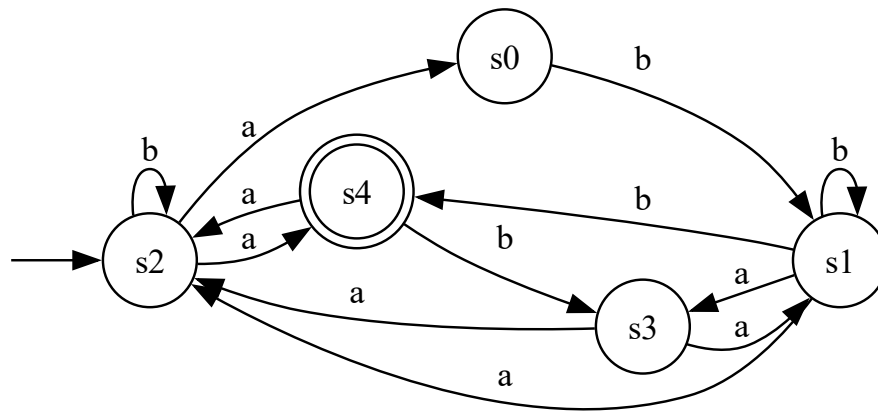# 1 Original NFA

2 Reverse NFA
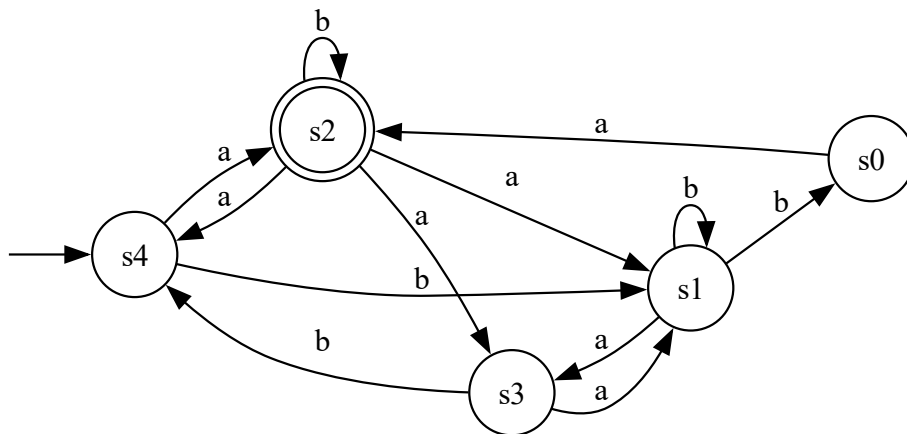
3 DFA
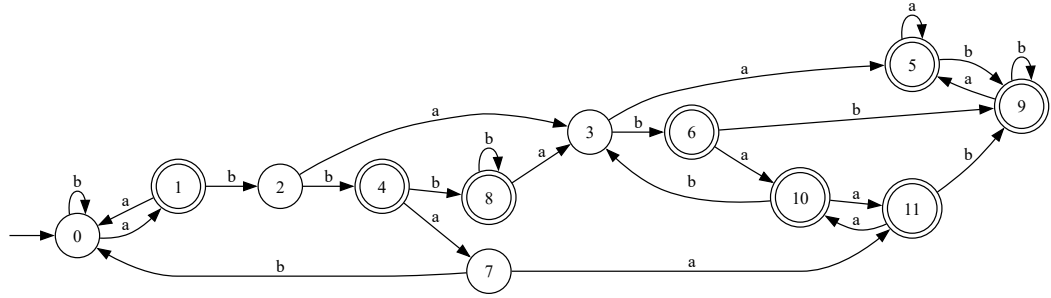
4 Dual of DFA
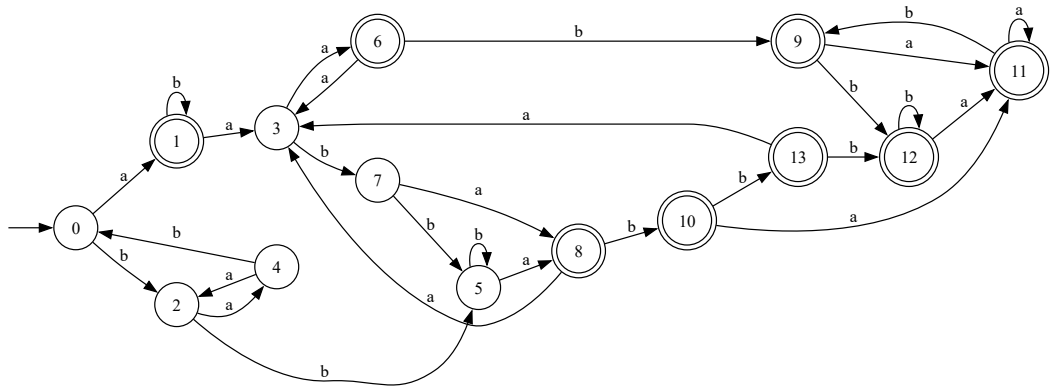
5 States Map Reduction

