ C_2 \end{array}\right) $
6	where α_{11} is 1×1 , b_1 has 1 row, c_1 has 1 row $ \left(\frac{B_0}{b_1^T}\right) = \left(\frac{A_{00}B_0 + a_{01}b_1^T + A_{02}B_2 + \widehat{C}_0}{a_{01}^TB_0 + \widehat{C}^T}\right) $ $ A_{02}^TB_0 + \widehat{C}_2 $
8	
5b	$ \left(\begin{array}{c c} A_{TL} & A_{TR} \\ \hline 0 & A_{11} & a_{12}^T \\ \hline 0 & 0 & A_{22} \end{array}\right), \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ \hline B_1^T \\ \hline B_2 \end{array}\right), \left(\begin{array}{c} C_T \\ \hline C_B \end{array}\right) \leftarrow \left(\begin{array}{c} C_0 \\ \hline C_1^T \\ \hline C_2 \end{array}\right) $
7	$ \left(\frac{B_0}{b_1^T}\right) = \left(\frac{A_{00}B_0 + a_{01}b_1^T + A_{02}B_2 + \widehat{C}_0}{a_{01}^TB_0 + \alpha_{11}b_1 + \alpha_{12}^TB_2 + \widehat{c}^T} - A_{02}^TB_0 + a_{12}^Tb_1^T + \widehat{C}_2}\right) $
2	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^T B_T + \widehat{C}_B}\right) $
	endwhile
2	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C_T}}{A_{TR}^TB_T + \widehat{C_B}}\right) \wedge \neg (m(A_{TL}) < m(A))$
1b	$[C] = \operatorname{symm_lu}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYMM_LU_UNB_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A \to \begin{pmatrix} A_{TL} & A_{TR} \\ 0 & A_{BR} \end{pmatrix}, B \to \begin{pmatrix} B_T \\ B_B \end{pmatrix}, C \to \begin{pmatrix} C_T \\ C_B \end{pmatrix}$ where A_{TL} is 0×0 , B_T has 0 rows, C_T has 0 rows
2	$ \left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) $
3	while $m(A_{TL}) < m(A)$ do
2,3	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C}_T}{A_{TR}^TB_T + \widehat{C}_B}\right) \wedge m(A_{TL}) < m(A)$
5a	$ \left(\begin{array}{c c} A_{TL} & A_{TR} \\ \hline 0 & A_{11} & a_{12}^T \\ \hline 0 & 0 & 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 b_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c} C_T \\ \hline C_B \end{array}\right) \rightarrow \left(\begin{array}{c} C_0 \\ \hline c_1^T \\ \hline C_2 \end{array}\right) $ where α_{11} is 1×1 , b_1 has 1 row, c_1 has 1 row
6	where α_{11} is 1×1 , b_1 has 1 row, c_1 has 1 row $ \left(\frac{B_0}{b_1^T}\right) = \left(\frac{A_{00}B_0 + a_{01}b_1^T + A_{02}B_2 + \widehat{C}_0}{a_{01}^TB_0 + \widehat{C}^T}\right) $ $ \frac{A_{00}B_0 + a_{01}b_1^T + A_{02}B_2 + \widehat{C}_0}{A_{02}^TB_0 + \widehat{C}_2} $
8	$c_1^T := a_{11}b_1 + a_{12}^T B_2 + c_1^T$ $c_2 := a_{12}^{TT} b_1^T + C_2$
5b	$ \left(\begin{array}{c c} A_{TL} & A_{TR} \\ \hline 0 & A_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c c} A_{00} & a_{01} & A_{02} \\ \hline 0 & \alpha_{11} & a_{12}^T \\ \hline 0 & 0 & A_{22} \end{array}\right), \left(\begin{array}{c} B_T \\ B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ \hline b_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c} C_T \\ C_B \end{array}\right) \leftarrow \left(\begin{array}{c} C_0 \\ \hline c_1^T \\ C_2 \end{array}\right) $
7	$ \left(\frac{B_0}{b_1^T}\right) = \left(\frac{A_{00}B_0 + a_{01}b_1^T + A_{02}B_2 + \widehat{C_0}}{a_{01}^TB_0 + \alpha_{11}b_1 + \alpha_{12}^TB_2 + \widehat{c^T}} - \frac{A_{02}^TB_0 + a_{12}^Tb_1^T + \widehat{C_2}}{A_{02}^TB_0 + a_{12}^{TT}b_1^T + \widehat{C_2}}\right) $
2	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C_T}}{A_{TR}^T B_T + \widehat{C_B}}\right)$
	endwhile
2,3	$\left(\frac{C_T}{C_B}\right) = \left(\frac{A_{TL}B_T + A_{TR}B_B + \widehat{C_T}}{A_{TR}^TB_T + \widehat{C_B}}\right) \wedge \neg (m(A_{TL}) < m(A))$
1b	$[C] = \operatorname{symm} \operatorname{lu}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYMM_LU_UNB_VAR1}(A, B, C)$
	$A \to \begin{pmatrix} A_{TL} & A_{TR} \\ 0 & A_{BR} \end{pmatrix}, B \to \begin{pmatrix} B_T \\ B_B \end{pmatrix}, C \to \begin{pmatrix} C_T \\ C_B \end{pmatrix}$ where A_{TL} is 0×0 , B_T has 0 rows, C_T has 0 rows
	while $m(A_{TL}) < m(A)$ do
	$ \begin{pmatrix} A_{TL} A_{TR} \\ 0 A_{BR} \end{pmatrix} \rightarrow \begin{pmatrix} A_{00} a_{01} A_{02} \\ \hline 0 \alpha_{11} a_{12}^T \\ \hline 0 0 A_{22} \end{pmatrix}, \begin{pmatrix} B_T \\ B_B \end{pmatrix} \rightarrow \begin{pmatrix} B_0 \\ \overline{b_1}^T \\ B_2 \end{pmatrix}, \begin{pmatrix} C_T \\ C_B \end{pmatrix} \rightarrow \begin{pmatrix} C_0 \\ \overline{c_1}^T \\ C_2 \end{pmatrix} $ where α_{11} is 1×1 , b_1 has 1 row, c_1 has 1 row
	$c_1^T := a_{11}b_1 + a_{12}^T B_2 + c_1^T$ $c_2 := a_{12}^{TT} b_1^T + C_2$
	$ \left(\begin{array}{c c} A_{TL} & A_{TR} \\ \hline 0 & A_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c c} A_{00} & a_{01} & A_{02} \\ \hline 0 & \alpha_{11} & a_{12}^T \\ \hline 0 & 0 & A_{22} \end{array}\right), \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ \hline B_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c} C_T \\ C_B \end{array}\right) \leftarrow \left(\begin{array}{c} C_0 \\ \hline C_1^T \\ C_2 \end{array}\right) $
	endwhile

