Step	Algorithm: $A := xy^T + A$
1a	$\left\{ A = \widehat{A} \right\}$
4	$y \rightarrow \left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right)$, $A \rightarrow \left(A_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} A_R \right)$ where y_B has 0 rows, A_R has 0 columns
2	$\left\{ \left(A_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} A_R \right) = \left(\widehat{A}_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} xy_B^T + \widehat{A}_R \right) \right\}$
3	while $m(y_B) < m(y)$ do
2,3	$\left\{ \left(A_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} A_R \right) = \left(\widehat{A}_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} xy_B^T + \widehat{A}_R \right) \wedge m(y_B) < m(y) \right\}$
5a	$\left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right) \rightarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ \hline y_2 \end{array} \right)$, $\left(A_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} A_R \right) \rightarrow \left(A_0 \;\; a_1 \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} A_2 \right)$ where ψ_1 has 1 row, a_1 has 1 column
6	$\left\{ \left(A_0 \;\; a_1 \;\; A_2 \right) = \left(\widehat{A}_0 \;\; \widehat{a}_1 \;\; xy_2^T + \widehat{A}_2 \right) \right\}$
8	$a_1 := \psi_1 x + a_1$
7	$\left\{ \left(A_0 \;\; a_1 \;\; A_2 \right) = \left(\widehat{A}_0 \;\; \psi_1 x + \widehat{a}_1 \;\; xy_2^T + \widehat{A}_2 \right) \right\}$
5b	$\left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right) \leftarrow \left(\begin{array}{c} y_0 \\ \hline \psi_1 \\ y_2 \end{array} \right)$, $A \rightarrow \left(A_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} A_R \right) \leftarrow \left(A_0 \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} a_1 \;\; A_2 \right)$
2	$\left\{ \left(A_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} A_R \right) = \left(\widehat{A}_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} xy_B^T + \widehat{A}_R \right) \right\}$
	endwhile
2,3	$\left\{ \left(A_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} A_R \right) = \left(\widehat{A}_L \mathbin{\rule[-0.4ex]{0.1em}{2.2ex}} xy_B^T + \widehat{A}_R \right) \wedge \neg (m(y_B) < m(y)) \right\}$
1b	$\left\{ A := xy^T + \widehat{A} \right\}$

Step	Algorithm: $A := xy^T + A$
1a	$\{ \qquad \}$
4	where
2	$\left\{ \qquad \right\}$
3	while do
2,3	$\left\{ \qquad \wedge \qquad \right\}$
5a	where
6	$\left\{ \qquad \right\}$
8	
7	$\left\{ \qquad \right\}$
5b	
2	$\left\{ \qquad \right\}$
	endwhile
2,3	$\left\{ \qquad \wedge \neg(\qquad) \qquad \right\}$
1b	$\{ \qquad \}$

Step	Algorithm: $A := xy^T + A$
1a	$\{ A = \widehat{A} \qquad \}$
4	where
2	$\left\{ \qquad \right\}$
3	while do
2,3	$\left\{ \qquad \wedge \qquad \right\}$
5a	where
6	$\left\{ \qquad \right\}$
8	
7	$\left\{ \qquad \right\}$
5b	
2	$\left\{ \qquad \right\}$
	endwhile
2,3	$\left\{ \qquad \wedge \neg(\qquad) \qquad \right\}$
1b	$\{ A := xy^T + \widehat{A} \qquad \}$

Step	Algorithm: $A := xy^T + A$
1a	$\{ A = \widehat{A} \qquad \}$
4	where
2	$\left\{ \left(A_L \,\middle|\, A_R \right) = \left(\widehat{A}_L \,\middle|\, xy_B^T + \widehat{A}_R \right) \right\}$
3	while do
2,3	$\left\{ \left(A_L \,\middle|\, A_R \right) = \left(\widehat{A}_L \,\middle|\, xy_B^T + \widehat{A}_R \right) \wedge \right\}$
5a	where
6	$\{ \qquad \}$
8	
7	$\{ \qquad \}$
5b	
2	$\left\{ \left(A_L \,\middle|\, A_R \right) = \left(\widehat{A}_L \,\middle|\, xy_B^T + \widehat{A}_R \right) \right\}$
	endwhile
2,3	$\left\{ \left(A_L \,\middle|\, A_R \right) = \left(\widehat{A}_L \,\middle|\, xy_B^T + \widehat{A}_R \right) \wedge \neg(\qquad) \right\}$
1b	$\{ A := xy^T + \widehat{A} \qquad \}$

