

## ПРИЛОЖЕНИЕ А

## Итерация №1

## Отношения между операторами:

[illegible]

[illegible]

[illegible]
$$\begin{aligned}
& 1) S_1 \rightarrow S_4 \\
& 2) S_3 \\
& E(S_1) = \{S_3, S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\} \\
& E(S_4) = \{S_6, S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\} \\
& N_1(S_1, S_4) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\} \\
& N_2(S_1, S_4) = \{S_3, S_{10}, S_6, S_{11}\} \\
& E(S_3) = \{S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\} \\
& S_3 \in N_2(S_1, S_4) - \text{выполняется} \\
& N_1(S_1, S_4) \subseteq E(S_3) - \text{выполняется} \\
& \text{выполняется}
\end{aligned}$$

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$$E(S_3) = \{S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$S_3 \in N_2(S_1, S_5) - \text{выполняется}$$

$$N_1(S_1, S_5) \subseteq E(S_3) - \text{выполняется}$$

выполняется

$$1) S_1 \nrightarrow S_6$$

$$2) S_3$$

$$E(S_1) = \{S_3, S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_6) = \{S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_1(S_1, S_6) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_2(S_1, S_6) = \{S_3, S_{10}, S_{11}\}$$

$$E(S_3) = \{S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$S_3 \in N_2(S_1, S_6) - \text{выполняется}$$

$$N_1(S_1, S_6) \subseteq E(S_3) - \text{выполняется}$$

выполняется

$$1) S_1 \nrightarrow S_7$$

$$2) S_3$$

$$E(S_1) = \{S_3, S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_7) = \{S_9, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_1(S_1, S_7) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_2(S_1, S_7) = \{S_3, S_{10}, S_9, S_{12}\}$$

$$E(S_3) = \{S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$S_3 \in N_2(S_1, S_7) - \text{выполняется}$$

$$N_1(S_1, S_7) \subseteq E(S_3) - \text{выполняется}$$

выполняется

$$1) S_1 \nrightarrow S_8$$

$$2) S_3$$

$$E(S_1) = \{S_3, S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_8) = \{S_9, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_1(S_1, S_8) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_2(S_1, S_8) = \{S_3, S_{10}, S_9, S_{12}\}$$

$$E(S_3) = \{S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$S_3 \in N_2(S_1, S_8) - \text{выполняется}$$

$$N_1(S_1, S_8) \subseteq E(S_3) - \text{выполняется}$$

выполняется

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_1 = \{S_1, S_2\}$

## Итерация №2

Отношения между операторами:

[illegible]

[illegible]



$$E(S_3) = \{S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$S_3 \in N_2(\bar{y}_1, S_5) - \text{выполняется}$$

$$N_1(\bar{y}_1, S_5) \subseteq E(S_3) - \text{выполняется}$$

выполняется

$$1) \bar{y}_1 \rightarrow S_6$$

$$2) S_3$$

$$E(\bar{y}_1) = \{S_3, S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_6) = \{S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_1(\bar{y}_1, S_6) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_2(\bar{y}_1, S_6) = \{S_3, S_{10}, S_{11}\}$$

$$E(S_3) = \{S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$S_3 \in N_2(\bar{y}_1, S_6) - \text{выполняется}$$

$$N_1(\bar{y}_1, S_6) \subseteq E(S_3) - \text{выполняется}$$

выполняется

$$1) \bar{y}_1 \rightarrow S_7$$

$$2) S_3$$

$$E(\bar{y}_1) = \{S_3, S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_7) = \{S_9, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_1(\bar{y}_1, S_7) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_2(\bar{y}_1, S_7) = \{S_3, S_{10}, S_9, S_{12}\}$$

$$E(S_3) = \{S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$S_3 \in N_2(\bar{y}_1, S_7) - \text{выполняется}$$

$$N_1(\bar{y}_1, S_7) \subseteq E(S_3) - \text{выполняется}$$

выполняется

$$1) \bar{y}_1 \rightarrow S_8$$

$$2) S_3$$

$$E(\bar{y}_1) = \{S_3, S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_8) = \{S_9, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_1(\bar{y}_1, S_8) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$N_2(\bar{y}_1, S_8) = \{S_3, S_{10}, S_9, S_{12}\}$$

$$E(S_3) = \{S_{10}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$S_3 \in N_2(\bar{y}_1, S_8) - \text{выполняется}$$

$$N_1(\bar{y}_1, S_8) \subseteq E(S_3) - \text{выполняется}$$

выполняется

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_2 = \{S_3, S_4, S_5\}$

### Итерация №3

Отношения между операторами:

[illegible]

[illegible]

[illegible]

Проверка условия приводимости программы к ППФ (5 из 500):

$$\begin{aligned}
& 1) \bar{y}_1 \rightarrow S_8 \\
& 2) \bar{y}_2 \\
& E(\bar{y}_1) = \{\bar{y}_2, S_6, S_{10}, S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\} \\
& E(S_8) = \{S_9, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\} \\
& N_1(\bar{y}_1, S_8) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\} \\
& N_2(\bar{y}_1, S_8) = \{\bar{y}_2, S_6, S_{10}, S_{11}, S_9, S_{12}\} \\
& E(\bar{y}_2) = \{S_6, S_{10}, S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}
\end{aligned}$$



$\bar{y}_2 \in N_2(\bar{y}_1, S_8) - \text{выполняется}$   
 $N_1(\bar{y}_1, S_8) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

1)  $\bar{y}_1 \rightarrow S_9$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, S_6, S_{10}, S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_9) = \{S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $N_1(\bar{y}_1, S_9) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $N_2(\bar{y}_1, S_9) = \{\bar{y}_2, S_6, S_{10}, S_{11}, S_{12}\}$   
 $E(\bar{y}_2) = \{S_6, S_{10}, S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_9) - \text{выполняется}$   
 $N_1(\bar{y}_1, S_9) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

1)  $\bar{y}_1 \rightarrow S_{12}$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, S_6, S_{10}, S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{12}) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $N_1(\bar{y}_1, S_{12}) = \{S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $N_2(\bar{y}_1, S_{12}) = \{\bar{y}_2, S_6, S_{10}, S_{11}\}$   
 $E(\bar{y}_2) = \{S_6, S_{10}, S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{12}) - \text{выполняется}$   
 $N_1(\bar{y}_1, S_{12}) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

1)  $\bar{y}_1 \rightarrow S_{14}$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, S_6, S_{10}, S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{14}) = \{S_{16}, S_{33}\}$   
 $N_1(\bar{y}_1, S_{14}) = \{S_{33}\}$   
 $N_2(\bar{y}_1, S_{14}) = \{\bar{y}_2, S_6, S_{10}, S_{11}, S_{13}, S_{32}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}, S_{16}\}$   
 $E(\bar{y}_2) = \{S_6, S_{10}, S_{11}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{14}) - \text{выполняется}$   
 $N_1(\bar{y}_1, S_{14}) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_3 = \{S_6, S_7, S_8\}$

## Итерация №4

Отношения между операторами:

[illegible]

[illegible]

$$C =$$

$$SI =$$

$$1)\bar{y}_1 \not\rightarrow S_{14}$$
$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$
$$N_1(\bar{y}_1, S_{14}) = \{S_{33}\}$$
$$E(\bar{y}_2) = \{\bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$
$$N_1(\bar{y}_1, S_{14}) \subseteq E(\bar{y}_2) - \text{выполняется}$$
$$1)\bar{y}_1 \not\rightarrow S_{15}$$
$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$
$$N_1(\bar{y}_1, S_{15}) = \{S_{33}\}$$
$$E(\bar{y}_2) = \{\bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{15})$  – выполняется  
 $N_1(\bar{y}_1, S_{15}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

1)  $\bar{y}_1 \rightarrow S_{16}$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{16}) = \{S_{33}\}$   
 $N_1(\bar{y}_1, S_{16}) = \{S_{33}\}$   
 $N_2(\bar{y}_1, S_{16}) = \{\bar{y}_2, \bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{16})$  – выполняется  
 $N_1(\bar{y}_1, S_{16}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

1)  $\bar{y}_1 \rightarrow S_{17}$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{17}) = \{S_{19}, S_{36}\}$   
 $N_1(\bar{y}_1, S_{17}) = \{S_{36}\}$   
 $N_2(\bar{y}_1, S_{17}) = \{\bar{y}_2, \bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{37}, S_{38}, S_{39}, S_{40}, S_{19}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{17})$  – выполняется  
 $N_1(\bar{y}_1, S_{17}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

