

The detailed information All 120 deadlocks of Fig. 8 Based on The Famous Software “TINA [31]”

Order	Deadlocks
1	$M_1 = 2p_{11} + 4p_{14} + 2p_{18} + p_{19} + p_2 + 2p_3 + 6p_5 + p_6 + 2p_7$
2	$M_2 = p_{11} + 3p_{14} + p_{16} + 2p_{18} + p_{19} + p_2 + 2p_3 + 7p_5 + p_6 + 2p_7$
3	$M_3 = p_1 + p_{11} + 2p_{14} + p_{16} + p_{17} + 2p_{18} + p_{19} + 2p_3 + 7p_5 + p_6 + 2p_7$
4	$M_4 = p_1 + p_{11} + 3p_{14} + p_{16} + 2p_{18} + p_{19} + 2p_3 + 6p_5 + p_6 + 2p_7 + p_8$
5	$M_5 = p_1 + 2p_{11} + 4p_{14} + 2p_{18} + p_{19} + 2p_3 + 5p_5 + p_6 + 2p_7 + p_8$
6	$M_6 = p_1 + p_{11} + p_{12} + 3p_{14} + p_{16} + 2p_{18} + p_{19} + 2p_3 + 6p_5 + p_6 + 2p_7$
7	$M_7 = p_1 + 2p_{11} + p_{12} + 4p_{14} + 2p_{18} + p_{19} + 2p_3 + 5p_5 + p_6 + 2p_7$
8	$M_8 = 3p_1 + p_{11} + 2p_{14} + p_{16} + p_{17} + 2p_{18} + p_{19} + 2p_{24} + 7p_5 + p_6 + 2p_7$
9	$M_9 = p_1 + p_{11} + 3p_{14} + p_{16} + 2p_{18} + p_{19} + p_2 + p_3 + 6p_5 + p_6 + 2p_7 + p_9$
10	$M_{10} = 2p_1 + p_{11} + 2p_{14} + p_{16} + p_{17} + 2p_{18} + p_{19} + p_3 + 6p_5 + p_6 + 2p_7 + p_9$
11	$M_{11} = 2p_1 + p_{11} + 2p_{14} + p_{16} + p_{17} + 2p_{18} + p_{19} + p_{24} + p_3 + 7p_5 + p_6 + 2p_7$
12	$M_{12} = 2p_1 + p_{11} + 3p_{14} + p_{16} + 2p_{18} + p_{19} + p_3 + 5p_5 + p_6 + 2p_7 + p_8 + p_9$
13	$M_{13} = 2p_1 + 2p_{11} + 4p_{14} + 2p_{18} + p_{19} + p_3 + 4p_5 + p_6 + 2p_7 + p_8 + p_9$
14	$M_{14} = 2p_1 + p_{11} + p_{12} + 3p_{14} + p_{16} + 2p_{18} + p_{19} + p_3 + 5p_5 + p_6 + 2p_7 + p_9$
15	$M_{15} = 2p_1 + 2p_{11} + p_{12} + 4p_{14} + 2p_{18} + p_{19} + p_3 + 4p_5 + p_6 + 2p_7 + p_9$
16	$M_{16} = 3p_1 + p_{11} + 2p_{14} + p_{16} + p_{17} + 2p_{18} + p_{19} + p_{24} + 6p_5 + p_6 + 2p_7 + p_9$
17	$M_{17} = 2p_1 + p_{11} + 3p_{14} + p_{16} + 2p_{18} + p_{19} + p_2 + 5p_5 + p_6 + 2p_7 + 2p_9$
18	$M_{18} = 3p_1 + p_{11} + 2p_{14} + p_{16} + p_{17} + 2p_{18} + p_{19} + 5p_5 + p_6 + 2p_7 + 2p_9$
