St	ep	Algorithm: $C := AB + C$
1	a	$\{C = \widehat{C}$
4	4	$B \to \begin{pmatrix} B_L \mid B_R \end{pmatrix}$, $C \to \begin{pmatrix} C_L \mid C_R \end{pmatrix}$ where B_R has 0 columns, C_R has 0 columns
6	2	$\left\{ \left(\begin{array}{c c} C_L & C_R \end{array} \right) = \left(\begin{array}{c c} \widehat{C}_L & AB_R + \widehat{C}_R \end{array} \right) $
,	3	while $n(B_R) < n(B)$ do
2	,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land n(B_R) < n(B) \right\}$
5	a	$\begin{pmatrix} B_L \mid B_R \end{pmatrix} \to \begin{pmatrix} B_0 \mid b_1 \mid B_2 \end{pmatrix}, \begin{pmatrix} C_L \mid C_R \end{pmatrix} \to \begin{pmatrix} C_0 \mid c_1 \mid C_2 \end{pmatrix}$ where b_1 has 1 column, c_1 has 1 column
(6	$\left\{ \left(\begin{array}{cc} C_0 & c_1 & C_2 \end{array} \right) = \left(\begin{array}{cc} \widehat{C}_0 & \widehat{c}_1 & AB_2 + \widehat{C}_2 \end{array} \right) $
8	8	$c_1 := Ab_1 + c_1$
	7	$\left\{ \left(\begin{array}{cc} C_0 & c_1 & C_2 \end{array} \right) = \left(\begin{array}{cc} \widehat{C}_0 & Ab_1 + \widehat{c}_1 & AB_2 + \widehat{C}_2 \end{array} \right) $
5	b	$B \to \left(\begin{array}{c c} B_L & B_R \end{array} \right) \leftarrow \left(\begin{array}{c c} B_0 & b_1 & B_2 \end{array} \right), C \to \left(\begin{array}{c c} C_L & C_R \end{array} \right) \leftarrow \left(\begin{array}{c c} C_0 & c_1 & C_2 \end{array} \right)$
	2	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \right\}$
		endwhile
2	,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land \neg (n(B_R) < n(B)) \right\}$
1	b	$\left\{ C = AB + \widehat{C} \right\}$

Step	Algorithm: $C := AB + C$
1a	{
4	where
2	
3	while do
2,3	
5a	where
6	
8	
7	
5b	
2	
	endwhile
2,3	$\left \left\{ \begin{array}{cc} & & & \\ & & \\ & & \end{array} \right. $
1b	{

Step	Algorithm: $C := AB + C$
1a	$\{C = \widehat{C}\}$
4	where
2	
3	while do
2,3	
5a	where
6	
8	
7	
5b	
2	
	endwhile
2,3	$\left \left\{ \begin{array}{cc} & & & \\ & & \\ & & \end{array} \right. \right. $
1b	$\left\{ C = AB + \widehat{C} \right\}$

```
Algorithm: C := AB + C
Step
                \{C=\widehat{C}
  1a
   4
                     where

\left\{ \left( \begin{array}{c|c} C_L & C_R \end{array} \right) = \left( \begin{array}{c|c} \widehat{C}_L & AB_R + \widehat{C}_R \end{array} \right)

   2
                while
                                                      = \left( \left. \widehat{C}_L \right| AB_R + \widehat{C}_R \right) \wedge
                            \left(\begin{array}{c|c} C_L & C_R \end{array}\right)
 2,3
  5a
                              where
   6
   8
   7
  5b
                                 C_L \mid C_R ) = ( \hat{C}_L \mid AB_R + \hat{C}_R )
   2
                endwhile

\overline{\left\{ \left( C_L \middle| C_R \right) = \left( \widehat{C}_L \middle| AB_R + \widehat{C}_R \right) \land \neg ( \right. \right.}

 2,3
                \overline{\left\{C = AB + \widehat{C}\right)}
  1b
```