1)  $\bar{y}_1 \rightarrow S_{18}$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{18}) = \{S_{19}, S_{36}\}$   
 $N_1(\bar{y}_1, S_{18}) = \{S_{36}\}$   
 $N_2(\bar{y}_1, S_{18}) = \{\bar{y}_2, \bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{37}, S_{38}, S_{39}, S_{40}, S_{19}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, S_9, S_{10}, S_{11}, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{18})$  – выполняется  
 $N_1(\bar{y}_1, S_{18}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_4 = \{S_9, S_{10}, S_{11}\}$

## Итерация №5

Отношения между операторами:

[illegible]

	$\bar{y}_1$	$\bar{y}_2$	$\bar{y}_3$	$\bar{y}_4$	$S_{12}$	$S_{13}$	$S_{14}$	$S_{15}$	$S_{16}$	$S_{17}$	$S_{18}$	$S_{19}$	$S_{20}$	$S_{21}$	$S_{22}$	$S_{23}$	$S_{24}$	$S_{25}$	$S_{26}$	$S_{27}$	$S_{28}$	$S_{29}$	$S_{30}$	$S_{31}$	$S_{32}$	$S_{33}$	$S_{34}$	$S_{35}$	$S_{36}$	$S_{37}$	$S_{38}$	$S_{39}$	$S_{40}$	
$\bar{y}_1$	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	
$\bar{y}_2$	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	
$\bar{y}_3$	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	
$\bar{y}_4$	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	
$S_{12}$	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	
$S_{13}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	
$S_{14}$	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	
$S_{15}$	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
$S_{16}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
$S_{17}$	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
$S_{18}$	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
$S_{19}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
$S_{20}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
$S_{21}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
$S_{22}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
$S_{23}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
$S_{24}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0												

[illegible]

Проверка условия приводимости программы к ППФ (5 из 410):

$$2) \bar{\bar{y}}_2$$
$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$
$$E(S_{14}) = \{S_{16}, S_{33}\}$$
$$N_1(\bar{\bar{y}}_1, S_{14}) = \{S_{33}\}$$
$$N_2(\bar{y}_1, S_{14}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}, S_{16}\}$$
$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$
$$\bar{y}_2 \in N_2(\bar{y}_1, S_{14}) - \text{выполняется}$$
$$N_1(\bar{y}_1, S_{14}) \subseteq E(\bar{y}_2) - \text{выполняется}$$

выполняется

$$1)\bar{y}_1 \not\rightarrow S_{15}$$
$$2) \bar{\bar{y}}_2$$
$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$
$$E(S_{15}) = \{S_{16}, S_{33}\}$$
$$N_1(\bar{y}_1, S_{15}) = \{S_{33}\}$$
$$N_2(\bar{y}_1, S_{15}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}, S_{16}\}$$
$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{15})$  – выполняется  
 $N_1(\bar{y}_1, S_{15}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

1)  $\bar{y}_1 \rightarrow S_{16}$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{16}) = \{S_{33}\}$   
 $N_1(\bar{y}_1, S_{16}) = \{S_{33}\}$   
 $N_2(\bar{y}_1, S_{16}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{16})$  – выполняется  
 $N_1(\bar{y}_1, S_{16}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

1)  $\bar{y}_1 \rightarrow S_{17}$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{17}) = \{S_{19}, S_{36}\}$   
 $N_1(\bar{y}_1, S_{17}) = \{S_{36}\}$   
 $N_2(\bar{y}_1, S_{17}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{37}, S_{38}, S_{39}, S_{40}, S_{19}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{17})$  – выполняется  
 $N_1(\bar{y}_1, S_{17}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

1)  $\bar{y}_1 \rightarrow S_{18}$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{18}) = \{S_{19}, S_{36}\}$   
 $N_1(\bar{y}_1, S_{18}) = \{S_{36}\}$   
 $N_2(\bar{y}_1, S_{18}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{37}, S_{38}, S_{39}, S_{40}, S_{19}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, S_{13}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{18})$  – выполняется  
 $N_1(\bar{y}_1, S_{18}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_5 = \{S_{13}, S_{14}, S_{15}\}$

## Итерация №6

Отношения между операторами:

[illegible]

	$\bar{y}_1$	$\bar{y}_2$	$\bar{y}_3$	$\bar{y}_4$	$S_{12}$	$\bar{y}_5$	$S_{16}$	$S_{17}$	$S_{18}$	$S_{19}$	$S_{20}$	$S_{21}$	$S_{22}$	$S_{23}$	$S_{24}$	$S_{25}$	$S_{26}$	$S_{27}$	$S_{28}$	$S_{29}$	$S_{30}$	$S_{31}$	$S_{32}$	$S_{33}$	$S_{34}$	$S_{35}$	$S_{36}$	$S_{37}$	$S_{38}$	$S_{39}$	$S_{40}$		
WD=	$\bar{y}_1$	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1		
	$\bar{y}_2$	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1		
	$\bar{y}_3$	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1		
	$\bar{y}_4$	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1		
	$S_{12}$	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1		
	$\bar{y}_5$	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1		
	$S_{16}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0		
	$S_{17}$	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
	$S_{18}$	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	$S_{19}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	$S_{20}$	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	$S_{21}$	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	$S_{22}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	$S_{23}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	$S_{24}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	$S_{25}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	$S_{26}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{27}$	0	0	0	0																												



[illegible]

[illegible]

Проверка условия приводимости программы к ППФ (5 из 347):

$$1)\bar{y}_1 \not\rightarrow S_{17}$$

$$2) \bar{\bar{y}}_2$$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_{17}) = \{S_{19}, S_{36}\}$$

$$N_1(\bar{y}_1, S_{17}) = \{S_{36}\}$$

$$N_2(\bar{y}_1, S_{17}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{37}, S_{38}, S_{39}, S_{40}, S_{19}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$\bar{y}_2 \in N_2(\bar{y}_1, S_{17}) - \text{выполняется}$$

$$N_1(\bar{y}_1, S_{17}) \subseteq E(\bar{y}_2) - \text{выполняется}$$

выполняется

$$1)\bar{\bar{y}}_1 \not\rightarrow S_{18}$$

$$2) \bar{\bar{y}}_2$$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_{18}) = \{S_{19}, S_{36}\}$$

$$N_1(\bar{y}_1, S_{18}) = \{S_{36}\}$$

$$N_2(\bar{y}_1, S_{18}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{37}, S_{38}, S_{39}, S_{40}, S_{19}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{18})$  – выполняется

$$N_1(\bar{y}_1, S_{18}) \subseteq E(\bar{y}_2) \text{ – выполняется}$$

выполняется

$$1) \bar{y}_1 \nrightarrow S_{19}$$

$$2) \bar{y}_2$$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_{19}) = \{S_{36}\}$$

$$N_1(\bar{y}_1, S_{19}) = \{S_{36}\}$$

$$N_2(\bar{y}_1, S_{19}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{19})$  – выполняется

$$N_1(\bar{y}_1, S_{19}) \subseteq E(\bar{y}_2) \text{ – выполняется}$$

выполняется

$$1) \bar{y}_1 \nrightarrow S_{20}$$

$$2) \bar{y}_2$$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_{20}) = \{S_{22}, S_{39}\}$$

$$N_1(\bar{y}_1, S_{20}) = \{S_{39}\}$$

$$N_2(\bar{y}_1, S_{20}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{40}, S_{22}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{20})$  – выполняется

$$N_1(\bar{y}_1, S_{20}) \subseteq E(\bar{y}_2) \text{ – выполняется}$$

выполняется

$$1) \bar{y}_1 \nrightarrow S_{21}$$

$$2) \bar{y}_2$$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_{21}) = \{S_{22}, S_{39}\}$$

$$N_1(\bar{y}_1, S_{21}) = \{S_{39}\}$$

$$N_2(\bar{y}_1, S_{21}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{40}, S_{22}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, S_{16}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{21})$  – выполняется

$$N_1(\bar{y}_1, S_{21}) \subseteq E(\bar{y}_2) \text{ – выполняется}$$

выполняется

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_6 = \{S_{16}, S_{17}, S_{18}\}$

# Итерация №7

Отношения между операторами:

	$\bar{y}_1$	$\bar{y}_2$	$\bar{y}_3$	$\bar{y}_4$	$S_{12}$	$\bar{y}_5$	$\bar{y}_6$	$S_{19}$	$S_{20}$	$S_{21}$	$S_{22}$	$S_{23}$	$S_{24}$	$S_{25}$	$S_{26}$	$S_{27}$	$S_{28}$	$S_{29}$	$S_{30}$	$S_{31}$	$S_{32}$	$S_{33}$	$S_{34}$	$S_{35}$	$S_{36}$	$S_{37}$	$S_{38}$	$S_{39}$	$S_{40}$
SD=	$\bar{y}_1$	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$\bar{y}_2$	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	$\bar{y}_3$	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
	$\bar{y}_4$	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	$S_{12}$	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$\bar{y}_5$	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
	$\bar{y}_6$	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	$S_{19}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	$S_{20}$	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{21}$	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{22}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	$S_{23}$	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{24}$	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{25}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	$S_{26}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{27}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{28}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{29}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	$S_{30}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	$S_{31}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	$S_{32}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{33}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{34}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{35}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{36}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{37}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{38}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{39}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	$S_{40}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[illegible]

[illegible]

	$\bar{y}_1$	$\bar{y}_2$	$\bar{y}_3$	$\bar{y}_4$	$S_{12}$	$\bar{y}_5$	$\bar{y}_6$	$S_{19}$	$S_{20}$	$S_{21}$	$S_{22}$	$S_{23}$	$S_{24}$	$S_{25}$	$S_{26}$	$S_{27}$	$S_{28}$	$S_{29}$	$S_{30}$	$S_{31}$	$S_{32}$	$S_{33}$	$S_{34}$	$S_{35}$	$S_{36}$	$S_{37}$	$S_{38}$	$S_{39}$	$S_{40}$
SI=	$\bar{y}_1$	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$\bar{y}_2$	0	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$\bar{y}_3$	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$\bar{y}_4$	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$S_{12}$	0	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$\bar{y}_5$	0	0	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$\bar{y}_6$	0	0	0	0	0	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1
	$S_{19}$	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
	$S_{20}$	1	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
	$S_{21}$	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
	$S_{22}$	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
	$S_{23}$	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
	$S_{24}$	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
	$S_{25}$	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
	$S_{26}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{27}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{28}$	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{29}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
	$S_{30}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
	$S_{31}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0
	$S_{32}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{33}$	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{34}$	0	0	0	0	0	0	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{35}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{36}$	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{37}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{38}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{39}$	0	0	0	0	0	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{40}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1

Проверка условия приводимости программы к ППФ (5 из 286):

1)  $\bar{y}_1 \rightarrow S_{20}$

2)  $\bar{y}_2$

$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$E(S_{20}) = \{S_{22}, S_{39}\}$

$N_1(\bar{y}_1, S_{20}) = \{S_{39}\}$

$N_2(\bar{y}_1, S_{20}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{40}, S_{22}\}$

$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{20})$  — выполняется

$N_1(\bar{y}_1, S_{20}) \subseteq E(\bar{y}_2)$  — выполняется

выполняется

1)  $\bar{y}_1 \rightarrow S_{21}$

2)  $\bar{y}_2$

$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$E(S_{21}) = \{S_{22}, S_{39}\}$

$N_1(\bar{y}_1, S_{21}) = \{S_{39}\}$

$N_2(\bar{y}_1, S_{21}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{40}, S_{22}\}$

$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{21})$  — выполняется

$N_1(\bar{y}_1, S_{21}) \subseteq E(\bar{y}_2)$  — выполняется

выполняется

1)  $\bar{y}_1 \rightarrow S_{22}$

2)  $\bar{y}_2$

$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$E(S_{22}) = \{S_{39}\}$

$N_1(\bar{y}_1, S_{22}) = \{S_{39}\}$

$N_2(\bar{y}_1, S_{22}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{40}\}$

$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{22})$  – выполняется  
 $N_1(\bar{y}_1, S_{22}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

1)  $\bar{y}_1 \nrightarrow S_{23}$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{23}) = \{S_{25}, S_{34}\}$   
 $N_1(\bar{y}_1, S_{23}) = \{S_{34}\}$   
 $N_2(\bar{y}_1, S_{23}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}, S_{25}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{23})$  – выполняется  
 $N_1(\bar{y}_1, S_{23}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

1)  $\bar{y}_1 \nrightarrow S_{24}$   
 2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{24}) = \{S_{25}, S_{34}\}$   
 $N_1(\bar{y}_1, S_{24}) = \{S_{34}\}$   
 $N_2(\bar{y}_1, S_{24}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}, S_{25}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{24})$  – выполняется  
 $N_1(\bar{y}_1, S_{24}) \subseteq E(\bar{y}_2)$  – выполняется  
 выполняется

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_7 = \{S_{20}, S_{21}\}$

## Итерация №8

Отношения между операторами:

[illegible]





	$\bar{y}_1$	$\bar{y}_2$	$\bar{y}_3$	$\bar{y}_4$	$S_{12}$	$\bar{y}_5$	$\bar{y}_6$	$S_{19}$	$\bar{y}_7$	$S_{22}$	$S_{23}$	$S_{24}$	$S_{25}$	$S_{26}$	$S_{27}$	$S_{28}$	$S_{29}$	$S_{30}$	$S_{31}$	$S_{32}$	$S_{33}$	$S_{34}$	$S_{35}$	$S_{36}$	$S_{37}$	$S_{38}$	$S_{39}$	$S_{40}$
SI =	$\bar{y}_1$	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$\bar{y}_2$	0	1	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$\bar{y}_3$	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$\bar{y}_4$	0	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$S_{12}$	0	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$\bar{y}_5$	0	0	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	$\bar{y}_6$	0	0	0	0	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1
	$S_{19}$	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
	$\bar{y}_7$	1	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
	$S_{22}$	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
	$S_{23}$	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
	$S_{24}$	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
	$S_{25}$	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
	$S_{26}$	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{27}$	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{28}$	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{29}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
	$S_{30}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
	$S_{31}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0
	$S_{32}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{33}$	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{34}$	0	0	0	0	0	0	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{35}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{36}$	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{37}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{38}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{39}$	0	0	0	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	$S_{40}$	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1

Проверка условия приводимости программы к ППФ (5 из 261):

1)  $\bar{y}_1 \rightarrow \bar{y}_7$

2)  $\bar{y}_2$

$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$E(\bar{y}_7) = \{S_{22}, S_{39}\}$

$N_1(\bar{y}_1, \bar{y}_7) = \{S_{39}\}$

$N_2(\bar{y}_1, \bar{y}_7) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{40}, S_{22}\}$

$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_7) - \text{выполняется}$

$N_1(\bar{y}_1, \bar{y}_7) \subseteq E(\bar{y}_2) - \text{выполняется}$

**выполняется**

1)  $\bar{y}_1 \rightarrow S_{22}$

2)  $\bar{y}_2$

$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$E(S_{22}) = \{S_{39}\}$

$N_1(\bar{y}_1, S_{22}) = \{S_{39}\}$

$N_2(\bar{y}_1, S_{22}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{40}\}$

$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{22}) - \text{выполняется}$

$N_1(\bar{y}_1, S_{22}) \subseteq E(\bar{y}_2) - \text{выполняется}$

**выполняется**

1)  $\bar{y}_1 \rightarrow S_{23}$

2)  $\bar{y}_2$

$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$E(S_{23}) = \{S_{25}, S_{34}\}$

$N_1(\bar{y}_1, S_{23}) = \{S_{34}\}$

$N_2(\bar{y}_1, S_{23}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}, S_{25}\}$

$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{23}) - \text{выполняется}$

$N_1(\bar{y}_1, S_{23}) \subseteq E(\bar{y}_2)$  – выполняется

выполняется

1)  $\bar{y}_1 \rightarrow S_{24}$

2)  $\bar{y}_2$

$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$E(S_{24}) = \{S_{25}, S_{34}\}$

$N_1(\bar{y}_1, S_{24}) = \{S_{34}\}$

$N_2(\bar{y}_1, S_{24}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}, S_{25}\}$

