Step	Algorithm: $A := xy^T \widehat{A}$
1a	$\{A = \widehat{A}$ $\}$
4	$x \rightarrow \left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right)$, $A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right)$ where x_B has 0 rows, A_B has 0 rows
2	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \right\}$
3	while $m(x_B) < m(x)$ do
2,3	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \wedge m(x_B) < m(x) \right\}$
5a	$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \rightarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right)$, $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$ where χ_1 has 1 row, a_1 has 1 row
6	$\left\{ \begin{pmatrix} A_0 \\ a_1^T \\ A_2 \end{pmatrix} = \begin{pmatrix} \widehat{A}_0 \\ \widehat{a}_1^T \\ x_2 y^T + \widehat{A}_2 \end{pmatrix} \right\}$
8	$a_1^T := \chi_1 y^T + a_1^T$
7	$\left\{ \begin{pmatrix} A_0 \\ a_1^T \\ A_2 \end{pmatrix} = \begin{pmatrix} \widehat{A}_0 \\ \chi_1 y^T + \widehat{a}_1^T \\ x_2 y^T + \widehat{A}_2 \end{pmatrix} \right\}$
5b	$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \leftarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right)$, $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$
2	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \right\}$
	endwhile
2,3	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \wedge \neg(m(x_B) < m(x)) \right\}$
1b	$\{A = xy^T + \widehat{A}$ $\}$

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

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

Step	Algorithm: $A := xy^T \widehat{A}$
1a	$\{A = \widehat{A}$ $\}$
4	where
2	$\left\{ \left(\dfrac{A_T}{A_B} \right) = \left(\dfrac{\widehat{A}_T}{x_B y^T + \widehat{A}_B} \right) \right.$
3	while do
2,3	$\left\{ \left(\dfrac{A_T}{A_B} \right) = \left(\dfrac{\widehat{A}_T}{x_B y^T + \widehat{A}_B} \right) \wedge \right.$
5a	where
6	$\left\{ \right.$
8	
7	$\left\{ \right.$
5b	
2	$\left\{ \left(\dfrac{A_T}{A_B} \right) = \left(\dfrac{\widehat{A}_T}{x_B y^T + \widehat{A}_B} \right) \right.$
	endwhile
2,3	$\left\{ \left(\dfrac{A_T}{A_B} \right) = \left(\dfrac{\widehat{A}_T}{x_B y^T + \widehat{A}_B} \right) \wedge \neg(\quad) \right.$
1b	$\{A = xy^T + \widehat{A}$ $\}$

Step	Algorithm: $A := xy^T \widehat{A}$
1a	$\{A = \widehat{A}$ $\}$
4	where
2	$\left\{ \left(\dfrac{A_T}{A_B} \right) = \left(\dfrac{\widehat{A}_T}{x_B y^T + \widehat{A}_B} \right) \right\}$
3	while $m(x_B) < m(x)$ do
2,3	$\left\{ \left(\dfrac{A_T}{A_B} \right) = \left(\dfrac{\widehat{A}_T}{x_B y^T + \widehat{A}_B} \right) \wedge m(x_B) < m(x) \right\}$
5a	where
6	$\left\{ \right.$ $\left. \right\}$
8	
7	$\left\{ \right.$ $\left. \right\}$
5b	
2	$\left\{ \left(\dfrac{A_T}{A_B} \right) = \left(\dfrac{\widehat{A}_T}{x_B y^T + \widehat{A}_B} \right) \right\}$
	endwhile
2,3	$\left\{ \left(\dfrac{A_T}{A_B} \right) = \left(\dfrac{\widehat{A}_T}{x_B y^T + \widehat{A}_B} \right) \wedge \neg(m(x_B) < m(x)) \right\}$
1b	$\{A = xy^T + \widehat{A}$ $\}$

Step	Algorithm: $A := xy^T \widehat{A}$
1a	$\{A = \widehat{A}$ $\}$
4	$x \rightarrow \left(\frac{x_T}{x_B}\right)$, $A \rightarrow \left(\frac{A_T}{A_B}\right)$ where x_B has 0 rows, A_B has 0 rows
2	$\left\{ \left(\frac{A_T}{A_B}\right) = \left(\frac{\widehat{A}_T}{x_B y^T + \widehat{A}_B}\right) \right\}$
3	while $m(x_B) < m(x)$ do
2,3	$\left\{ \left(\frac{A_T}{A_B}\right) = \left(\frac{\widehat{A}_T}{x_B y^T + \widehat{A}_B}\right) \wedge m(x_B) < m(x) \right\}$
5a	where
6	$\left\{ \right\}$
8	
7	$\left\{ \right\}$
5b	
2	$\left\{ \left(\frac{A_T}{A_B}\right) = \left(\frac{\widehat{A}_T}{x_B y^T + \widehat{A}_B}\right) \right\}$
	endwhile
2,3	$\left\{ \left(\frac{A_T}{A_B}\right) = \left(\frac{\widehat{A}_T}{x_B y^T + \widehat{A}_B}\right) \wedge \neg(m(x_B) < m(x)) \right\}$
1b	$\{A = xy^T + \widehat{A}$ $\}$

