<table>
<tr><th>Step</th><th>Algorithm: $C = AB^T + BA^T + C$</th></tr>
<tr><td>1a</td><td>$\{C = \widehat{C} \qquad \}$</td></tr>
<tr><td>4</td><td>$A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right)$, $B \rightarrow \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right)$, $C \rightarrow \left(\begin{array}{c|c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right)$
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<tr><td>3</td><td>while $m(C_{TL}) < m(C)$ do</td></tr>
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<tr><td>6</td><td>$\left\{ \left(\begin{array}{ccc} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ C_{20} & C_{21} & C_{22} \end{array}\right) = \left(\begin{array}{ccc} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & \widehat{C}_{01} & \widehat{C}_{02} \\ A_1^T B_0^T + \widehat{C}_{10}^T & \widehat{C}_{11} & \widehat{C}_{12}^T \\ A_2 B_0^T + \widehat{C}_{20} & \widehat{C}_{21} & \widehat{C}_{22} \end{array}\right) \right\}$</td></tr>
<tr><td>8</td><td>$C_{01} = A_0(B_1^T)^T + B_0(A_1^T)^T + C_{01}^T$
$C_{11} = A_1^T(B_1^T)^T + B_1^T(A_1^T)^T + C_{11}$
$C_{10}^T = B_1^T A_0^T + C_{10}^T$
$C_{20} = A_2(B_1^T)^T + C_{20}^T$
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<tr><td>7</td><td>$\left\{ \left(\begin{array}{ccc} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ C_{20} & C_{21} & C_{22} \end{array}\right) = \left(\begin{array}{ccc} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & A_0(B_1^T)^T + B_0(A_1^T)^T + \widehat{c}_{01} & \widehat{C}_{02} \\ A_1 B_0^T + B_1^T A_0^T + \widehat{C}_{10}^T & A_1^T(b_1^T)^T + B_1^T(A_1^T)^T + \widehat{C}_{11} & \widehat{C}_{12}^T \\ A_2(b_1^T)^T + A_2 B_0^T + \widehat{C}_{20} & A_2 B_0^T + A_1^T B_0^T + \widehat{C}_{21} & \widehat{C}_{22} \end{array}\right) \right\}$</td></tr>
<tr><td>5b</td><td>$\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ A_1^T \\ \hline A_2 \end{array}\right)$, $\left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ B_1^T \\ \hline B_2 \end{array}\right)$, $\left(\begin{array}{c|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{cc|c} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right)$</td></tr>
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Step	Algorithm: $C = AB^T + BA^T + C$
1a	$\{ \quad \}$
4	where
2	$\left\{ \quad \right\}$
3	while do
2,3	$\left\{ \quad \wedge \quad \right\}$
5a	**Determine block size** b where
6	$\left\{ \quad \right\}$
8	
7	$\left\{ \quad \right\}$
5b	
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Step	Algorithm: $C = AB^T + BA^T + C$
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6	$\left\{ \begin{pmatrix} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ C_{20} & C_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & \widehat{C}_{01} & \widehat{C}_{02} \\ A_1^T B_0^T + \widehat{C}_{10}^T & \widehat{C}_{11} & \widehat{C}_{12}^T \\ A_2 B_0^T + \widehat{C}_{20} & \widehat{C}_{21} & \widehat{C}_{22} \end{pmatrix} \right\}$
8	
7	$\left\{ \begin{pmatrix} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ C_{20} & C_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & A_0 (B_1^T)^T + B_0 (A_1^T)^T + \widehat{c}_{01} & \widehat{C}_{02} \\ A_1 B_0^T + B_1^T A_0^T + \widehat{C}_{10}^T & A_1^T (b_1^T)^T + B_1^T (A_1^T)^T + \widehat{C}_{11} & \widehat{C}_{12}^T \\ A_2 (b_1^T)^T + A_2 B_0^T + \widehat{C}_{20} & A_2 B_0^T + A_1^T B_0^T + \widehat{C}_{21} & \widehat{C}_{22} \end{pmatrix} \right\}$
5b	$\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ A_1^T \\ \hline A_2 \end{array}\right)$, $\left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ B_1^T \\ \hline B_2 \end{array}\right)$, $\left(\begin{array}{c\|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{cc\|c} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right)$
2	$\left\{ \left(\begin{array}{c\|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) = \left(\begin{array}{c\|c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline A_B B_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array}\right) \right\}$
	endwhile
2,3	$\left\{ \left(\begin{array}{c\|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) = \left(\begin{array}{c\|c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline A_B B_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array}\right) \wedge \neg (m(C_{TL}) < m(C)) \right\}$
1b	$\{ C = AB^T + BA^T + \widehat{C} \}$