$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{24})$  – выполняется

$N_1(\bar{y}_1, S_{24}) \subseteq E(\bar{y}_2)$  – выполняется

выполняется

1)  $\bar{y}_1 \rightarrow S_{25}$

2)  $\bar{y}_2$

$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$E(S_{25}) = \{S_{34}\}$

$N_1(\bar{y}_1, S_{25}) = \{S_{34}\}$

$N_2(\bar{y}_1, S_{25}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$

$\bar{y}_2 \in N_2(\bar{y}_1, S_{25})$  – выполняется

$N_1(\bar{y}_1, S_{25}) \subseteq E(\bar{y}_2)$  – выполняется

выполняется

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_8 = \{S_{22}, S_{23}, S_{24}\}$

## Итерация №9

Отношения между операторами:

[illegible]

[illegible]



$N_1(\bar{y}_1, \bar{y}_7) = \{S_{34}, S_{39}\}$   
 $N_2(\bar{y}_1, \bar{y}_7) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, S_{40}, \bar{y}_8, S_{25}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_7) - \text{выполняется}$   
 $N_1(\bar{y}_1, \bar{y}_7) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

1)  $\bar{y}_1 \nrightarrow \bar{y}_8$   
2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(\bar{y}_8) = \{S_{25}, S_{34}, S_{39}\}$   
 $N_1(\bar{y}_1, \bar{y}_8) = \{S_{34}, S_{39}\}$   
 $N_2(\bar{y}_1, \bar{y}_8) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, S_{40}, S_{25}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_8) - \text{выполняется}$   
 $N_1(\bar{y}_1, \bar{y}_8) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

1)  $\bar{y}_1 \nrightarrow S_{25}$   
2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{25}) = \{S_{34}\}$   
 $N_1(\bar{y}_1, S_{25}) = \{S_{34}\}$   
 $N_2(\bar{y}_1, S_{25}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{25}) - \text{выполняется}$   
 $N_1(\bar{y}_1, S_{25}) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

1)  $\bar{y}_1 \nrightarrow S_{26}$   
2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{26}) = \{S_{28}\}$   
 $N_1(\bar{y}_1, S_{26}) = \emptyset$   
 $N_2(\bar{y}_1, S_{26}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}, S_{28}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{26}) - \text{выполняется}$   
 $N_1(\bar{y}_1, S_{26}) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

1)  $\bar{y}_1 \nrightarrow S_{27}$   
2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{27}) = \{S_{28}\}$   
 $N_1(\bar{y}_1, S_{27}) = \emptyset$   
 $N_2(\bar{y}_1, S_{27}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}, S_{28}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{27}) - \text{выполняется}$   
 $N_1(\bar{y}_1, S_{27}) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_9 = \{S_{25}, S_{26}, S_{27}\}$

## Итерация №10

Отношения между операторами:

[illegible]

$$\text{WD} = \begin{matrix} & \bar{y}_1 & \bar{y}_2 & \bar{y}_3 & \bar{y}_4 & S_{12} & \bar{y}_5 & \bar{y}_6 & S_{19} & \bar{y}_7 & \bar{y}_8 & \bar{y}_9 & S_{28} & S_{29} & S_{30} & S_{31} & S_{32} & S_{33} & S_{34} & S_{35} & S_{36} & S_{37} & S_{38} & S_{39} & S_{40} \\ \left[ \begin{array}{l} \bar{y}_1 \\ \bar{y}_2 \\ \bar{y}_3 \\ \bar{y}_4 \\ S_{12} \\ \bar{y}_5 \\ \bar{y}_6 \\ S_{19} \\ \bar{y}_7 \\ \bar{y}_8 \\ \bar{y}_9 \\ S_{28} \\ S_{29} \\ S_{30} \\ S_{31} \\ S_{32} \\ S_{33} \\ S_{34} \\ S_{35} \\ S_{36} \\ S_{37} \\ S_{38} \\ S_{39} \\ S_{40} \end{array} \right] \end{matrix}$$





$\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_8) - \text{выполняется}$   
 $N_1(\bar{y}_1, \bar{y}_8) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

1)  $\bar{y}_1 \rightarrow \bar{y}_9$   
2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(\bar{y}_9) = \{S_{28}, S_{34}\}$   
 $N_1(\bar{y}_1, \bar{y}_9) = \{S_{34}\}$   
 $N_2(\bar{y}_1, \bar{y}_9) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}, S_{28}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_9) - \text{выполняется}$   
 $N_1(\bar{y}_1, \bar{y}_9) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

1)  $\bar{y}_1 \rightarrow S_{28}$   
2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{28}) = \emptyset$   
 $N_1(\bar{y}_1, S_{28}) = \emptyset$   
 $N_2(\bar{y}_1, S_{28}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{28}) - \text{выполняется}$   
 $N_1(\bar{y}_1, S_{28}) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

1)  $\bar{y}_1 \rightarrow S_{29}$   
2)  $\bar{y}_2$   
 $E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $E(S_{29}) = \{S_{31}, S_{40}\}$   
 $N_1(\bar{y}_1, S_{29}) = \{S_{40}\}$   
 $N_2(\bar{y}_1, S_{29}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{31}\}$   
 $E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$   
 $\bar{y}_2 \in N_2(\bar{y}_1, S_{29}) - \text{выполняется}$   
 $N_1(\bar{y}_1, S_{29}) \subseteq E(\bar{y}_2) - \text{выполняется}$   
**выполняется**

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_{10} = \{S_{28}, S_{29}, S_{30}\}$

## Итерация №11

### Отношения между операторами:

[illegible]

[illegible]

[illegible]

[illegible]

Проверка условия приводимости программы к ППФ (5 из 115):

$$1) \bar{y}_1 \not\rightarrow \bar{y}_7$$

$2)\bar{\bar{y}}_2$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(\bar{y}_7) = \{\bar{y}_8, \bar{y}_9, \bar{y}_{10}, S_{31}, S_{34}, S_{39}, S_{40}\}$$

$$N_1(\bar{y}_1, \bar{y}_7) = \{S_{34}, S_{39}, S_{40}\}$$

$$N_2(\bar{y}_1, \bar{y}_7) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, \bar{y}_8, \bar{y}_9, \bar{y}_{10}, S_{31}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_7) - \text{выполняется}$$

$$N_1(\bar{y}_1, \bar{y}_7) \subseteq E(\bar{y}_2) - \text{выполняется}$$

выполняется

$$1) \bar{y}_1 \not\rightarrow \bar{y}_8$$

$$2) \bar{\bar{y}}_2$$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(\bar{y}_8) = \{\bar{y}_9, \bar{y}_{10}, S_{31}, S_{34}, S_{39}, S_{40}\}$$

$$N_1(\bar{y}_1, \bar{y}_8) = \{S_{34}, S_{39}, S_{40}\}$$

$$N_2(\bar{y}_1, \bar{y}_8) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, \bar{y}_9, \bar{y}_{10}, S_{31}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_8) - \text{выполняется}$$

$$N_1(\bar{y}_1, \bar{y}_8) \subseteq E(\bar{y}_2) - \text{выполняется}$$

выполняется

$$1) \bar{y}_1 \not\rightarrow \bar{y}_9$$

$$2) \bar{y}_2$$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(\bar{y}_9) = \{\bar{y}_{10}, S_{31}, S_{34}, S_{40}\}$$

$$N_1(\bar{y}_1, \bar{y}_9) = \{S_{34}, S_{40}\}$$

$$N_2(\bar{y}_1, \bar{y}_9) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, \bar{y}_{10}, S_{31}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_9) - \text{выполняется}$$

$$N_1(\bar{y}_1, \bar{y}_9) \subseteq E(\bar{y}_2) - \text{выполняется}$$

выполняется

$$1) \bar{y}_1 \not\rightarrow \bar{y}_{10}$$

$$2) \bar{y}_2$$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(\bar{\bar{y}}_{10}) = \{S_{31}, S_{40}\}$$

$$N_1(\bar{\bar{y}}_1, \bar{\bar{y}}_{10}) = \{S_{40}\}$$

$$N_2(\bar{y}_1, \bar{y}_{10}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{31}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_{10}) - \text{выполняется}$$

$$N_1(\bar{y}_1, \bar{y}_{10}) \subseteq E(\bar{y}_2) - \text{выполняется}$$

выполняется

$$1) \bar{y}_1 \nrightarrow S_{31}$$

$$2) \bar{y}_2$$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$E(S_{31}) = \{S_{40}\}$$

$$N_1(\bar{y}_1, S_{31}) = \{S_{40}\}$$

$$N_2(\bar{y}_1, S_{31}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}, S_{40}\}$$

$$\bar{y}_2 \in N_2(\bar{y}_1, S_{31}) - \text{выполняется}$$

$$N_1(\bar{y}_1, S_{31}) \subseteq E(\bar{y}_2) - \text{выполняется}$$

выполняется

На текущей итерации был выделен параллельный групповой оператор  $\bar{y}_{11} = \{S_{31}, S_{32}, S_{33}, S_{34}, S_{35}, S_{36}, S_{37}, S_{38}, S_{39}\}$