19	$M_{19} = 3p_1 + p_{11} + 3p_{14} + p_{16} + 2p_{18} + p_{19} + 4p_5 + p_6 + 2p_7 + p_8 + 2p_9$
20	$M_{20} = 3p_1 + 2p_{11} + 4p_{14} + 2p_{18} + p_{19} + 3p_5 + p_6 + 2p_7 + p_8 + 2p_9$
21	$M_{21} = 3p_1 + p_{11} + p_{12} + 3p_{14} + p_{16} + 2p_{18} + p_{19} + 4p_5 + p_6 + 2p_7 + 2p_9$
22	$M_{22} = 3p_1 + 2p_{11} + p_{12} + 4p_{14} + 2p_{18} + p_{19} + 3p_5 + p_6 + 2p_7 + 2p_9$
23	$M_{23} = 2p_1 + 2p_{11} + 4p_{14} + 2p_{18} + p_{19} + p_2 + 4p_5 + p_6 + 2p_7 + 2p_9$
24	$M_{24} = 3p_1 + 2p_{11} + 3p_{14} + p_{17} + 2p_{18} + p_{19} + 4p_5 + p_6 + 2p_7 + 2p_9$
25	$M_{25} = p_1 + 2p_{11} + 4p_{14} + 2p_{18} + p_{19} + p_2 + p_3 + 5p_5 + p_6 + 2p_7 + p_9$
26	$M_{26} = p_1 + 2p_{11} + 3p_{14} + p_{17} + 2p_{18} + p_{19} + 2p_3 + 6p_5 + p_6 + 2p_7$
27	$M_{27} = 3p_1 + 2p_{11} + 3p_{14} + p_{17} + 2p_{18} + p_{19} + 2p_{24} + 6p_5 + p_6 + 2p_7$
28	$M_{28} = 2p_1 + 2p_{11} + 3p_{14} + p_{17} + 2p_{18} + p_{19} + p_3 + 5p_5 + p_6 + 2p_7 + p_9$
29	$M_{29} = 2p_1 + 2p_{11} + 3p_{14} + p_{17} + 2p_{18} + p_{19} + p_{24} + p_3 + 6p_5 + p_6 + 2p_7$
30	$M_{30} = 3p_1 + 2p_{11} + 3p_{14} + p_{17} + 2p_{18} + p_{19} + p_{24} + 5p_5 + p_6 + 2p_7 + p_9$
31	$M_{31} = 3p_1 + 2p_{11} + p_{12} + 4p_{14} + 2p_{18} + p_{19} + p_{24} + 4p_5 + p_6 + 2p_7 + p_9$
32	$M_{32} = 3p_1 + 2p_{11} + p_{12} + 4p_{14} + 2p_{18} + p_{19} + 2p_{24} + 5p_5 + p_6 + 2p_7$
33	$M_{33} = 2p_1 + 2p_{11} + p_{12} + 4p_{14} + 2p_{18} + p_{19} + p_{24} + p_3 + 5p_5 + p_6 + 2p_7$
34	$M_{34} = 2p_1 + p_{11} + p_{12} + 3p_{14} + p_{16} + 2p_{18} + p_{19} + p_{24} + p_3 + 6p_5 + p_6 + 2p_7$
35	$M_{35} = p_1 + p_{11} + p_{13} + 4p_{14} + p_{16} + p_{18} + p_{19} + p_2 + p_3 + 5p_5 + p_6 + 2p_7 + p_9$

$$\begin{aligned}
36 \quad M_{36} &= 3p_1+p_{11}+p_{13}+3p_{14}+p_{16}+p_{17}+p_{18}+p_{19}+p_{24}+ 5p_5+ p_6+ 2p_7+p_9 \\
37 \quad M_{37} &= 3p_1+ p_{11}+p_{13}+3p_{14}+p_{16}+p_{17}+ p_{18}+p_{19}+ 2p_{24}+ 6p_5+p_6+ 2p_7 \\
