

Step	Algorithm: Solve $Lx = y$ overwriting y with x . L is unit lower triangular.
1a	$\{y = \hat{y}$ }
4	$L \rightarrow \left(\begin{array}{c c} L_{TL} & L_{TR} \\ \hline L_{BL} & L_{BR} \end{array} \right), x \rightarrow \left(\begin{array}{c} x_T \\ x_B \end{array} \right), y \rightarrow \left(\begin{array}{c} y_T \\ y_B \end{array} \right)$ <p style="text-align: center;">where L_{TL} is 0×0, x_T has 0 rows, y_T has 0 rows</p>
2	$\left\{ \left(\begin{array}{c} y_T \\ y_B \end{array} \right) = \left(\begin{array}{c} x_T \\ \hat{y}_B - L_{BL}x_T \end{array} \right) \wedge L_{TL}x_T = y_T \right\}$
3	while $m(L_{TL}) < m(L)$ do
2,3	$\left\{ \left(\begin{array}{c} y_T \\ y_B \end{array} \right) = \left(\begin{array}{c} x_T \\ \hat{y}_B - L_{BL}x_T \end{array} \right) \wedge L_{TL}x_T = y_T \wedge m(L_{TL}) < m(L) \right\}$
5a	$\left(\begin{array}{c c} L_{TL} & L_{TR} \\ \hline L_{BL} & L_{BR} \end{array} \right) \rightarrow \left(\begin{array}{c c c} L_{00} & l_{01} & L_{02} \\ \hline l_{10}^T & \lambda_{11} & l_{12}^T \\ \hline L_{20} & l_{21} & L_{22} \end{array} \right), \left(\begin{array}{c} x_T \\ x_B \end{array} \right) \rightarrow \left(\begin{array}{c} x_0 \\ \chi_1 \\ x_2 \end{array} \right), \left(\begin{array}{c} y_T \\ y_B \end{array} \right) \rightarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ y_2 \end{array} \right)$ <p style="text-align: center;">where λ_{11} is 1×1, χ_1 has 1 row, ψ_1 has 1 row</p>
6	$\left\{ \left(\begin{array}{c} y_0 \\ \psi_1 \\ y_2 \end{array} \right) = \left(\begin{array}{c} x_0 \\ \hat{\psi}_1 - l_{10}^T x_0 \\ \hat{y}_2 - L_{20}^T x_0 \end{array} \right) \wedge L_{00}x_0 = \hat{y}_0 \right\}$
8	$y_2 := \hat{y}_2 - L_{00}x_0 - \chi_1 l_{21} = y_2 - \psi_1 l_{21}$
7	$\left\{ \left(\begin{array}{c} y_0 \\ \psi_1 \\ y_2 \end{array} \right) = \left(\begin{array}{c} x_0 \\ \chi_1 \\ \hat{y}_2 - L_{00}x_0 - \chi_1 l_{21} \end{array} \right) \wedge \begin{array}{l} L_{00}x_0 = \hat{y}_0 \\ l_{10}^T x_0 + \chi_1 = \hat{\psi}_1 \end{array} \right\}$
5b	$\left(\begin{array}{c c} L_{TL} & L_{TR} \\ \hline L_{BL} & L_{BR} \end{array} \right) \leftarrow \left(\begin{array}{c c c} L_{00} & l_{01} & L_{02} \\ \hline l_{10}^T & \lambda_{11} & l_{12}^T \\ \hline L_{20} & l_{21} & L_{22} \end{array} \right), \left(\begin{array}{c} x_T \\ x_B \end{array} \right) \leftarrow \left(\begin{array}{c} x_0 \\ \chi_1 \\ x_2 \end{array} \right), \left(\begin{array}{c} y_T \\ y_B \end{array} \right) \leftarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ y_2 \end{array} \right)$
2	$\left\{ \left(\begin{array}{c} y_T \\ y_B \end{array} \right) = \left(\begin{array}{c} x_T \\ \hat{y}_B - L_{BL}x_T \end{array} \right) \wedge L_{TL}x_T = y_T \right\}$
	endwhile
2,3	$\left\{ \left(\begin{array}{c} y_T \\ y_B \end{array} \right) = \left(\begin{array}{c} x_T \\ \hat{y}_B - L_{BL}x_T \end{array} \right) \wedge L_{TL}x_T = y_T \wedge \neg(m(L_{TL}) < m(L)) \right\}$
1b	$\{y = x \wedge Lx = \hat{y}$ }