## Итерация №12

Отношения между операторами:

[illegible]

[illegible]

[illegible]

$$SI = \begin{matrix} & \bar{y}_1 & \bar{y}_2 & \bar{y}_3 & \bar{y}_4 & S_{12} & \bar{y}_5 & \bar{y}_6 & S_{19} & \bar{y}_7 & \bar{y}_8 & \bar{y}_9 & \bar{y}_{10} & \bar{y}_{11} & S_{40} \\ \begin{matrix} \bar{y}_1 \\ \bar{y}_2 \\ \bar{y}_3 \\ \bar{y}_4 \\ S_{12} \\ \bar{y}_5 \\ \bar{y}_6 \\ S_{19} \\ \bar{y}_7 \\ \bar{y}_8 \\ \bar{y}_9 \\ \bar{y}_{10} \\ \bar{y}_{11} \\ S_{40} \end{matrix} & \left[ \begin{array}{cccccccccccccc} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 1 & 1 & 0 & 0 \\ 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{array} \right] \end{matrix}$$

Проверка условия приводимости программы к ППФ (5 из 30):

1)  $\bar{y}_1 \nrightarrow \bar{y}_7$

2)  $\bar{y}_2$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{11}, S_{40}\}$$

$$E(\bar{y}_7) = \{\bar{y}_8, \bar{y}_9, \bar{y}_{10}, \bar{y}_{11}, S_{40}\}$$

$$N_1(\bar{y}_1, \bar{y}_7) = \{\bar{y}_{11}, S_{40}\}$$

$$N_2(\bar{y}_1, \bar{y}_7) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_8, \bar{y}_9, \bar{y}_{10}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{11}, S_{40}\}$$

$$\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_7) - \text{выполняется}$$

$$N_1(\bar{y}_1, \bar{y}_7) \subseteq E(\bar{y}_2) - \text{выполняется}$$

**выполняется**

1)  $\bar{y}_1 \nrightarrow \bar{y}_8$

2)  $\bar{y}_2$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{11}, S_{40}\}$$

$$E(\bar{y}_8) = \{\bar{y}_9, \bar{y}_{10}, \bar{y}_{11}, S_{40}\}$$

$$N_1(\bar{y}_1, \bar{y}_8) = \{\bar{y}_{11}, S_{40}\}$$

$$N_2(\bar{y}_1, \bar{y}_8) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_9, \bar{y}_{10}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{11}, S_{40}\}$$

$$\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_8) - \text{выполняется}$$

$$N_1(\bar{y}_1, \bar{y}_8) \subseteq E(\bar{y}_2) - \text{выполняется}$$

**выполняется**

1)  $\bar{y}_1 \nrightarrow \bar{y}_9$

2)  $\bar{y}_2$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{11}, S_{40}\}$$

$$E(\bar{y}_9) = \{\bar{y}_{10}, \bar{y}_{11}, S_{40}\}$$

$$N_1(\bar{y}_1, \bar{y}_9) = \{\bar{y}_{11}, S_{40}\}$$

$$N_2(\bar{y}_1, \bar{y}_9) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{10}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{11}, S_{40}\}$$

$$\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_9) - \text{выполняется}$$

$$N_1(\bar{y}_1, \bar{y}_9) \subseteq E(\bar{y}_2) - \text{выполняется}$$

**выполняется**

1)  $\bar{y}_1 \nrightarrow \bar{y}_{10}$

2)  $\bar{y}_2$

$$E(\bar{y}_1) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{11}, S_{40}\}$$

$$E(\bar{y}_{10}) = \{\bar{y}_{11}, S_{40}\}$$

$$N_1(\bar{y}_1, \bar{y}_{10}) = \{\bar{y}_{11}, S_{40}\}$$

$$N_2(\bar{y}_1, \bar{y}_{10}) = \{\bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}\}$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{11}, S_{40}\}$$

$$\bar{y}_2 \in N_2(\bar{y}_1, \bar{y}_{10}) - \text{выполняется}$$

$$N_1(\bar{y}_1, \bar{y}_{10}) \subseteq E(\bar{y}_2) - \text{выполняется}$$

**выполняется**

$$1) \bar{y}_2 \nleftrightarrow \bar{y}_7$$

$$2) \bar{y}_3$$

$$E(\bar{y}_2) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{11}, S_{40}\}$$

$$E(\bar{y}_7) = \{\bar{y}_8, \bar{y}_9, \bar{y}_{10}, \bar{y}_{11}, S_{40}\}$$

$$N_1(\bar{y}_2, \bar{y}_7) = \{\bar{y}_{11}, S_{40}\}$$

$$N_2(\bar{y}_2, \bar{y}_7) = \{\bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_8, \bar{y}_9, \bar{y}_{10}\}$$

$$E(\bar{y}_3) = \{\bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}, \bar{y}_{11}, S_{40}\}$$

$$\bar{y}_3 \in N_2(\bar{y}_2, \bar{y}_7) - \text{выполняется}$$

$$N_1(\bar{y}_2, \bar{y}_7) \subseteq E(\bar{y}_3) - \text{выполняется}$$

выполняется

На текущей итерации был выделен последовательный групповой оператор  $\bar{y}_1 = \{\bar{y}_1, \bar{y}_2, \bar{y}_3, \bar{y}_4, S_{12}, \bar{y}_5, \bar{y}_6, S_{19}\}$

# Итерация №13

Отношения между операторами:

$$SD = \begin{matrix} & \bar{y}_1 & \bar{y}_7 & \bar{y}_8 & \bar{y}_9 & \bar{y}_{10} & \bar{y}_{11} & S_{40} \\ \begin{matrix} \bar{y}_1 \\ \bar{y}_7 \\ \bar{y}_8 \\ \bar{y}_9 \\ \bar{y}_{10} \\ \bar{y}_{11} \\ S_{40} \end{matrix} & \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \end{matrix}$$

$$WD = \begin{matrix} & \bar{y}_1 & \bar{y}_7 & \bar{y}_8 & \bar{y}_9 & \bar{y}_{10} & \bar{y}_{11} & S_{40} \\ \begin{matrix} \bar{y}_1 \\ \bar{y}_7 \\ \bar{y}_8 \\ \bar{y}_9 \\ \bar{y}_{10} \\ \bar{y}_{11} \\ S_{40} \end{matrix} & \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \end{matrix}$$

$$C = \begin{matrix} & \bar{y}_1 & \bar{y}_7 & \bar{y}_8 & \bar{y}_9 & \bar{y}_{10} & \bar{y}_{11} & S_{40} \\ \begin{matrix} \bar{y}_1 \\ \bar{y}_7 \\ \bar{y}_8 \\ \bar{y}_9 \\ \bar{y}_{10} \\ \bar{y}_{11} \\ S_{40} \end{matrix} & \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \end{matrix}$$

$$SI = \begin{matrix} & \bar{y}_1 & \bar{y}_7 & \bar{y}_8 & \bar{y}_9 & \bar{y}_{10} & \bar{y}_{11} & S_{40} \\ \begin{matrix} \bar{y}_1 \\ \bar{y}_7 \\ \bar{y}_8 \\ \bar{y}_9 \\ \bar{y}_{10} \\ \bar{y}_{11} \\ S_{40} \end{matrix} & \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix} \end{matrix}$$

Проверка условия приводимости программы к ППФ (2 из 2):