5.1 States Map 1

	{0}	{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}
{0}	∅	{s2}	∅	∅	∅	∅	{s2}	∅	{s2}	{s2}	{s2}	{s2}	{s2}	{s2}
{1}	{s4}	∅	∅	{s4}	∅	{s0}	∅	{s0, s4}	∅	{s0, s4}	{s4}	{s4}	{s0}	∅
{2}	∅	∅	{s1}	{s1, s3}	{s3}	{s1}	{s1, s3}	{s1}	{s3}	{s1}	∅	{s1, s3}	{s1}	{s1}
{3}	∅	{s2}	{s1}	{s1, s3}	{s3}	{s1}	{s1, s2, s3}	{s1}	{s2, s3}	{s1, s2}	{s2}	{s1, s2, s3}	{s1, s2}	{s1, s2}
{4}	{s4}	∅	{s1}	{s1, s4}	∅	{s1}	{s1}	{s1, s4}	∅	{s1, s4}	{s4}	{s1, s4}	{s1}	{s1}
{5}	{s4}	{s2}	{s1}	{s1, s3, s4}	{s3}	{s0, s1}	{s1, s2, s3}	{s0, s1, s4}	{s2, s3}	{s0, s1, s2, s4}	{s2, s4}	{s1, s2, s3, s4}	{s0, s1, s2}	{s1, s2}
{6}	{s4}	{s2}	{s1}	{s1, s4}	∅	{s1}	{s1, s2}	{s1, s4}	{s2}	{s1, s2, s4}	{s2, s4}	{s1, s2, s4}	{s1, s2}	{s1, s2}
{7}	∅	{s2}	∅	{s3}	{s3}	∅	{s2, s3}	∅	{s2, s3}	{s2}	{s2}	{s2, s3}	{s2}	{s2}
{8}	{s4}	∅	{s1}	{s1, s3, s4}	{s3}	{s1}	{s1, s3}	{s1, s4}	{s3}	{s1, s4}	{s4}	{s1, s3, s4}	{s1}	{s1}
{9}	{s4}	{s2}	{s1}	{s1, s3, s4}	{s3}	{s1}	{s1, s2, s3}	{s1, s4}	{s2, s3}	{s1, s2, s4}	{s2, s4}	{s1, s2, s3, s4}	{s1, s2}	{s1, s2}
{10}	{s4}	{s2}	∅	{s3, s4}	{s3}	{s0}	{s2, s3}	{s0, s4}	{s2, s3}	{s0, s2, s4}	{s2, s4}	{s2, s3, s4}	{s0, s2}	{s2}
{11}	{s4}	{s2}	{s1}	{s1, s4}	∅	{s0, s1}	{s1, s2}	{s0, s1, s4}	{s2}	{s0, s1, s2, s4}	{s2, s4}	{s1, s2, s4}	{s0, s1, s2}	{s1, s2}