 $\textbf{Algorithm:} \ [C] := \texttt{SYMM_LU_UNB_VAR1}(A, B, C)$

$$A \to \left(\begin{array}{c|c} A_{TL} & A_{TR} \\ \hline 0 & A_{BR} \end{array}\right) , B \to \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) , C \to \left(\begin{array}{c} C_T \\ \hline C_B \end{array}\right)$$

where A_{TL} is 0×0 , B_T has 0 rows, C_T has 0 rows

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

$$\left(\begin{array}{c|c}
A_{TL} & A_{TR} \\
\hline
0 & A_{BR}
\end{array}\right) \to \left(\begin{array}{c|c}
A_{00} & a_{01} & A_{02} \\
\hline
0 & \alpha_{11} & a_{12}^T \\
\hline
0 & 0 & A_{22}
\end{array}\right), \left(\begin{array}{c}
B_T \\
\hline
B_B
\end{array}\right) \to \left(\begin{array}{c}
B_0 \\
\hline
b_1^T \\
B_2
\end{array}\right), \left(\begin{array}{c}
C_T \\
C_B
\end{array}\right) \to \left(\begin{array}{c}
C_0 \\
\hline
c_1^T \\
C_2
\end{array}\right)$$

where α_{11} is 1×1 , b_1 has 1 row, c_1 has 1 row

$$c_1^T := a_{11}b_1 + a_{12}^T B_2 + c_1^T$$

$$c_2 := a_{12}^{TT} b_1^T + C_2$$

$$\left(\begin{array}{c|c}
A_{TL} & A_{TR} \\
\hline
0 & A_{BR}
\end{array}\right) \leftarrow \left(\begin{array}{c|c}
A_{00} & a_{01} & A_{02} \\
\hline
0 & \alpha_{11} & a_{12}^T \\
\hline
0 & 0 & A_{22}
\end{array}\right), \left(\begin{array}{c}
B_T \\
\hline
B_B
\end{array}\right) \leftarrow \left(\begin{array}{c}
B_0 \\
\hline
b_1^T \\
B_2
\end{array}\right), \left(\begin{array}{c}
C_T \\
C_B
\end{array}\right) \leftarrow \left(\begin{array}{c}
C_0 \\
\hline
c_1^T \\
C_2
\end{array}\right)$$

endwhile