1)  $\bar{y}_1 \not\rightarrow \bar{y}_9$

2)  $\bar{y}_8$

$E(\bar{y}_1) = \{\bar{y}_{11}, S_{40}\}$

$E(\bar{y}_9) = \{\bar{y}_{10}, \bar{y}_{11}, S_{40}\}$

$N_1(\bar{y}_1, \bar{y}_9) = \{\bar{y}_{11}, S_{40}\}$

$N_2(\bar{y}_1, \bar{y}_9) = \{\bar{y}_{10}\}$

$E(\bar{y}_8) = \{\bar{y}_9, \bar{y}_{10}, \bar{y}_{11}, S_{40}\}$

$\bar{y}_8 \in N_2(\bar{y}_1, \bar{y}_9)$  — не выполняется

$N_1(\bar{y}_1, \bar{y}_9) \subseteq E(\bar{y}_8)$  — выполняется

не выполняется

1)  $\bar{y}_1 \not\rightarrow \bar{y}_{10}$

2)  $\bar{y}_9$

$E(\bar{y}_1) = \{\bar{y}_{11}, S_{40}\}$

$E(\bar{y}_{10}) = \{\bar{y}_{11}, S_{40}\}$

$N_1(\bar{y}_1, \bar{y}_{10}) = \{\bar{y}_{11}, S_{40}\}$

$N_2(\bar{y}_1, \bar{y}_{10}) = \emptyset$

$E(\bar{y}_9) = \{\bar{y}_{10}, \bar{y}_{11}, S_{40}\}$

$\bar{y}_9 \in N_2(\bar{y}_1, \bar{y}_{10})$  — не выполняется

$N_1(\bar{y}_1, \bar{y}_{10}) \subseteq E(\bar{y}_9)$  — выполняется



не выполняется

На текущей итерации был выделен последовательный групповой оператор  $\bar{y}_2 = \{\bar{y}_7, \bar{y}_8, \bar{y}_9, \bar{y}_{10}\}$

# Итерация №14

Отношения между операторами:

$$SD = \begin{matrix} & \bar{y}_1 & \bar{y}_2 & \bar{\bar{y}}_{11} & S_{40} \\ \begin{matrix} \bar{y}_1 \\ \bar{y}_2 \\ \bar{\bar{y}}_{11} \\ S_{40} \end{matrix} & \begin{bmatrix} 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix} \end{matrix}$$

$$WD = \begin{matrix} & \bar{y}_1 & \bar{y}_2 & \bar{\bar{y}}_{11} & S_{40} \\ \begin{matrix} \bar{y}_1 \\ \bar{y}_2 \\ \bar{\bar{y}}_{11} \\ S_{40} \end{matrix} & \begin{bmatrix} 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix} \end{matrix}$$

$$C = \begin{matrix} & \bar{y}_1 & \bar{y}_2 & \bar{\bar{y}}_{11} & S_{40} \\ \begin{matrix} \bar{y}_1 \\ \bar{y}_2 \\ \bar{\bar{y}}_{11} \\ S_{40} \end{matrix} & \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \end{matrix}$$

$$SI = \begin{matrix} & \bar{y}_1 & \bar{y}_2 & \bar{\bar{y}}_{11} & S_{40} \\ \begin{matrix} \bar{y}_1 \\ \bar{y}_2 \\ \bar{\bar{y}}_{11} \\ S_{40} \end{matrix} & \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \end{matrix}$$

Проверка условия приводимости программы к ППФ (0 из 0):

На текущей итерации был выделен последовательный групповой оператор  $\bar{y}_3 = \{\bar{y}_1, \bar{y}_2, \bar{\bar{y}}_{11}, S_{40}\}$

$$\begin{aligned}
 &S_1 \\
 &C(S_1) = \{a_{2233}\} \\
 &R(S_1) = \{a_{22}, a_{33}\} \\
 &I(S_1) = \{a_{22}, a_{33}\} \\
 &O(S_1) = \{a_{2233}\} \\
 &S_2 \\
 &C(S_2) = \{a_{2332}\} \\
 &R(S_2) = \{a_{23}, a_{32}\} \\
 &I(S_2) = \{a_{23}, a_{32}\} \\
 &O(S_2) = \{a_{2332}\} \\
 &S_3 \\
 &C(S_3) = \{A_{11}\} \\
 &R(S_3) = \{a_{2233}, a_{2332}\} \\
 &I(S_3) = \emptyset \\
 &O(S_3) = \{A_{11}\} \\
 &S_4 \\
 &C(S_4) = \{a_{2133}\} \\
 &R(S_4) = \{a_{21}, a_{33}\} \\
 &I(S_4) = \{a_{21}, a_{33}\} \\
 &O(S_4) = \{a_{2133}\} \\
 &S_5 \\
 &C(S_5) = \{a_{2331}\} \\
 &R(S_5) = \{a_{23}, a_{31}\} \\
 &I(S_5) = \{a_{23}, a_{31}\} \\
 &O(S_5) = \{a_{2331}\} \\
 &S_6 \\
 &C(S_6) = \{A_{12}\} \\
 &R(S_6) = \{a_{2133}, a_{2331}\} \\
 &I(S_6) = \emptyset \\
 &O(S_6) = \{A_{12}\} \\
 &S_7 \\
 &C(S_7) = \{a_{2132}\} \\
 &R(S_7) = \{a_{21}, a_{32}\} \\
 &I(S_7) = \{a_{21}, a_{32}\} \\
 &O(S_7) = \{a_{2132}\} \\
 &S_8 \\
 &C(S_8) = \{a_{2232}\} \\
 &R(S_8) = \{a_{22}, a_{32}\} \\
 &I(S_8) = \{a_{22}, a_{32}\} \\
 &O(S_8) = \{a_{2232}\} \\
 &S_9 \\
 &C(S_9) = \{A_{13}\} \\
 &R(S_9) = \{a_{2132}, a_{2232}\} \\
 &I(S_9) = \emptyset \\
 &O(S_9) = \{A_{13}\} \\
 &S_{10} \\
 &C(S_{10}) = \{aA_{1111}\} \\
 &R(S_{10}) = \{a_{11}, A_{11}\} \\
 &I(S_{10}) = \{a_{11}\} \\
 &O(S_{10}) = \{aA_{1111}\} \\
 &S_{11} \\
 &C(S_{11}) = \{aA_{1212}\} \\
 &R(S_{11}) = \{a_{12}, A_{12}\} \\
 &I(S_{11}) = \{a_{12}\} \\
 &O(S_{11}) = \{aA_{1212}\} \\
 &S_{12} \\
 &C(S_{12}) = \{aA_{1313}\} \\
 &R(S_{12}) = \{a_{13}, A_{13}\} \\
 &I(S_{12}) = \{a_{13}\}
 \end{aligned}$$

$$\begin{aligned}
O(S_{12}) &= \{aA_{1313}\} \\
S_{13} \\
C(S_{13}) &= \{\Delta\} \\
R(S_{13}) &= \{aA_{1111}, aA_{1212}, aA_{1313}\} \\
I(S_{13}) &= \emptyset \\
O(S_{13}) &= \{\Delta\} \\
S_{14} \\
C(S_{14}) &= \{a_{1233}\} \\
R(S_{14}) &= \{a_{12}, a_{33}\} \\
I(S_{14}) &= \{a_{12}, a_{33}\} \\
O(S_{14}) &= \{a_{1233}\} \\
S_{15} \\
C(S_{15}) &= \{a_{1332}\} \\
R(S_{15}) &= \{a_{13}, a_{32}\} \\
I(S_{15}) &= \{a_{13}, a_{32}\} \\
O(S_{15}) &= \{a_{1332}\} \\
S_{16} \\
C(S_{16}) &= \{A_{21}\} \\
R(S_{16}) &= \{a_{1233}, a_{1332}\} \\
I(S_{16}) &= \emptyset \\
O(S_{16}) &= \{A_{21}\} \\
S_{17} \\
C(S_{17}) &= \{a_{1133}\} \\
R(S_{17}) &= \{a_{11}, a_{33}\} \\
I(S_{17}) &= \{a_{11}, a_{33}\} \\
O(S_{17}) &= \emptyset \\
S_{18} \\
C(S_{18}) &= \{a_{1331}\} \\
R(S_{18}) &= \{a_{13}, a_{31}\} \\
I(S_{18}) &= \{a_{13}, a_{31}\} \\
O(S_{18}) &= \{a_{1331}\} \\
S_{19} \\
C(S_{19}) &= \{A_{22}\} \\
R(S_{19}) &= \{a_{1133}, a_{1331}\} \\
I(S_{19}) &= \emptyset \\
O(S_{19}) &= \{A_{22}\} \\
S_{20} \\
C(S_{20}) &= \{a_{1133}\} \\
R(S_{20}) &= \{a_{11}, a_{33}\} \\
I(S_{20}) &= \{a_{11}, a_{33}\} \\
O(S_{20}) &= \{a_{1133}\} \\
S_{21} \\
C(S_{21}) &= \{a_{1231}\} \\
R(S_{21}) &= \{a_{12}, a_{31}\} \\
I(S_{21}) &= \{a_{12}, a_{31}\} \\
O(S_{21}) &= \{a_{1231}\} \\
S_{22} \\
C(S_{22}) &= \{A_{23}\} \\
R(S_{22}) &= \{a_{1133}, a_{1231}\} \\
I(S_{22}) &= \emptyset \\
O(S_{22}) &= \{A_{23}\} \\
S_{23} \\
C(S_{23}) &= \{a_{1223}\} \\
R(S_{23}) &= \{a_{12}, a_{23}\} \\
I(S_{23}) &= \{a_{12}, a_{23}\} \\
O(S_{23}) &= \{a_{1223}\} \\
S_{24} \\
C(S_{24}) &= \{a_{1322}\} \\
R(S_{24}) &= \{a_{13}, a_{22}\} \\
I(S_{24}) &= \{a_{13}, a_{22}\} \\
O(S_{24}) &= \{a_{1322}\}
\end{aligned}$$