Step	Algorithm: $A := xy^T + A$
1a	$\{ A = \widehat{A} \}$
4	where
2	$\left\{ \left(A_L \middle| A_R \right) = \left(\widehat{A}_L \middle| xy_B^T + \widehat{A}_R \right) \right\}$
3	while $m(y_B) < m(y)$ do
2,3	$\left\{ \left(A_L \middle| A_R \right) = \left(\widehat{A}_L \middle| xy_B^T + \widehat{A}_R \right) \wedge m(y_B) < m(y) \right\}$
5a	where
6	$\{ \}$
8	
7	$\{ \}$
5b	
2	$\left\{ \left(A_L \middle| A_R \right) = \left(\widehat{A}_L \middle| xy_B^T + \widehat{A}_R \right) \right\}$
	endwhile
2,3	$\left\{ \left(A_L \middle| A_R \right) = \left(\widehat{A}_L \middle| xy_B^T + \widehat{A}_R \right) \wedge \neg(m(y_B) < m(y)) \right\}$
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Step	Algorithm: $A := xy^T + A$
1a	$\{ A = \widehat{A} \}$
4	$y \rightarrow \left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right)$, $A \rightarrow \left(A_L \,\middle\|\, A_R \right)$ where y_B has 0 rows, A_R has 0 columns
2	$\left\{ \left(A_L \,\middle\|\, A_R \right) = \left(\widehat{A}_L \,\middle\|\, xy_B^T + \widehat{A}_R \right) \right\}$
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5a	where
6	$\{ \}$
8	
7	$\{ \}$
5b	
2	$\left\{ \left(A_L \,\middle\|\, A_R \right) = \left(\widehat{A}_L \,\middle\|\, xy_B^T + \widehat{A}_R \right) \right\}$
	endwhile
2,3	$\left\{ \left(A_L \,\middle\|\, A_R \right) = \left(\widehat{A}_L \,\middle\|\, xy_B^T + \widehat{A}_R \right) \wedge \neg(m(y_B) < m(y)) \right\}$
1b	$\{ A := xy^T + \widehat{A} \}$