5.2 States Map 2

	{0}	{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}
{0}	∅	{s2}	∅	∅	∅	∅	{s2}	∅	{s2}	{s2}	{s2}	{s2}	{s2}	{s2}
{1}	{s4}	∅	∅	{s4}	∅	{s0}	∅	{s0, s4}	∅	{s0, s4}	{s4}	{s4}	{s0}	∅
{2}	∅	∅	{s1}	{s1, s3}	{s3}	{s1}	{s1, s3}	{s1}	{s3}	{s1}	∅	{s1, s3}	{s1}	{s1}
{3}	∅	{s2}	{s1}	{s1, s3}	{s3}	{s1}	{s1, s2, s3}	{s1}	{s2, s3}	{s1, s2}	{s2}	{s1, s2, s3}	{s1, s2}	{s1, s2}
{4}	{s4}	∅	{s1}	{s1, s4}	∅	{s1}	{s1}	{s1, s4}	∅	{s1, s4}	{s4}	{s1, s4}	{s1}	{s1}
{5}	{s4}	{s2}	{s1}	{s1, s3, s4}	{s3}	{s0, s1}	{s1, s2, s3}	{s0, s1, s4}	{s2, s3}	{s0, s1, s2, s4}	{s2, s4}	{s1, s2, s3, s4}	{s0, s1, s2}	{s1, s2}
{6}	{s4}	{s2}	{s1}	{s1, s4}	∅	{s1}	{s1, s2}	{s1, s4}	{s2}	{s1, s2, s4}	{s2, s4}	{s1, s2, s4}	{s1, s2}	{s1, s2}
{7}	∅	{s2}	∅	{s3}	{s3}	∅	{s2, s3}	∅	{s2, s3}	{s2}	{s2}	{s2, s3}	{s2}	{s2}
{8}	{s4}	∅	{s1}	{s1, s3, s4}	{s3}	{s1}	{s1, s3}	{s1, s4}	{s3}	{s1, s4}	{s4}	{s1, s3, s4}	{s1}	{s1}
{9}	{s4}	{s2}	{s1}	{s1, s3, s4}	{s3}	{s1}	{s1, s2, s3}	{s1, s4}	{s2, s3}	{s1, s2, s4}	{s2, s4}	{s1, s2, s3, s4}	{s1, s2}	{s1, s2}
{10}	{s4}	{s2}	∅	{s3, s4}	{s3}	{s0}	{s2, s3}	{s0, s4}	{s2, s3}	{s0, s2, s4}	{s2, s4}	{s2, s3, s4}	{s0, s2}	{s2}
{11}	{s4}	{s2}	{s1}	{s1, s4}	∅	{s0, s1}	{s1, s2}	{s0, s1, s4}	{s2}	{s0, s1, s2, s4}	{s2, s4}	{s1, s2, s4}	{s0, s1, s2}	{s1, s2}

5.3 States Map 3

	{0}	{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}
{0}	∅	{s2}	∅	∅	∅	∅	{s2}	∅	{s2}	{s2}	{s2}	{s2}	{s2}	{s2}
{1}	{s4}	∅	∅	{s4}	∅	{s0}	∅	{s0,s4}	∅	{s0,s4}	{s4}	{s4}	{s0}	∅
{2}	∅	∅	{s1}	{s1,s3}	{s3}	{s1}	{s1,s3}	{s1}	{s3}	{s1}	∅	{s1,s3}	{s1}	{s1}
{3}	∅	{s2}	{s1}	{s1,s3}	{s3}	{s1}	{s1,s2,s3}	{s1}	{s2,s3}	{s1,s2}	{s2}	{s1,s2,s3}	{s1,s2}	{s1,s2}
{4}	{s4}	∅	{s1}	{s1,s4}	∅	{s1}	{s1}	{s1,s4}	∅	{s1,s4}	{s4}	{s1,s4}	{s1}	{s1}
{5,9}	{s4}	{s2}	{s1}	{s1,s3,s4}	{s3}	{s0,s1}	{s1,s2,s3}	{s0,s1,s4}	{s2,s3}	{s0,s1,s2,s4}	{s2,s4}	{s1,s2,s3,s4}	{s0,s1,s2}	{s1,s2}
{6}	{s4}	{s2}	{s1}	{s1,s4}	∅	{s1}	{s1,s2}	{s1,s4}	{s2}	{s1,s2,s4}	{s2,s4}	{s1,s2,s4}	{s1,s2}	{s1,s2}
{7}	∅	{s2}	∅	{s3}	{s3}	∅	{s2,s3}	∅	{s2,s3}	{s2}	{s2}	{s2,s3}	{s2}	{s2}
{8}	{s4}	∅	{s1}	{s1,s3,s4}	{s3}	{s1}	{s1,s3}	{s1,s4}	{s3}	{s1,s4}	{s4}	{s1,s3,s4}	{s1}	{s1}
{10}	{s4}	{s2}	∅	{s3,s4}	{s3}	{s0}	{s2,s3}	{s0,s4}	{s2,s3}	{s0,s2,s4}	{s2,s4}	{s2,s3,s4}	{s0,s2}	{s2}
{11}	{s4}	{s2}	{s1}	{s1,s4}	∅	{s0,s1}	{s1,s2}	{s0,s1,s4}	{s2}	{s0,s1,s2,s4}	{s2,s4}	{s1,s2,s4}	{s0,s1,s2}	{s1,s2}