$$\begin{aligned}
&S_{25} \\
&C(S_{25}) = \{A_{31}\} \\
&R(S_{25}) = \{a_{1223}, a_{1322}\} \\
&I(S_{25}) = \emptyset \\
&O(S_{25}) = \{A_{31}\} \\
&S_{26} \\
&C(S_{26}) = \{a_{1123}\} \\
&R(S_{26}) = \{a_{11}, a_{23}\} \\
&I(S_{26}) = \{a_{11}, a_{23}\} \\
&O(S_{26}) = \{a_{1123}\} \\
&S_{27} \\
&C(S_{27}) = \{a_{1321}\} \\
&R(S_{27}) = \{a_{13}, a_{21}\} \\
&I(S_{27}) = \{a_{13}, a_{21}\} \\
&O(S_{27}) = \{a_{1321}\} \\
&S_{28} \\
&C(S_{28}) = \{A_{32}\} \\
&R(S_{28}) = \{a_{1123}, a_{1321}\} \\
&I(S_{28}) = \emptyset \\
&O(S_{28}) = \{A_{32}\} \\
&S_{29} \\
&C(S_{29}) = \{a_{1122}\} \\
&R(S_{29}) = \{a_{11}, a_{22}\} \\
&I(S_{29}) = \{a_{11}, a_{22}\} \\
&O(S_{29}) = \{a_{1122}\} \\
&S_{30} \\
&C(S_{30}) = \{a_{1221}\} \\
&R(S_{30}) = \{a_{12}, a_{21}\} \\
&I(S_{30}) = \{a_{12}, a_{21}\} \\
&O(S_{30}) = \{a_{1221}\} \\
&S_{31} \\
&C(S_{31}) = \{A_{33}\} \\
&R(S_{31}) = \{a_{1122}, a_{1221}\} \\
&I(S_{31}) = \emptyset \\
&O(S_{31}) = \{A_{33}\} \\
&S_{32} \\
&C(S_{32}) = \{a_{11}^{-1}\} \\
&R(S_{32}) = \{A_{11}, \Delta\} \\
&I(S_{32}) = \emptyset \\
&O(S_{32}) = \{a_{11}^{-1}\} \\
&S_{33} \\
&C(S_{33}) = \{a_{12}^{-1}\} \\
&R(S_{33}) = \{A_{21}, \Delta\} \\
&I(S_{33}) = \emptyset \\
&O(S_{33}) = \{a_{12}^{-1}\} \\
&S_{34} \\
&C(S_{34}) = \{a_{13}^{-1}\} \\
&R(S_{34}) = \{A_{31}, \Delta\} \\
&I(S_{34}) = \emptyset \\
&O(S_{34}) = \{a_{13}^{-1}\} \\
&S_{35} \\
&C(S_{35}) = \{a_{21}^{-1}\} \\
&R(S_{35}) = \{A_{12}, \Delta\} \\
&I(S_{35}) = \emptyset \\
&O(S_{35}) = \{a_{21}^{-1}\} \\
&S_{36} \\
&C(S_{36}) = \{a_{22}^{-1}\} \\
&R(S_{36}) = \{A_{22}, \Delta\} \\
&I(S_{36}) = \emptyset \\
&O(S_{36}) = \{a_{22}^{-1}\} \\
&S_{37}
\end{aligned}$$

$$\begin{aligned}
C(S_{37}) &= \{a_{23}^{-1}\} \\
R(S_{37}) &= \{A_{12}, \Delta\} \\
I(S_{37}) &= \emptyset \\
O(S_{37}) &= \{a_{23}^{-1}\} \\
S_{38} \\
C(S_{38}) &= \{a_{31}^{-1}\} \\
R(S_{38}) &= \{A_{13}, \Delta\} \\
I(S_{38}) &= \emptyset \\
O(S_{38}) &= \{a_{31}^{-1}\} \\
S_{39} \\
C(S_{39}) &= \{a_{32}^{-1}\} \\
R(S_{39}) &= \{A_{23}, \Delta\} \\
I(S_{39}) &= \emptyset \\
O(S_{39}) &= \{a_{32}^{-1}\} \\
S_{40} \\
C(S_{40}) &= \{a_{33}^{-1}\} \\
R(S_{40}) &= \{A_{33}, \Delta\} \\
I(S_{40}) &= \emptyset \\
O(S_{40}) &= \{a_{33}^{-1}\} \\
\bar{y}_1 \\
C(\bar{y}_1) &= \{a_{2233}, a_{2332}\} \\
R(\bar{y}_1) &= \{a_{22}, a_{33}, a_{23}, a_{32}\} \\
I(\bar{y}_1) &= \{a_{22}, a_{33}, a_{23}, a_{32}\} \\
O(\bar{y}_1) &= \{a_{2233}, a_{2332}\} \\
\bar{y}_2 \\
C(\bar{y}_2) &= \{A_{11}, a_{2133}, a_{2331}\} \\
R(\bar{y}_2) &= \{a_{2233}, a_{2332}, a_{21}, a_{33}, a_{23}, a_{31}\} \\
I(\bar{y}_2) &= \{a_{21}, a_{33}, a_{23}, a_{31}\} \\
O(\bar{y}_2) &= \{A_{11}, a_{2133}, a_{2331}\} \\
\bar{y}_3 \\
C(\bar{y}_3) &= \{A_{12}, a_{2132}, a_{2232}\} \\
R(\bar{y}_3) &= \{a_{2133}, a_{2331}, a_{21}, a_{32}, a_{22}\} \\
I(\bar{y}_3) &= \{a_{21}, a_{32}, a_{22}\} \\
O(\bar{y}_3) &= \{A_{12}, a_{2132}, a_{2232}\} \\
\bar{y}_4 \\
C(\bar{y}_4) &= \{A_{13}, aA_{1111}, aA_{1212}\} \\
R(\bar{y}_4) &= \{a_{2132}, a_{2232}, a_{11}, A_{11}, a_{12}, A_{12}\} \\
I(\bar{y}_4) &= \{a_{11}, a_{12}\} \\
O(\bar{y}_4) &= \{A_{13}, aA_{1111}, aA_{1212}\} \\
\bar{y}_5 \\
C(\bar{y}_5) &= \{\Delta, a_{1233}, a_{1332}\} \\
R(\bar{y}_5) &= \{aA_{1111}, aA_{1212}, aA_{1313}, a_{12}, a_{33}, a_{13}, a_{32}\} \\
I(\bar{y}_5) &= \{a_{12}, a_{33}, a_{13}, a_{32}\} \\
O(\bar{y}_5) &= \{\Delta, a_{1233}, a_{1332}\} \\
\bar{y}_6 \\
C(\bar{y}_6) &= \{A_{21}, a_{1133}, a_{1331}\} \\
R(\bar{y}_6) &= \{a_{1233}, a_{1332}, a_{11}, a_{33}, a_{13}, a_{31}\} \\
I(\bar{y}_6) &= \{a_{11}, a_{33}, a_{13}, a_{31}\} \\
O(\bar{y}_6) &= \{A_{21}, a_{1331}\} \\
\bar{y}_7 \\
C(\bar{y}_7) &= \{a_{1133}, a_{1231}\} \\
R(\bar{y}_7) &= \{a_{11}, a_{33}, a_{12}, a_{31}\} \\
I(\bar{y}_7) &= \{a_{11}, a_{33}, a_{12}, a_{31}\} \\
O(\bar{y}_7) &= \{a_{1133}, a_{1231}\} \\
\bar{y}_8 \\
C(\bar{y}_8) &= \{A_{23}, a_{1223}, a_{1322}\} \\
R(\bar{y}_8) &= \{a_{1133}, a_{1231}, a_{12}, a_{23}, a_{13}, a_{22}\} \\
I(\bar{y}_8) &= \{a_{12}, a_{23}, a_{13}, a_{22}\} \\
O(\bar{y}_8) &= \{A_{23}, a_{1223}, a_{1322}\} \\
\bar{y}_9 \\
C(\bar{y}_9) &= \{A_{31}, a_{1123}, a_{1321}\}
\end{aligned}$$