Step	Algorithm: $A := xy^T + A$
1a	$\{ A = \widehat{A} \}$
4	$y \rightarrow \left(\frac{y_T}{y_B} \right)$, $A \rightarrow \left(A_L \,\middle|\, A_R \right)$ where y_B has 0 rows, A_R has 0 columns
2	$\left\{ \left(A_L \,\middle|\, A_R \right) = \left(\widehat{A}_L \,\middle|\, xy_B^T + \widehat{A}_R \right) \right\}$
3	while $m(y_B) < m(y)$ do
2,3	$\left\{ \left(A_L \,\middle|\, A_R \right) = \left(\widehat{A}_L \,\middle|\, xy_B^T + \widehat{A}_R \right) \wedge m(y_B) < m(y) \right\}$
5a	$\left(\frac{y_T}{y_B} \right) \rightarrow \begin{pmatrix} y_0 \\ \psi_1 \\ \hline y_2 \end{pmatrix}$, $\left(A_L \,\middle|\, A_R \right) \rightarrow \left(A_0 \;\; a_1 \,\middle|\, A_2 \right)$ where ψ_1 has 1 row, a_1 has 1 column
6	$\{ \}$
8	
7	$\{ \}$
5b	$\left(\frac{y_T}{y_B} \right) \leftarrow \begin{pmatrix} y_0 \\ \hline \psi_1 \\ y_2 \end{pmatrix}$, $A \rightarrow \left(A_L \,\middle|\, A_R \right) \leftarrow \left(A_0 \,\middle|\, a_1 \;\; A_2 \right)$
2	$\left\{ \left(A_L \,\middle|\, A_R \right) = \left(\widehat{A}_L \,\middle|\, xy_B^T + \widehat{A}_R \right) \right\}$
	endwhile
2,3	$\left\{ \left(A_L \,\middle|\, A_R \right) = \left(\widehat{A}_L \,\middle|\, xy_B^T + \widehat{A}_R \right) \wedge \neg (m(y_B) < m(y)) \right\}$
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3	while $m(y_B) < m(y)$ do
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5a	$\left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right) \rightarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ \hline y_2 \end{array} \right)$, $\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \rightarrow \left(\begin{array}{cc\|c} A_0 & a_1 & A_2 \end{array} \right)$ where ψ_1 has 1 row, a_1 has 1 column
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8	
7	$\{ \}$
5b	$\left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right) \leftarrow \left(\begin{array}{c} y_0 \\ \hline \psi_1 \\ y_2 \end{array} \right)$, $A \rightarrow \left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \leftarrow \left(\begin{array}{c\|cc} A_0 & a_1 & A_2 \end{array} \right)$
2	$\left\{ \left(\begin{array}{c\|c} A_L & A_R \end{array} \right) = \left(\begin{array}{c\|c} \widehat{A}_L & xy_B^T + \widehat{A}_R \end{array} \right) \right\}$
	endwhile
2,3	$\left\{ \left(\begin{array}{c\|c} A_L & A_R \end{array} \right) = \left(\begin{array}{c\|c} \widehat{A}_L & xy_B^T + \widehat{A}_R \end{array} \right) \wedge \neg(m(y_B) < m(y)) \right\}$
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5a	$\left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right) \rightarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ \hline y_2 \end{array} \right)$, $\left(A_L \,\middle\|\, A_R \right) \rightarrow \left(A_0 \;\; a_1 \,\middle\|\, A_2 \right)$ where ψ_1 has 1 row, a_1 has 1 column
6	$\left\{ \left(A_0 \;\; a_1 \;\; A_2 \right) = \left(\widehat{A}_0 \;\; \widehat{a}_1 \;\; xy_2^T + \widehat{A}_2 \right) \right\}$
8	
7	$\left\{ \left(A_0 \;\; a_1 \;\; A_2 \right) = \left(\widehat{A}_0 \;\; \psi_1 x + \widehat{a}_1 \;\; xy_2^T + \widehat{A}_2 \right) \right\}$
5b	$\left(\begin{array}{c} y_T \\ \hline y_B \end{array} \right) \leftarrow \left(\begin{array}{c} y_0 \\ \hline \psi_1 \\ y_2 \end{array} \right)$, $A \rightarrow \left(A_L \,\middle\|\, A_R \right) \leftarrow \left(A_0 \,\middle\|\, a_1 \;\; A_2 \right)$
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5a	$\left(\begin{array}{c} y_T \\ \hline y_B \end{array}\right) \rightarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ \hline y_2 \end{array}\right)$, $\left(\begin{array}{c\|c} A_L & A_R \end{array}\right) \rightarrow \left(\begin{array}{cc\|c} A_0 & a_1 & A_2 \end{array}\right)$ where ψ_1 has 1 row, a_1 has 1 column
6	$\left\{ \left(\begin{array}{ccc} A_0 & a_1 & A_2 \end{array}\right) = \left(\begin{array}{ccc} \widehat{A}_0 & \widehat{a}_1 & xy_2^T + \widehat{A}_2 \end{array}\right) \right\}$
8	$a_1 := \psi_1 x + a_1$
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5b	$\left(\begin{array}{c} y_T \\ \hline y_B \end{array}\right) \leftarrow \left(\begin{array}{c} y_0 \\ \hline \psi_1 \\ y_2 \end{array}\right)$, $A \rightarrow \left(\begin{array}{c\|c} A_L & A_R \end{array}\right) \leftarrow \left(\begin{array}{c\|cc} A_0 & a_1 & A_2 \end{array}\right)$
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	Algorithm: $A := xy^T + A$
	$y \rightarrow \left(\begin{array}{c} y_T \\ \hline y_B \end{array}\right)$, $A \rightarrow \left(\begin{array}{c\|c} A_L & A_R \end{array}\right)$ where y_B has 0 rows, A_R has 0 columns
	while $m(y_B) < m(y)$ do
	$\left(\begin{array}{c} y_T \\ \hline y_B \end{array}\right) \rightarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ \hline y_2 \end{array}\right)$, $\left(\begin{array}{c\|c} A_L & A_R \end{array}\right) \rightarrow \left(\begin{array}{cc\|c} A_0 & a_1 & A_2 \end{array}\right)$ where ψ_1 has 1 row, a_1 has 1 column
	$a_1 := \psi_1 x + a_1$
	$\left(\begin{array}{c} y_T \\ \hline y_B \end{array}\right) \leftarrow \left(\begin{array}{c} y_0 \\ \hline \psi_1 \\ y_2 \end{array}\right)$, $A \rightarrow \left(\begin{array}{c\|c} A_L & A_R \end{array}\right) \leftarrow \left(\begin{array}{c\|cc} A_0 & a_1 & A_2 \end{array}\right)$
	endwhile

Algorithm: $A := xy^T + A$

$y \rightarrow \left(\begin{array}{c} y_T \\ \hline y_B \end{array}\right)$, $A \rightarrow \left(\begin{array}{c|c} A_L & A_R \end{array}\right)$

where y_B has 0 rows, A_R has 0 columns

while $m(y_B) < m(y)$ **do**

$$\left(\begin{array}{c} y_T \\ \hline y_B \end{array}\right) \rightarrow \left(\begin{array}{c} y_0 \\ \psi_1 \\ \hline y_2 \end{array}\right), \left(\begin{array}{c|c} A_L & A_R \end{array}\right) \rightarrow \left(\begin{array}{cc|c} A_0 & a_1 & A_2 \end{array}\right)$$

where ψ_1 has 1 row, a_1 has 1 column

$a_1 := \psi_1 x + a_1$

$$\left(\begin{array}{c} y_T \\ \hline y_B \end{array}\right) \leftarrow \left(\begin{array}{c} y_0 \\ \hline \psi_1 \\ y_2 \end{array}\right), A \rightarrow \left(\begin{array}{c|c} A_L & A_R \end{array}\right) \leftarrow \left(\begin{array}{c|cc} A_0 & a_1 & A_2 \end{array}\right)$$

endwhile