38 \quad M_{38} &= 2p_1+p_{11}+p_{13}+ 4p_{14}+p_{16}+p_{18}+p_{19}+p_2+4p_5+ p_6+2p_7+2p_9 \\
39 \quad M_{39} &= 3p_1+p_{11}+p_{13}+ 3p_{14}+p_{16}+p_{17}+p_{18}+p_{19}+ 4p_5+p_6+2p_7+ 2p_9 \\
40 \quad M_{40} &= 3p_1+p_{11}+p_{13}+ 4p_{14}+p_{16}+p_{18}+p_{19}+ 3p_5+p_6+ 2p_7+p_8+ 2p_9 \\
41 \quad M_{41} &= 3p_1+ 2p_{11}+p_{13}+ 5p_{14}+p_{18}+p_{19}+ 2p_5+p_6+ 2p_7+ p_8+ 2p_9 \\
42 \quad M_{42} &= 3p_1+ p_{11} +p_{12}+ p_{13}+ 4p_{14}+ p_{16}+ p_{18}+ p_{19}+ 3p_5+ p_6+ 2p_7+2p_9 \\
43 \quad M_{43} &= 3p_1+ 2p_{11}+p_{12}+p_{13}+ 5p_{14}+p_{18}+p_{19}+2p_5+p_6+ 2p_7+2p_9 \\
44 \quad M_{44} &= 2p_1+ 2p_{11}+p_{13}+ 5p_{14}+p_{18}+p_{19}+p_2+3p_5+p_6+2p_7+2p_9 \\
45 \quad M_{45} &= p_{11}+p_{13}+ 4p_{14}+p_{16}+p_{18}+p_{19}+ p_2+2p_3+ 6p_5+p_6+2p_7 \\
46 \quad M_{46} &= p_1+ 2p_{11}+p_{13}+ 5p_{14}+p_{18}+p_{19}+p_2+p_3+ 4p_5+ p_6+2p_7+ p_9 \\
47 \quad M_{47} &= 2p_1+ 2p_{11}+p_{13}+ 4p_{14}+p_{17}+p_{18}+p_{19}+p_3+4p_5+p_6+ 2p_7+p_9 \\
48 \quad M_{48} &= 2p_1+2 p_{11}+p_{13}+4p_{14}+p_{17}+p_{18}+p_{19}+p_{24}+p_3+ 5p_5+p_6+2p_7 \\
49 \quad M_{49} &= 2p_1+ 2p_{11}+p_{13}+ 5p_{14}+p_{18}+p_{19}+p_3+3p_5+p_6+2p_7+p_8+p_9 \\
50 \quad M_{50} &= 2p_1+ 2p_{11}+p_{12}+p_{13}+ 5p_{14}+p_{18}+p_{19}+p_3+ 3p_5+p_6+ 2p_7+p_9 \\
51 \quad M_{51} &= 3p_1+ 2p_{11}+p_{13}+4p_{14}+p_{17}+p_{18}+p_{19}+p_{24}+ 4p_5+p_6+2p_7+p_9 \\
52 \quad M_{52} &= 3p_1+2p_{11}+p_{13}+4p_{14}+p_{17}+p_{18}+p_{19}+ 2p_{24}+ 5p_5+p_6+ 2p_7 \\
53 \quad M_{53} &= 3p_1+ 2p_{11}+p_{13}+ 4p_{14}+p_{17}+p_{18}+p_{19}+ 3p_5+p_6+2p_7+ 2p_9 \\
54 \quad M_{54} &= 3p_1+2p_{11}+p_{12}+p_{13}+5p_{14}+p_{18}+p_{19}+p_{24}+3p_5+p_6+2p_7+p_9 \\
55 \quad M_{55} &= 2p_{11}+p_{13}+ 5p_{14}+p_{18}+p_{19}+p_2+ 2p_3+5p_5+p_6+ 2p_7 \\
56 \quad M_{56} &= 3p_1+ 2p_{11}+p_{12}+p_{13}+ 5p_{14}+p_{18}+p_{19}+2p_{24}+ 4p_5+p_6+2p_7 \\
57 \quad M_{57} &= 2p_1+2p_{11}+ p_{12}+p_{13}+5p_{14}+p_{18}+p_{19}+p_{24}+p_3+ 4p_5+p_6+2 p_7 \\