<table>
<tr><th>Step</th><th>Algorithm: $C = AB^T + BA^T + C$</th></tr>
<tr><td>1a</td><td>$\{C = \widehat{C}\}$</td></tr>
<tr><td>4</td><td>$A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right), B \rightarrow \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right), C \rightarrow \left(\begin{array}{c|c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right)$
where A_T has 0 rows, B_T has 0 rows, C_{TL} is 0×0</td></tr>
<tr><td>2</td><td>$\left\{ \left(\begin{array}{c|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) = \left(\begin{array}{c|c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline A_B B_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array}\right) \right\}$</td></tr>
<tr><td>3</td><td>while $m(C_{TL}) < m(C)$ do</td></tr>
<tr><td>2,3</td><td>$\left\{ \left(\begin{array}{c|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) = \left(\begin{array}{c|c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline A_B B_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array}\right) \wedge m(C_{TL}) < m(C) \right\}$</td></tr>
<tr><td>5a</td><td>Determine block size b
$\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline A_1^T \\ A_2 \end{array}\right), \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \rightarrow \left(\begin{array}{c} B_0 \\ \hline B_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c|c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right) \rightarrow \left(\begin{array}{c|cc} C_{00} & C_{01} & C_{02} \\ \hline C_{10}^T & C_{11} & C_{12}^T \\ C_{20} & C_{21} & C_{22} \end{array}\right)$
where A_1 has b rows, B_1 has b rows, C_{11} is $b \times b$</td></tr>
<tr><td>6</td><td>$\left\{ \begin{pmatrix} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ C_{20} & C_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & \widehat{C}_{01} & \widehat{C}_{02} \\ A_1^T B_0^T + \widehat{C}_{10}^T & \widehat{C}_{11} & \widehat{C}_{12}^T \\ A_2 B_0^T + \widehat{C}_{20} & \widehat{C}_{21} & \widehat{C}_{22} \end{pmatrix} \right\}$</td></tr>
<tr><td>8</td><td>$C_{01} = A_0(B_1^T)^T + B_0(A_1^T)^T + C_{01}^T$
$C_{11} = A_1^T(B_1^T)^T + B_1^T(A_1^T)^T + C_{11}$
$C_{10}^T = B_1^T A_0^T + C_{10}^T$
$C_{20} = A_2(B_1^T)^T + C_{20}^T$
$C_{21} = A_2 B_0^T + A_1^T B_0^T + C_{20}^T$</td></tr>
<tr><td>7</td><td>$\left\{ \begin{pmatrix} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ C_{20} & C_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & A_0(B_1^T)^T + B_0(A_1^T)^T + \widehat{c}_{01} & \widehat{C}_{02} \\ A_1 B_0^T + B_1^T A_0^T + \widehat{C}_{10}^T & A_1^T(b_1^T)^T + B_1^T(A_1^T)^T + \widehat{C}_{11} & \widehat{C}_{12}^T \\ A_2(b_1^T)^T + A_2 B_0^T + \widehat{C}_{20} & A_2 B_0^T + A_1^T B_0^T + \widehat{C}_{21} & \widehat{C}_{22} \end{pmatrix} \right\}$</td></tr>
<tr><td>5b</td><td>$\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ A_1^T \\ \hline A_2 \end{array}\right), \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ B_1^T \\ \hline B_2 \end{array}\right), \left(\begin{array}{c|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{cc|c} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right)$</td></tr>
<tr><td>2</td><td>$\left\{ \left(\begin{array}{c|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) = \left(\begin{array}{c|c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline A_B B_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array}\right) \right\}$</td></tr>
<tr><td></td><td>endwhile</td></tr>
<tr><td>2,3</td><td>$\left\{ \left(\begin{array}{c|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) = \left(\begin{array}{c|c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline A_B B_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array}\right) \wedge \neg(m(C_{TL}) < m(C)) \right\}$</td></tr>
<tr><td>1b</td><td>$\{C = AB^T + BA^T + \widehat{C}\}$</td></tr>
</table>