5.4 States Map 4

	{0}	{1}	{2}	{3}	{4}	{5}	{6}	{7}	{8}	{9}	{10}	{11}	{12}	{13}
{0}	∅	{s2}	∅	∅	∅	∅	{s2}	∅	{s2}	{s2}	{s2}	{s2}	{s2}	{s2}
{1}	{s4}	∅	∅	{s4}	∅	{s0}	∅	{s0,s4}	∅	{s0,s4}	{s4}	{s4}	{s0}	∅
{2}	∅	∅	{s1}	{s1,s3}	{s3}	{s1}	{s1,s3}	{s1}	{s3}	{s1}	∅	{s1,s3}	{s1}	{s1}
{3}	∅	{s2}	{s1}	{s1,s3}	{s3}	{s1}	{s1,s2,s3}	{s1}	{s2,s3}	{s1,s2}	{s2}	{s1,s2,s3}	{s1,s2}	{s1,s2}
{4}	{s4}	∅	{s1}	{s1,s4}	∅	{s1}	{s1}	{s1,s4}	∅	{s1,s4}	{s4}	{s1,s4}	{s1}	{s1}
{5,9}	{s4}	{s2}	{s1}	{s1,s3,s4}	{s3}	{s0,s1}	{s1,s2,s3}	{s0,s1,s4}	{s2,s3}	{s0,s1,s2,s4}	{s2,s4}	{s1,s2,s3,s4}	{s0,s1,s2}	{s1,s2}
{11,6}	{s4}	{s2}	{s1}	{s1,s4}	∅	{s0,s1}	{s1,s2}	{s0,s1,s4}	{s2}	{s0,s1,s2,s4}	{s2,s4}	{s1,s2,s4}	{s0,s1,s2}	{s1,s2}
{7}	∅	{s2}	∅	{s3}	{s3}	∅	{s2,s3}	∅	{s2,s3}	{s2}	{s2}	{s2,s3}	{s2}	{s2}
{8}	{s4}	∅	{s1}	{s1,s3,s4}	{s3}	{s1}	{s1,s3}	{s1,s4}	{s3}	{s1,s4}	{s4}	{s1,s3,s4}	{s1}	{s1}
{10}	{s4}	{s2}	∅	{s3,s4}	{s3}	{s0}	{s2,s3}	{s0,s4}	{s2,s3}	{s0,s2,s4}	{s2,s4}	{s2,s3,s4}	{s0,s2}	{s2}

5.5 States Map 5

	{0}	{1}	{2}	{3}	{4}	{5,7}	{6}	{8}	{9}	{10}	{11}	{12}	{13}
{0}	∅	{s2}	∅	∅	∅	∅	{s2}	{s2}	{s2}	{s2}	{s2}	{s2}	{s2}
{1}	{s4}	∅	∅	{s4}	∅	{s0,s4}	∅	∅	{s0,s4}	{s4}	{s4}	{s0}	∅
{2}	∅	∅	{s1}	{s1,s3}	{s3}	{s1}	{s1,s3}	{s3}	{s1}	∅	{s1,s3}	{s1}	{s1}
{3}	∅	{s2}	{s1}	{s1,s3}	{s3}	{s1}	{s1,s2,s3}	{s2,s3}	{s1,s2}	{s2}	{s1,s2,s3}	{s1,s2}	{s1,s2}
{4}	{s4}	∅	{s1}	{s1,s4}	∅	{s1,s4}	{s1}	∅	{s1,s4}	{s4}	{s1,s4}	{s1}	{s1}
{5,9}	{s4}	{s2}	{s1}	{s1,s3,s4}	{s3}	{s0,s1,s4}	{s1,s2,s3}	{s2,s3}	{s0,s1,s2,s4}	{s2,s4}	{s1,s2,s3,s4}	{s0,s1,s2}	{s1,s2}
{11,6}	{s4}	{s2}	{s1}	{s1,s4}	∅	{s0,s1,s4}	{s1,s2}	{s2}	{s0,s1,s2,s4}	{s2,s4}	{s1,s2,s4}	{s0,s1,s2}	{s1,s2}
{7}	∅	{s2}	∅	{s3}	{s3}	∅	{s2,s3}	{s2,s3}	{s2}	{s2}	{s2,s3}	{s2}	{s2}
{8}	{s4}	∅	{s1}	{s1,s3,s4}	{s3}	{s1,s4}	{s1,s3}	{s3}	{s1,s4}	{s4}	{s1,s3,s4}	{s1}	{s1}
{10}	{s4}	{s2}	∅	{s3,s4}	{s3}	{s0,s4}	{s2,s3}	{s2,s3}	{s0,s2,s4}	{s2,s4}	{s2,s3,s4}	{s0,s2}	{s2}