Step	Algorithm: $C := AB + C$
1a	$\{C = \widehat{C}$
4	
	where
2	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \right\}$
3	while $n(B_R) < n(B)$ do
2,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \wedge n(B_R) < n(B) \right\}$
5a	
	where
6	
8	
7	
5b	
2	$\left\{ \left(C_L \middle C_R \right) = \left(\left. \widehat{C}_L \middle AB_R + \widehat{C}_R \right) \right. \right.$
	endwhile
2,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land \neg (n(B_R) < n(B)) \right\}$
1b	$\left\{C = AB + \widehat{C}\right)$

Step	Algorithm: $C := AB + C$
1a	${C = \widehat{C}}$
4	$B \to \begin{pmatrix} B_L \mid B_R \end{pmatrix}$, $C \to \begin{pmatrix} C_L \mid C_R \end{pmatrix}$ where B_R has 0 columns, C_R has 0 columns
2	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \right\}$
3	while $n(B_R) < n(B)$ do
2,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land n(B_R) < n(B) \right\}$
5a	where
6	$\left\{ \right.$
8	
7	
5b	
2	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \right. $
	endwhile
2,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land \neg (n(B_R) < n(B)) \right\}$
1b	$\left\{ C = AB + \widehat{C} \right\}$

```
Algorithm: C := AB + C
Step
  1a
                \{C=\widehat{C}
                B \to (B_L \mid B_R), C \to (C_L \mid C_R)
   4
                 where B_R has 0 columns, C_R has 0 columns
\left\{ \left( \begin{array}{c|c} C_L & AB_R + \widehat{C}_R \end{array} \right) \right.
   2
                while n(B_R) < n(B) do
                            (C_L \mid C_R) = (\widehat{C}_L \mid AB_R + \widehat{C}_R) \wedge n(B_R) < n(B)
 2,3
                           \left(\begin{array}{c|c} B_L & B_R \end{array}\right) \rightarrow \left(\begin{array}{c|c} B_0 & b_1 & B_2 \end{array}\right), \left(\begin{array}{c|c} C_L & C_R \end{array}\right) \rightarrow \left(\begin{array}{c|c} C_0 & c_1 & C_2 \end{array}\right)
  5a
                               where b_1 has 1 column, c_1 has 1 column
   6
   8
   7

\frac{B \to \begin{pmatrix} B_L \mid B_R \end{pmatrix} \leftarrow \begin{pmatrix} B_0 \mid b_1 \mid B_2 \end{pmatrix}, C \to \begin{pmatrix} C_L \mid C_R \end{pmatrix} \leftarrow \begin{pmatrix} C_0 \mid c_1 \mid C_2 \end{pmatrix}}{\begin{pmatrix} C_L \mid C_R \end{pmatrix} = \begin{pmatrix} \widehat{C}_L \mid AB_R + \widehat{C}_R \end{pmatrix}}

  5b
   2
                endwhile

\overline{\left\{ \left( C_L \middle| C_R \right) = \left( \widehat{C}_L \middle| AB_R + \widehat{C}_R \right) \land \neg (n(B_R) < n(B)) \right\}}

 2,3
                 \{C = AB + \widehat{C}\}
  1b
```