58 \quad M_{58} &= p_1+2p_{11}+p_{13}+ 4p_{14}+p_{17}+p_{18}+p_{19}+2p_3+ 5p_5+p_6+2p_7 \\
59 \quad M_{59} &= p_1+2p_{11}+p_{13}+5p_{14}+p_{18}+p_{19}+2p_3+4p_5+p_6+2 p_7+p_8 \\
60 \quad M_{60} &= p_1+2p_{11}+ p_{12}+p_{13}+ 5p_{14}+p_{18}+p_{19}+2 p_3+ 4p_5+p_6+ 2p_7 \\
61 \quad M_{61} &= p_1+p_{11}+ p_{13}+3p_{14}+p_{16}+p_{17}+p_{18}+p_{19}+2p_3+ 6p_5+p_6+ 2p_7 \\
62 \quad M_{62} &= p_1+ p_{11}+p_{13}+ 4p_{14}+p_{16}+p_{18}+p_{19}+ 2p_3+ 5p_5+p_6+ 2p_7+p_8 \\
63 \quad M_{63} &= 2p_1+p_{11}+p_{13}+3p_{14}+ p_{16}+p_{17}+p_{18}+p_{19}+p_3+ 5p_5+p_6+2p_7+p_9 \\
64 \quad M_{64} &= 2p_1+p_{11}+p_{13}+ 3p_{14}+p_{16}+p_{17}+p_{18}+p_{19}+p_{24}+p_3 +6p_5+p_6+2p_7 \\
65 \quad M_{65} &= 2p_1+p_{11}+p_{13}+4p_{14}+p_{16}+p_{18}+p_{19}+p_3+ 4p_5+p_6+2p_7+p_8+p_9 \\
66 \quad M_{66} &= 2p_{14}+ 2p_{16}+2p_{18}+p_{19}+p_2+ 2p_3+8p_5+p_6+2p_7 \\
67 \quad M_{67} &= 3p_1+p_{14}+ 2p_{16}+p_{17}+ 2p_{18}+p_{19}+2p_{24}+ 8p_5+p_6+ 2p_7 \\
68 \quad M_{68} &= p_1+2p_{14}+ 2p_{16}+ 2p_{18}+p_{19}+p_2+p_3+ 7p_5+p_6+2p_7+p_9 \\
69 \quad M_{69} &= 2p_1+p_{14}+ 2p_{16}+p_{17}+ 2p_{18}+p_{19}+p_3+ 7p_5+p_6+2p_7+p_9 \\
70 \quad M_{70} &= 2p_1+p_{14}+ 2p_{16}+p_{17}+ 2p_{18}+p_{19}+p_{24}+ p_3+8p_5+p_6+ 2p_7 \\
71 \quad M_{71} &= 2p_1+2p_{14}+ 2p_{16}+ 2p_{18}+ p_{19}+p_3+ 6p_5+p_6+ 2p_7+ p_8+p_9 \\
72 \quad M_{72} &= 3p_1+p_{14}+ 2p_{16}+p_{17}+ 2p_{18}+p_{19}+p_{24}+ 7p_5+p_6+ 2p_7+ p_9 \\
73 \quad M_{73} &= 2p_1+ 2p_{14}+ 2p_{16}+2p_{18}+p_{19}+ p_2+6p_5+ p_6+ 2p_7+2p_9
\end{aligned}$$

- 74 $M_{74} = 3p_1+p_{14}+ 2p_{16}+ p_{17}+ 2p_{18}+p_{19}+6p_5+p_6+ 2p_7+ 2p_9$
- 75 $M_{75} = 3p_1+ 2p_{14}+ 2p_{16}+ 2p_{18}+p_{19}+5p_5+p_6+ 2p_7+p_8+ 2p_9$
- 76 $M_{76} = p_1+p_{14}+ 2p_{16}+p_{17}+ 2p_{18}+p_{19}+ 2p_3+ 8p_5+p_6+2p_7$
- 77 $M_{77} = p_1+ 2p_{14}+ 2p_{16}+2p_{18}+p_{19}+ 2p_3+ 7p_5+p_6+2p_7+p_8$
- 78 $M_{78} = 3p_1+p_{11}+ p_{12}+ 3p_{14}+p_{16}+ 2p_{18}+p_{19}+2p_{24}+6p_5+p_6+2p_7$