5.6 States Map 6

	{0}	{1}	{2}	{3}	{4}	{5,7}	{13,6}	{8}	{9}	{10}	{11}	{12}
{0}	∅	{s2}	∅	∅	∅	∅	{s2}	{s2}	{s2}	{s2}	{s2}	{s2}
{1}	{s4}	∅	∅	{s4}	∅	{s0,s4}	∅	∅	{s0,s4}	{s4}	{s4}	{s0}
{2}	∅	∅	{s1}	{s1,s3}	{s3}	{s1}	{s1,s3}	{s3}	{s1}	∅	{s1,s3}	{s1}
{3}	∅	{s2}	{s1}	{s1,s3}	{s3}	{s1}	{s1,s2,s3}	{s2,s3}	{s1,s2}	{s2}	{s1,s2,s3}	{s1,s2}
{4}	{s4}	∅	{s1}	{s1,s4}	∅	{s1,s4}	{s1}	∅	{s1,s4}	{s4}	{s1,s4}	{s1}
{5,9}	{s4}	{s2}	{s1}	{s1,s3,s4}	{s3}	{s0,s1,s4}	{s1,s2,s3}	{s2,s3}	{s0,s1,s2,s4}	{s2,s4}	{s1,s2,s3,s4}	{s0,s1,s2}
{11,6}	{s4}	{s2}	{s1}	{s1,s4}	∅	{s0,s1,s4}	{s1,s2}	{s2}	{s0,s1,s2,s4}	{s2,s4}	{s1,s2,s4}	{s0,s1,s2}
{7}	∅	{s2}	∅	{s3}	{s3}	∅	{s2,s3}	{s2,s3}	{s2}	{s2}	{s2,s3}	{s2}
{8}	{s4}	∅	{s1}	{s1,s3,s4}	{s3}	{s1,s4}	{s1,s3}	{s3}	{s1,s4}	{s4}	{s1,s3,s4}	{s1}
{10}	{s4}	{s2}	∅	{s3,s4}	{s3}	{s0,s4}	{s2,s3}	{s2,s3}	{s0,s2,s4}	{s2,s4}	{s2,s3,s4}	{s0,s2}

5.7 States Map 7

	{0}	{1}	{2}	{3}	{4}	{5,7}	{13,6}	{8}	{11,12,9}	{10}
{0}	∅	{s2}	∅	∅	∅	∅	{s2}	{s2}	{s2}	{s2}
{1}	{s4}	∅	∅	{s4}	∅	{s0,s4}	∅	∅	{s0,s4}	{s4}
{2}	∅	∅	{s1}	{s1,s3}	{s3}	{s1}	{s1,s3}	{s3}	{s1,s3}	∅
{3}	∅	{s2}	{s1}	{s1,s3}	{s3}	{s1}	{s1,s2,s3}	{s2,s3}	{s1,s2,s3}	{s2}
{4}	{s4}	∅	{s1}	{s1,s4}	∅	{s1,s4}	{s1}	∅	{s1,s4}	{s4}
{5,9}	{s4}	{s2}	{s1}	{s1,s3,s4}	{s3}	{s0,s1,s4}	{s1,s2,s3}	{s2,s3}	{s0,s1,s2,s3,s4}	{s2,s4}
{11,6}	{s4}	{s2}	{s1}	{s1,s4}	∅	{s0,s1,s4}	{s1,s2}	{s2}	{s0,s1,s2,s4}	{s2,s4}
{7}	∅	{s2}	∅	{s3}	{s3}	∅	{s2,s3}	{s2,s3}	{s2,s3}	{s2}
{8}	{s4}	∅	{s1}	{s1,s3,s4}	{s3}	{s1,s4}	{s1,s3}	{s3}	{s1,s3,s4}	{s4}
{10}	{s4}	{s2}	∅	{s3,s4}	{s3}	{s0,s4}	{s2,s3}	{s2,s3}	{s0,s2,s3,s4}	{s2,s4}