$$\begin{aligned}
R(\bar{y}_9) &= \{a_{1223}, a_{1322}, a_{11}, a_{23}, a_{13}, a_{21}\} \\
I(\bar{y}_9) &= \{a_{11}, a_{23}, a_{13}, a_{21}\} \\
O(\bar{y}_9) &= \{A_{31}, a_{1123}, a_{1321}\} \\
\bar{y}_{10} \\
C(\bar{y}_{10}) &= \{A_{32}, a_{1122}, a_{1221}\} \\
R(\bar{y}_{10}) &= \{a_{1123}, a_{1321}, a_{11}, a_{22}, a_{12}, a_{21}\} \\
I(\bar{y}_{10}) &= \{a_{11}, a_{22}, a_{12}, a_{21}\} \\
O(\bar{y}_{10}) &= \{A_{32}, a_{1122}, a_{1221}\} \\
\bar{y}_{11} \\
C(\bar{y}_{11}) &= \{A_{33}, a_{11}^{-1}, a_{12}^{-1}, a_{13}^{-1}, a_{21}^{-1}, a_{22}^{-1}, a_{23}^{-1}, a_{31}^{-1}, a_{32}^{-1}\} \\
R(\bar{y}_{11}) &= \{a_{1122}, a_{1221}, A_{11}, \Delta, A_{21}, A_{31}, A_{12}, A_{22}, A_{13}, A_{23}\} \\
I(\bar{y}_{11}) &= \emptyset \\
O(\bar{y}_{11}) &= \{A_{33}, a_{11}^{-1}, a_{12}^{-1}, a_{13}^{-1}, a_{21}^{-1}, a_{22}^{-1}, a_{23}^{-1}, a_{31}^{-1}, a_{32}^{-1}\} \\
\bar{y}_1 \\
C(\bar{y}_1) &= \{a_{2233}, a_{2332}, A_{11}, a_{2133}, a_{2331}, A_{12}, a_{2132}, a_{2232}, A_{13}, aA_{1111}, aA_{1212}, aA_{1313}, \Delta, a_{1233}, a_{1332}, A_{21}, a_{1133}, a_{1331}, \\
&A_{22}\} \\
R(\bar{y}_1) &= \{a_{22}, a_{33}, a_{23}, a_{32}, a_{2233}, a_{2332}, a_{21}, a_{31}, a_{2133}, a_{2331}, a_{2132}, a_{2232}, a_{11}, A_{11}, a_{12}, A_{12}, a_{13}, A_{13}, aA_{1111}, aA_{1212}, \\
&aA_{1313}, a_{1233}, a_{1332}, a_{1133}, a_{1331}\} \\
I(\bar{y}_1) &= \{a_{22}, a_{33}, a_{23}, a_{32}, a_{2233}, a_{2332}, a_{21}, a_{31}, a_{2133}, a_{2331}, a_{2132}, a_{2232}, a_{11}, A_{11}, a_{12}, A_{12}, a_{13}, A_{13}, aA_{1111}, aA_{1212}, \\
&aA_{1313}, a_{1233}, a_{1332}, a_{1133}, a_{1331}\} \\
O(\bar{y}_1) &= \{a_{2233}, a_{2332}, A_{11}, a_{2133}, a_{2331}, A_{12}, a_{2132}, a_{2232}, A_{13}, aA_{1111}, aA_{1212}, aA_{1313}, \Delta, a_{1233}, a_{1332}, A_{21}, a_{1331}, A_{22}\} \\
\bar{y}_2 \\
C(\bar{y}_2) &= \{a_{1133}, a_{1231}, A_{23}, a_{1223}, a_{1322}, A_{31}, a_{1123}, a_{1321}, A_{32}, a_{1122}, a_{1221}\} \\
R(\bar{y}_2) &= \{a_{11}, a_{33}, a_{12}, a_{31}, a_{1133}, a_{1231}, a_{23}, a_{13}, a_{22}, a_{1223}, a_{1322}, a_{21}, a_{1123}, a_{1321}\} \\
I(\bar{y}_2) &= \{a_{11}, a_{33}, a_{12}, a_{31}, a_{1231}, a_{23}, a_{13}, a_{22}, a_{1223}, a_{1322}, a_{21}, a_{1123}, a_{1321}\} \\
O(\bar{y}_2) &= \{a_{1133}, a_{1231}, A_{23}, a_{1223}, a_{1322}, A_{31}, a_{1123}, a_{1321}, A_{32}, a_{1122}, a_{1221}\} \\
\bar{y}_3 \\
C(\bar{y}_3) &= \{a_{2233}, a_{2332}, A_{11}, a_{2133}, a_{2331}, A_{12}, a_{2132}, a_{2232}, A_{13}, aA_{1111}, aA_{1212}, aA_{1313}, \Delta, a_{1233}, a_{1332}, A_{21}, a_{1133}, a_{1331}, \\
&A_{22}, a_{1231}, A_{23}, a_{1223}, a_{1322}, A_{31}, a_{1123}, a_{1321}, A_{32}, a_{1122}, a_{1221}, A_{33}, a_{11}^{-1}, a_{12}^{-1}, a_{13}^{-1}, a_{21}^{-1}, a_{22}^{-1}, a_{23}^{-1}, a_{31}^{-1}, a_{32}^{-1}, a_{33}^{-1}\} \\
R(\bar{y}_3) &= \{a_{22}, a_{33}, a_{23}, a_{32}, a_{2233}, a_{2332}, a_{21}, a_{31}, a_{2133}, a_{2331}, a_{2132}, a_{2232}, a_{11}, A_{11}, a_{12}, A_{12}, a_{13}, A_{13}, aA_{1111}, aA_{1212}, \\
&aA_{1313}, a_{1233}, a_{1332}, a_{1133}, a_{1331}, a_{1231}, a_{1223}, a_{1322}, a_{1123}, a_{1321}, a_{1122}, a_{1221}, \Delta, A_{21}, A_{31}, A_{22}, A_{23}, A_{33}\} \\
I(\bar{y}_3) &= \{a_{22}, a_{33}, a_{23}, a_{32}, a_{2233}, a_{2332}, a_{21}, a_{31}, a_{2133}, a_{2331}, a_{2132}, a_{2232}, a_{11}, A_{11}, a_{12}, A_{12}, a_{13}, A_{13}, aA_{1111}, aA_{1212}, \\
&aA_{1313}, a_{1233}, a_{1332}, a_{1133}, a_{1331}, a_{1231}, a_{1223}, a_{1322}, a_{1123}, a_{1321}, a_{1122}, a_{1221}, \Delta, A_{21}, A_{31}, A_{22}, A_{23}, A_{33}\} \\
O(\bar{y}_3) &= \{a_{2233}, a_{2332}, A_{11}, a_{2133}, a_{2331}, A_{12}, a_{2132}, a_{2232}, A_{13}, aA_{1111}, aA_{1212}, aA_{1313}, \Delta, a_{1233}, a_{1332}, A_{21}, a_{1133}, a_{1331}, \\
&A_{22}, a_{1231}, A_{23}, a_{1223}, a_{1322}, A_{31}, a_{1123}, a_{1321}, A_{32}, a_{1122}, a_{1221}, A_{33}, a_{11}^{-1}, a_{12}^{-1}, a_{13}^{-1}, a_{21}^{-1}, a_{22}^{-1}, a_{23}^{-1}, a_{31}^{-1}, a_{32}^{-1}, a_{33}^{-1}\}
\end{aligned}$$