- 79 $M_{79} = 3p_1+p_{11}+p_{12}+ 3p_{14}+p_{16}+2p_{18}+p_{19}+p_{24}+ 5p_5+p_6+2p_7+p_9$
- 80 $M_{80} = p_{13}+ 3p_{14}+ 2p_{16}+p_{18}+p_{19}+p_2+2p_3+7 p_5+p_6+ 2p_7$
- 81 $M_{81} = 3p_1+p_{13}+2p_{14}+ 2p_{16}+p_{17}+p_{18}+p_{19}+ 2p_{24}+ 7p_5+p_6+2p_7$
- 82 $M_{82} = p_1+p_{13}+ 3p_{14}+ 2p_{16}+p_{18}+ p_{19}+p_2+p_3+ 6p_5+p_6+2p_7+p_9$
- 83 $M_{83} = 2p_1+p_{13}+ 2p_{14}+ 2p_{16}+ p_{17}+p_{18}+p_{19}+p_3+ 6p_5+p_6+ 2p_7+p_9$
- 84 $M_{84} = 2p_1+p_{13}+2p_{14}+2p_{16}+p_{17}+p_{18}+p_{19}+p_{24}+p_3+7p_5+p_6+ 2p_7$
- 85 $M_{85} = 2p_1+ p_{13}+ 3p_{14}+ 2p_{16}+p_{18}+p_{19}+p_3+ 5p_5+p_6+2p_7+p_8+ p_9$
- 86 $M_{86} = 3p_1+p_{13}+2 p_{14}+ 2p_{16}+p_{17}+p_{18}+p_{19}+p_{24}+ 6p_5+p_6+2p_7+ p_9$
- 87 $M_{87} = 2p_1+p_{13}+3p_{14}+ 2p_{16}+p_{18}+p_{19}+p_2+ 5p_5+p_6+2p_7+ 2p_9$
- 88 $M_{88} = 3p_1+p_{13}+2p_{14}+2p_{16}+p_{17}+p_{18}+p_{19}+ 5p_5+ p_6+2p_7+ 2p_9$
- 89 $M_{89} = 3p_1+p_{13}+ 3p_{14}+2p_{16}+p_{18}+p_{19}+4p_5+p_6+2p_7+p_8+2p_9$
- 90 $M_{90} = p_1+p_{13}+2p_{14}+ 2p_{16}+p_{17}+ p_{18}+p_{19}+ 2p_3+ 7p_5+p_6+2p_7$
- 91 $M_{91} = p_1+p_{13}+ 3p_{14}+2p_{16}+p_{18}+p_{19}+ 2p_3+ 6p_5+p_6+ 2p_7+p_8$
- 92 $M_{92} = p_1+p_{11}+p_{12}+p_{13}+4p_{14}+p_{16}+p_{18}+ p_{19}+2p_3+5p_5+ p_6+2p_7$
- 93 $M_{93} = 2p_{11}+ 2p_{13}+6p_{14}+ p_{19}+ p_2+ 2p_3+4p_5+p_6+2p_7$
- 94 $M_{94} = p_1+ 2p_{11}+ 2p_{13}+ 6p_{14}+p_{19}+p_2+p_3+3p_5+p_6+ 2p_7+p_9$
- 95 $M_{95} = 2p_1+ 2p_{11}+2p_{13}+ 6p_{14}+p_{19}+p_3+2p_5+p_6+ 2p_7+p_8+ p_9$
- 96 $M_{96} = 2p_1+2p_{11}+p_{12}+2p_{13}+ 6p_{14}+p_{19}+p_3+ 2p_5+p_6+2p_7+ p_9$
- 97 $M_{97} = 2p_1+2p_{11}+ 2p_{13}+6p_{14}+p_{19}+ p_2+2p_5+p_6+2p_7+2p_9$
- 98 $M_{98} = 3p_1+ 2p_{11}+2p_{13}+6p_{14}+p_{19}+p_5+ p_6+ 2 p_7+p_8+2p_9$
- 99 $M_{99} = 3p_1+2 p_{11}+p_{12}+2p_{13}+6 p_{14}+p_{19}+ p_5+p_6+2 p_7+2p_9$
- 100 $M_{100} = 3p_1+2p_{11}+p_{12}+2p_{13}+ 6p_{14}+p_{19}+p_{24}+ 2p_5+ p_6+2p_7+p_9$
- 101 $M_{101} = 3p_1+2p_{11}+p_{12}+2p_{13}+ 6p_{14}+p_{19}+ 2p_{24}+3p_5+p_6+ 2p_7$