Step	Algorithm: $C := AB + C$
1a	${C = \widehat{C}}$
4	$B \to \begin{pmatrix} B_L \mid B_R \end{pmatrix}$, $C \to \begin{pmatrix} C_L \mid C_R \end{pmatrix}$ where B_R has 0 columns, C_R has 0 columns
2	$\left\{ \left(\begin{array}{c c} C_L & C_R \end{array} \right) = \left(\begin{array}{c c} \widehat{C}_L & AB_R + \widehat{C}_R \end{array} \right) $
3	while $n(B_R) < n(B)$ do
2,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land n(B_R) < n(B) \right\}$
5a	$\begin{pmatrix} B_L \mid B_R \end{pmatrix} \to \begin{pmatrix} B_0 \mid b_1 \mid B_2 \end{pmatrix}, \begin{pmatrix} C_L \mid C_R \end{pmatrix} \to \begin{pmatrix} C_0 \mid c_1 \mid C_2 \end{pmatrix}$ where b_1 has 1 column, c_1 has 1 column
6	$\left\{ \left(\begin{array}{cc} C_0 & c_1 & C_2 \end{array} \right) = \left(\begin{array}{cc} \widehat{C}_0 & \widehat{c}_1 & AB_2 + \widehat{C}_2 \end{array} \right) \right.$
8	
7	
5b	$B \to \begin{pmatrix} B_L \middle B_R \end{pmatrix} \leftarrow \begin{pmatrix} B_0 \middle b_1 \middle B_2 \end{pmatrix}, C \to \begin{pmatrix} C_L \middle C_R \end{pmatrix} \leftarrow \begin{pmatrix} C_0 \middle c_1 \middle C_2 \end{pmatrix}$ $\left\{ \begin{pmatrix} C_L \middle C_R \end{pmatrix} = \begin{pmatrix} \widehat{C}_L \middle AB_R + \widehat{C}_R \end{pmatrix} \right\}$
2	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \right\}$
	endwhile
2,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land \neg (n(B_R) < n(B)) \right\}$
1b	$\left\{ C = AB + \widehat{C} \right\}$

Step	Algorithm: $C := AB + C$
1a	${C = \widehat{C}}$
4	$B \to \begin{pmatrix} B_L & B_R \end{pmatrix}$, $C \to \begin{pmatrix} C_L & C_R \end{pmatrix}$ where B_R has 0 columns, C_R has 0 columns
2	$\left\{ \left(\begin{array}{c c} C_L & C_R \end{array} \right) = \left(\begin{array}{c c} \widehat{C}_L & AB_R + \widehat{C}_R \end{array} \right) $
3	while $n(B_R) < n(B)$ do
2,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land n(B_R) < n(B) \right\}$
5a	$\begin{pmatrix} B_L \mid B_R \end{pmatrix} \to \begin{pmatrix} B_0 \mid b_1 \mid B_2 \end{pmatrix}, \begin{pmatrix} C_L \mid C_R \end{pmatrix} \to \begin{pmatrix} C_0 \mid c_1 \mid C_2 \end{pmatrix}$ where b_1 has 1 column, c_1 has 1 column
6	$\left\{ \left(\begin{array}{cc} C_0 & c_1 & C_2 \end{array} \right) = \left(\begin{array}{cc} \widehat{C}_0 & \widehat{c}_1 & AB_2 + \widehat{C}_2 \end{array} \right) \right.$
8	
7	$\left\{ \left(\begin{array}{cc} C_0 & c_1 & C_2 \end{array} \right) = \left(\begin{array}{cc} \widehat{C}_0 & Ab_1 + \widehat{c}_1 & AB_2 + \widehat{C}_2 \end{array} \right) $
5b	$B \to \left(B_L \middle B_R \right) \leftarrow \left(B_0 \middle b_1 \middle B_2 \right), C \to \left(C_L \middle C_R \right) \leftarrow \left(C_0 \middle c_1 \middle C_2 \right)$
2	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \right\}$
	endwhile
2,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land \neg (n(B_R) < n(B)) \right\}$
1b	$\left\{ C = AB + \widehat{C} \right\}$