Step	Algorithm: $A := xy^T \widehat{A}$
1a	$\{A = \widehat{A}$ $\}$
4	$x \rightarrow \left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right)$, $A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right)$ where x_B has 0 rows, A_B has 0 rows
2	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \right\}$
3	while $m(x_B) < m(x)$ do
2,3	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \wedge m(x_B) < m(x) \right\}$
5a	$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \rightarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right)$, $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$ where χ_1 has 1 row, a_1 has 1 row
6	$\left\{ \right\}$
8	
7	$\left\{ \right\}$
5b	$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \leftarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right)$, $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$
2	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \right\}$
	endwhile
2,3	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \wedge \neg(m(x_B) < m(x)) \right\}$
1b	$\{A = xy^T + \widehat{A}$ $\}$

Step	Algorithm: $A := xy^T \widehat{A}$
1a	$\{A = \widehat{A}$ $\}$
4	$x \rightarrow \left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right)$, $A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right)$ where x_B has 0 rows, A_B has 0 rows
2	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \right\}$
3	while $m(x_B) < m(x)$ do
2,3	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \wedge m(x_B) < m(x) \right\}$
5a	$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \rightarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right)$, $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$ where χ_1 has 1 row, a_1 has 1 row
6	$\left\{ \begin{pmatrix} A_0 \\ a_1^T \\ A_2 \end{pmatrix} = \begin{pmatrix} \widehat{A}_0 \\ \widehat{a}_1^T \\ x_2 y^T + \widehat{A}_2 \end{pmatrix} \right\}$
8	
7	$\left\{ \right\}$
5b	$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \leftarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right)$, $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$
2	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \right\}$
	endwhile
2,3	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \wedge \neg(m(x_B) < m(x)) \right\}$
1b	$\{A = xy^T + \widehat{A}$ $\}$

Step	Algorithm: $A := xy^T \widehat{A}$
1a	$\{A = \widehat{A}$ $\}$
4	$x \rightarrow \left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right)$, $A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right)$ where x_B has 0 rows, A_B has 0 rows
2	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \right\}$
3	while $m(x_B) < m(x)$ do
2,3	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \wedge m(x_B) < m(x) \right\}$
5a	$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \rightarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right)$, $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$ where χ_1 has 1 row, a_1 has 1 row
6	$\left\{ \begin{pmatrix} A_0 \\ a_1^T \\ A_2 \end{pmatrix} = \begin{pmatrix} \widehat{A}_0 \\ \widehat{a}_1^T \\ x_2 y^T + \widehat{A}_2 \end{pmatrix} \right\}$
8	
7	$\left\{ \begin{pmatrix} A_0 \\ a_1^T \\ A_2 \end{pmatrix} = \begin{pmatrix} \widehat{A}_0 \\ \chi_1 y^T + \widehat{a}_1^T \\ x_2 y^T + \widehat{A}_2 \end{pmatrix} \right\}$
5b	$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \leftarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right)$, $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$
2	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \right\}$
	endwhile
2,3	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \wedge \neg(m(x_B) < m(x)) \right\}$
1b	$\{A = xy^T + \widehat{A}$ $\}$

Step	Algorithm: $A := xy^T \widehat{A}$
1a	$\{A = \widehat{A}$ $\}$
4	$x \rightarrow \left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right)$, $A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right)$ where x_B has 0 rows, A_B has 0 rows
2	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \right\}$
3	while $m(x_B) < m(x)$ do
2,3	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \wedge m(x_B) < m(x) \right\}$
5a	$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \rightarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right)$, $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$ where χ_1 has 1 row, a_1 has 1 row
6	$\left\{ \begin{pmatrix} A_0 \\ a_1^T \\ A_2 \end{pmatrix} = \begin{pmatrix} \widehat{A}_0 \\ \widehat{a}_1^T \\ x_2 y^T + \widehat{A}_2 \end{pmatrix} \right\}$
8	$a_1^T := \chi_1 y^T + a_1^T$
7	$\left\{ \begin{pmatrix} A_0 \\ a_1^T \\ A_2 \end{pmatrix} = \begin{pmatrix} \widehat{A}_0 \\ \chi_1 y^T + \widehat{a}_1^T \\ x_2 y^T + \widehat{A}_2 \end{pmatrix} \right\}$
5b	$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \leftarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right)$, $\left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$
2	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \right\}$
	endwhile
2,3	$\left\{ \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) = \left(\begin{array}{c} \widehat{A}_T \\ \hline x_B y^T + \widehat{A}_B \end{array}\right) \wedge \neg(m(x_B) < m(x)) \right\}$
1b	$\{A = xy^T + \widehat{A}$ $\}$

Algorithm: $A := xy^T \widehat{A}$

$$x \rightarrow \left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right), \quad A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right)$$

where x_B has 0 rows, A_B has 0 rows

while $m(x_B) < m(x)$ do

$$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \rightarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right), \quad \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$$

where χ_1 has 1 row, a_1 has 1 row

$$a_1^T := \chi_1 y^T + a_1^T$$

$$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \leftarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right), \quad \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$$

endwhile

Algorithm: $A := xy^T \widehat{A}$

$$x \rightarrow \left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right), \; A \rightarrow \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right)$$

where x_B has 0 rows, A_B has 0 rows

while $m(x_B) < m(x)$ do

$$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \rightarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right), \; \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$$

where χ_1 has 1 row, a_1 has 1 row

$$a_1^T := \chi_1 y^T + a_1^T$$

$$\left(\begin{array}{c} x_T \\ \hline x_B \end{array}\right) \leftarrow \left(\begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array}\right), \; \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ \hline a_1^T \\ \hline A_2 \end{array}\right)$$

endwhile