- 102 $M_{102} = 2p_1+ 2p_{11}+p_{12}+ 2p_{13}+6p_{14}+p_{19}+p_{24}+p_3+ 3p_5+p_6+2p_7$
- 103 $M_{103} = p_1+ 2p_{11}+ 2p_{13}+6p_{14}+p_{19}+ 2p_3+3p_5+p_6+ 2p_7+p_8$
- 104 $M_{104} = p_1+2p_{11}+p_{12}+2p_{13}+ 6p_{14}+p_{19}+ 2p_3+3p_5+p_6+2p_7$
- 105 $M_{105} = p_{11}+ 2p_{13}+ 5p_{14}+p_{16}+p_{19}+p_2+2p_3+5p_5+ p_6+ 2p_7$
- 106 $M_{106} = p_1+p_{11}+2p_{13}+5p_{14}+p_{16}+p_{19}+p_2+p_3+4p_5+ p_6+ 2p_7+ p_9$
- 107 $M_{107} = 2p_1+ p_{11}+ 2p_{13}+ 5p_{14}+ p_{16}+ p_{19}+p_3+3p_5+p_6+2p_7+p_8+ p_9$
- 108 $M_{108} = 2p_1+p_{11}+p_{12}+2p_{13}+5p_{14}+p_{16}+p_{19}+p_3+3p_5+ p_6+2p_7+p_9$
- 109 $M_{109} = 2p_1+p_{11}+ 2p_{13}+ 5p_{14}+p_{16}+p_{19}+p_2+ 3p_5+ p_6+2p_7+2p_9$
- 110 $M_{110} = 3p_1+p_{11}+2p_{13}+ 5p_{14}+p_{16}+p_{19}+ 2p_5+p_6+2p_7+p_8+ 2p_9$
- 111 $M_{111} = 3p_1+p_{11}+p_{12}+2p_{13}+5p_{14}+ p_{16}+p_{19}+ 2p_5+p_6+ 2p_7+ 2p_9$

- 112 $M_{112} = 3p_1 + p_{11} + p_{12} + 2p_{13} + 5p_{14} + p_{16} + p_{19} + p_{24} + 3p_5 + p_6 + 2p_7 + p_9$
- 113 $M_{113} = 3p_1 + p_{11} + p_{12} + 2p_{13} + 5p_{14} + p_{16} + p_{19} + 2p_{24} + 4p_5 + p_6 + 2p_7$
- 114 $M_{114} = 2p_1 + p_{11} + p_{12} + 2p_{13} + 5p_{14} + p_{16} + p_{19} + p_{24} + p_3 + 4p_5 + p_6 + 2p_7$
- 115 $M_{115} = p_1 + p_{11} + 2p_{13} + 5p_{14} + p_{16} + p_{19} + 2p_3 + 4p_5 + p_6 + 2p_7 + p_8$
- 116 $M_{116} = p_1 + p_{11} + p_{12} + 2p_{13} + 5p_{14} + p_{16} + p_{19} + 2p_3 + 4p_5 + p_6 + 2p_7$
- 117 $M_{117} = 3p_1 + p_{11} + p_{12} + p_{13} + 4p_{14} + p_{16} + p_{18} + p_{19} + 2p_{24} + 5p_5 + p_6 + 2p_7$
- 118 $M_{118} = 3p_1 + p_{11} + p_{12} + p_{13} + 4p_{14} + p_{16} + p_{18} + p_{19} + p_{24} + 4p_5 + p_6 + 2p_7 + p_9$
- 119 $M_{119} = 2p_1 + p_{11} + p_{12} + p_{13} + 4p_{14} + p_{16} + p_{18} + p_{19} + p_3 + 4p_5 + p_6 + 2p_7 + p_9$
- 120 $M_{120} = 2p_1 + p_{11} + p_{12} + p_{13} + 4p_{14} + p_{16} + p_{18} + p_{19} + p_{24} + p_3 + 5p_5 + p_6 + 2p_7$
-