Step	Algorithm: $C := AB + C$
1a	${C = \widehat{C}}$
4	$B \to \begin{pmatrix} B_L & B_R \end{pmatrix}$, $C \to \begin{pmatrix} C_L & C_R \end{pmatrix}$ where B_R has 0 columns, C_R has 0 columns
2	$\left\{ \left(\begin{array}{c c} C_L & C_R \end{array} \right) = \left(\begin{array}{c c} \widehat{C}_L & AB_R + \widehat{C}_R \end{array} \right) $
3	while $n(B_R) < n(B)$ do
2,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land n(B_R) < n(B) \right\}$
5a	$\begin{pmatrix} B_L \mid B_R \end{pmatrix} \to \begin{pmatrix} B_0 \mid b_1 \mid B_2 \end{pmatrix}, \begin{pmatrix} C_L \mid C_R \end{pmatrix} \to \begin{pmatrix} C_0 \mid c_1 \mid C_2 \end{pmatrix}$ where b_1 has 1 column, c_1 has 1 column
6	$\left\{ \left(\begin{array}{cc} C_0 & c_1 & C_2 \end{array} \right) = \left(\begin{array}{cc} \widehat{C}_0 & \widehat{c}_1 & AB_2 + \widehat{C}_2 \end{array} \right) \right.$
8	$c_1 := Ab_1 + c_1$
7	$\left\{ \left(\begin{array}{cc} C_0 & c_1 & C_2 \end{array} \right) = \left(\begin{array}{cc} \widehat{C}_0 & Ab_1 + \widehat{c}_1 & AB_2 + \widehat{C}_2 \end{array} \right) $
5b	$B \to \left(B_L \middle B_R \right) \leftarrow \left(B_0 \middle b_1 \middle B_2 \right), C \to \left(C_L \middle C_R \right) \leftarrow \left(C_0 \middle c_1 \middle C_2 \right)$
2	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \right\}$
	endwhile
2,3	$\left\{ \left(C_L \middle C_R \right) = \left(\widehat{C}_L \middle AB_R + \widehat{C}_R \right) \land \neg (n(B_R) < n(B)) \right\}$
1b	$\left\{ C = AB + \widehat{C} \right\}$

Algorithm: $C := AB + C$
$B \to \begin{pmatrix} B_L \mid B_R \end{pmatrix}$, $C \to \begin{pmatrix} C_L \mid C_R \end{pmatrix}$ where B_R has 0 columns, C_R has 0 columns
while $n(B_R) < n(B)$ do
$\begin{pmatrix} B_L \mid B_R \end{pmatrix} \to \begin{pmatrix} B_0 \mid b_1 \mid B_2 \end{pmatrix}, \begin{pmatrix} C_L \mid C_R \end{pmatrix} \to \begin{pmatrix} C_0 \mid c_1 \mid C_2 \end{pmatrix}$ where b_1 has 1 column, c_1 has 1 column
$c_1 := Ab_1 + c_1$
$B \to \left(B_L \middle B_R \right) \leftarrow \left(B_0 \middle b_1 \middle B_2 \right), C \to \left(C_L \middle C_R \right) \leftarrow \left(C_0 \middle c_1 \middle C_2 \right)$
endwhile

Algorithm:
$$C := AB + C$$

$$B \to \begin{pmatrix} B_L \mid B_R \end{pmatrix}, C \to \begin{pmatrix} C_L \mid C_R \end{pmatrix}$$
where B_R has 0 columns, C_R has 0 columns
while $n(B_R) < n(B)$ do
$$\begin{pmatrix} B_L \mid B_R \end{pmatrix} \to \begin{pmatrix} B_0 \mid b_1 \mid B_2 \end{pmatrix}, \begin{pmatrix} C_L \mid C_R \end{pmatrix} \to \begin{pmatrix} C_0 \mid c_1 \mid C_2 \end{pmatrix}$$
where b_1 has 1 column, c_1 has 1 column
$$c_1 := Ab_1 + c_1$$

$$B \to \begin{pmatrix} B_L \mid B_R \end{pmatrix} \leftarrow \begin{pmatrix} B_0 \mid b_1 \mid B_2 \end{pmatrix}, C \to \begin{pmatrix} C_L \mid C_R \end{pmatrix} \leftarrow \begin{pmatrix} C_0 \mid c_1 \mid C_2 \end{pmatrix}$$
endwhile