Step	Algorithm: Solve $Lx = y$ overwriting y with x . L is unit lower triangular.
1a	{
4	
	where
2	{
3	while do
2,3	{
	\wedge
5a	
	where
6	{
8	
7	{
5b	
2	{
	endwhile
2,3	{
	$\wedge \neg($
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2	$\left\{ \left(\frac{y_T}{y_B} \right) = \left(\frac{x_T}{\hat{y}_B - L_{BL}x_T} \right) \wedge L_{TL}x_T = y_T \right\}$
3	while do
2,3	$\left\{ \left(\frac{y_T}{y_B} \right) = \left(\frac{x_T}{\hat{y}_B - L_{BL}x_T} \right) \wedge L_{TL}x_T = y_T \wedge \right\}$
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2	$\left\{ \left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right) = \left(\begin{array}{c} x_T \\ \hline \hat{y}_B - L_{BL}x_T \end{array} \right) \wedge L_{TL}x_T = y_T \right\}$
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5b	$\left(\begin{array}{c c} L_{TL} & L_{TR} \\ \hline L_{BL} & L_{BR} \end{array} \right) \leftarrow \left(\begin{array}{c c c} L_{00} & l_{01} & L_{02} \\ \hline l_{10}^T & \lambda_{11} & l_{12}^T \\ \hline L_{20} & l_{21} & L_{22} \end{array} \right), \left(\begin{array}{c} x_T \\ x_B \end{array} \right) \leftarrow \left(\begin{array}{c} x_0 \\ \chi_1 \\ x_2 \end{array} \right), \left(\begin{array}{c} y_T \\ y_B \end{array} \right) \leftarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ y_2 \end{array} \right)$
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	while $m(L_{TL}) < m(L)$ do
	$\left(\begin{array}{c c} L_{TL} & L_{TR} \\ \hline L_{BL} & L_{BR} \end{array} \right) \rightarrow \left(\begin{array}{c c c} L_{00} & l_{01} & L_{02} \\ \hline l_{10}^T & \lambda_{11} & l_{12}^T \\ \hline L_{20} & l_{21} & L_{22} \end{array} \right), \left(\begin{array}{c} x_T \\ \hline x_B \end{array} \right) \rightarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array} \right), \left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right) \rightarrow \left(\begin{array}{c} y_0 \\ \hline \psi_1 \\ \hline y_2 \end{array} \right)$ <p>where λ_{11} is 1×1, χ_1 has 1 row, ψ_1 has 1 row</p>
	$y_2 := \widehat{y}_2 - L_{00}x_0 - \chi_1 l_{21} = y_2 - \psi_1 l_{21}$
	$\left(\begin{array}{c c} L_{TL} & L_{TR} \\ \hline L_{BL} & L_{BR} \end{array} \right) \leftarrow \left(\begin{array}{c c c} L_{00} & l_{01} & L_{02} \\ \hline l_{10}^T & \lambda_{11} & l_{12}^T \\ \hline L_{20} & l_{21} & L_{22} \end{array} \right), \left(\begin{array}{c} x_T \\ \hline x_B \end{array} \right) \leftarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array} \right), \left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right) \leftarrow \left(\begin{array}{c} y_0 \\ \hline \psi_1 \\ \hline y_2 \end{array} \right)$
	endwhile

Algorithm: Solve $Lx = y$ overwriting y with x . L is unit lower triangular.

$$L \rightarrow \left(\begin{array}{c|c} L_{TL} & L_{TR} \\ \hline L_{BL} & L_{BR} \end{array} \right), x \rightarrow \left(\begin{array}{c} x_T \\ x_B \end{array} \right), y \rightarrow \left(\begin{array}{c} y_T \\ y_B \end{array} \right)$$

where L_{TL} is 0×0 , x_T has 0 rows, y_T has 0 rows

while $m(L_{TL}) < m(L)$ **do**

$$\left(\begin{array}{c|c} L_{TL} & L_{TR} \\ \hline L_{BL} & L_{BR} \end{array} \right) \rightarrow \left(\begin{array}{c|c} L_{00} & l_{01} \ L_{02} \\ \hline l_{10}^T & \lambda_{11} \ l_{12}^T \\ L_{20} & l_{21} \ L_{22} \end{array} \right), \left(\begin{array}{c} x_T \\ x_B \end{array} \right) \rightarrow \left(\begin{array}{c} x_0 \\ \chi_1 \\ x_2 \end{array} \right), \left(\begin{array}{c} y_T \\ y_B \end{array} \right) \rightarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ y_2 \end{array} \right)$$

where λ_{11} is 1×1 , χ_1 has 1 row, ψ_1 has 1 row

$$y_2 := \hat{y}_2 - L_{00}x_0 - \chi_1 l_{21} = y_2 - \psi_1 l_{21}$$

$$\left(\begin{array}{c|c} L_{TL} & L_{TR} \\ \hline L_{BL} & L_{BR} \end{array} \right) \leftarrow \left(\begin{array}{c|c} L_{00} \ l_{01} & L_{02} \\ \hline l_{10}^T \ \lambda_{11} & l_{12}^T \\ L_{20} \ l_{21} & L_{22} \end{array} \right), \left(\begin{array}{c} x_T \\ x_B \end{array} \right) \leftarrow \left(\begin{array}{c} x_0 \\ \chi_1 \\ x_2 \end{array} \right), \left(\begin{array}{c} y_T \\ y_B \end{array} \right) \leftarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ y_2 \end{array} \right)$$

endwhile