	Algorithm: $C = AB^T + BA^T + C$
	$A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right)$, $B \rightarrow \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right)$, $C \rightarrow \left(\begin{array}{c\|c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right)$ where A_T has 0 rows, B_T has 0 rows, C_{TL} is 0×0
	while $m(C_{TL}) < m(C)$ do
	Determine block size b $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline A_1^T \\ A_2 \end{array}\right)$, $\left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \rightarrow \left(\begin{array}{c} B_0 \\ \hline B_1^T \\ B_2 \end{array}\right)$, $\left(\begin{array}{c\|c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right) \rightarrow \left(\begin{array}{c\|cc} C_{00} & C_{01} & C_{02} \\ \hline C_{10}^T & C_{11} & C_{12}^T \\ C_{20} & C_{21} & C_{22} \end{array}\right)$ where A_1 has b rows, B_1 has b rows, C_{11} is $b \times b$
	$C_{01} = A_0(B_1^T)^T + B_0(A_1^T)^T + C_{01}^T$ $C_{11} = A_1^T(B_1^T)^T + B_1^T(A_1^T)^T + C_{11}$ $C_{10}^T = B_1^T A_0^T + C_{10}^T$ $C_{20} = A_2(B_1^T)^T + C_{20}^T$ $C_{21} = A_2 B_0^T + A_1^T B_0^T + C_{20}^T$
	$\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ A_1^T \\ \hline A_2 \end{array}\right)$, $\left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ B_1^T \\ \hline B_2 \end{array}\right)$, $\left(\begin{array}{c\|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{cc\|c} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right)$
	endwhile

Algorithm: $C = AB^T + BA^T + C$

$$A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right), B \rightarrow \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right), C \rightarrow \left(\begin{array}{c|c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right)$$

where A_T has 0 rows, B_T has 0 rows, C_{TL} is 0×0

while $m(C_{TL}) < m(C)$ do

Determine block size b

$$\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline A_1^T \\ A_2 \end{array}\right), \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \rightarrow \left(\begin{array}{c} B_0 \\ \hline B_1^T \\ B_2 \end{array}\right), \left(\begin{array}{c|c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right) \rightarrow \left(\begin{array}{c|cc} C_{00} & C_{01} & C_{02} \\ \hline C_{10}^T & C_{11} & C_{12}^T \\ C_{20} & C_{21} & C_{22} \end{array}\right)$$

where A_1 has b rows, B_1 has b rows, C_{11} is $b \times b$

$C_{01} = A_0(B_1^T)^T + B_0(A_1^T)^T + C_{01}^T$

$C_{11} = A_1^T(B_1^T)^T + B_1^T(A_1^T)^T + C_{11}$

$C_{10}^T = B_1^T A_0^T + C_{10}^T$

$C_{20} = A_2(B_1^T)^T + C_{20}^T$

$C_{21} = A_2 B_0^T + A_1^T B_0^T + C_{20}^T$

$$\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ A_1^T \\ \hline A_2 \end{array}\right), \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ B_1^T \\ \hline B_2 \end{array}\right), \left(\begin{array}{c|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{cc|c} C_{00} & C_{01} & C_{02} \\ C_{10}^T & C_{11} & C_{12}^T \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right)$$

endwhile