5.8 States Map 8

	{0}	{1}	{2}	{3}	{4}	{5, 7}	{13, 6}	{8}	{11, 12, 9}	{10}
{0}	∅	{s2}	∅	∅	∅	∅	{s2}	{s2}	{s2}	{s2}
{1}	{s4}	∅	∅	{s4}	∅	{s0, s4}	∅	∅	{s0, s4}	{s4}
{2}	∅	∅	{s1}	{s1, s3}	{s3}	{s1}	{s1, s3}	{s3}	{s1, s3}	∅
{3}	∅	{s2}	{s1}	{s1, s3}	{s3}	{s1}	{s1, s2, s3}	{s2, s3}	{s1, s2, s3}	{s2}
{4}	{s4}	∅	{s1}	{s1, s4}	∅	{s1, s4}	{s1}	∅	{s1, s4}	{s4}
{5, 9}	{s4}	{s2}	{s1}	{s1, s3, s4}	{s3}	{s0, s1, s4}	{s1, s2, s3}	{s2, s3}	{s0, s1, s2, s3, s4}	{s2, s4}
{11, 6}	{s4}	{s2}	{s1}	{s1, s4}	∅	{s0, s1, s4}	{s1, s2}	{s2}	{s0, s1, s2, s4}	{s2, s4}
{7}	∅	{s2}	∅	{s3}	{s3}	∅	{s2, s3}	{s2, s3}	{s2, s3}	{s2}
{8}	{s4}	∅	{s1}	{s1, s3, s4}	{s3}	{s1, s4}	{s1, s3}	{s3}	{s1, s3, s4}	{s4}
{10}	{s4}	{s2}	∅	{s3, s4}	{s3}	{s0, s4}	{s2, s3}	{s2, s3}	{s0, s2, s3, s4}	{s2, s4}

6 Maximal Prime Grids

- Rows: $\{3, 5\}$, Cols: $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

- Rows: $\{0, 1, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{8, 9\}$

- Rows: $\{5\}$, Cols: $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$

- Rows: $\{5, 9\}$, Cols: $\{0, 1, 3, 4, 5, 6, 7, 8, 9\}$

- Rows: $\{5, 6\}$, Cols: $\{0, 1, 2, 3, 5, 6, 7, 8, 9\}$

- Rows: $\{2, 3, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 7, 8\}$

- Rows: $\{5, 6, 8\}$, Cols: $\{0, 2, 3, 5, 6, 7, 8, 9\}$

- Rows: $\{3, 5, 8, 9\}$, Cols: $\{3, 4, 5, 6, 7, 8, 9\}$

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$

- Rows: $\{3, 5, 9\}$, Cols: $\{1, 3, 4, 5, 6, 7, 8, 9\}$

- Rows: $\{2, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{3, 6, 8\}$

- Rows: $\{3, 5, 6, 7, 8, 9\}$, Cols: $\{3, 6, 7, 8, 9\}$

- Rows: $\{5, 8\}$, Cols: $\{0, 2, 3, 4, 5, 6, 7, 8, 9\}$

- Rows: $\{1, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{3, 8, 9\}$

- Rows: $\{2, 3, 5, 6, 7, 8, 9\}$, Cols: $\{3, 6, 7, 8\}$

- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$

- Rows: $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{8\}$

- Rows: $\{3, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 7, 8, 9\}$

- Rows: $\{3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8, 9\}$

- Rows: $\{2, 3, 5, 8, 9\}$, Cols: $\{3, 4, 5, 6, 7, 8\}$

- Rows: $\{3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8, 9\}$

- Rows: $\{4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 6, 8, 9\}$

- Rows: $\{3, 5, 6, 9\}$, Cols: $\{1, 3, 5, 6, 7, 8, 9\}$

- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$

- Rows: $\{2, 3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8\}$

- Rows: $\{3, 5, 6, 7, 9\}$, Cols: $\{1, 3, 6, 7, 8, 9\}$

- Rows: $\{4, 5, 6, 8\}$, Cols: $\{0, 2, 3, 5, 6, 8, 9\}$

- Rows: $\{5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 6, 7, 8, 9\}$
- Rows: $\{3, 4, 5, 6, 8, 9\}$, Cols: $\{3, 5, 6, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 8, 9\}$, Cols: $\{6, 7, 8, 9\}$
- Rows: $\{3, 5, 6, 8, 9\}$, Cols: $\{3, 5, 6, 7, 8, 9\}$
- Rows: $\{3, 5, 7, 9\}$, Cols: $\{1, 3, 4, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 6, 8, 9\}$, Cols: $\{3, 5, 6, 7, 8\}$
- Rows: $\{3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8, 9\}$
- Rows: $\{3, 5, 6\}$, Cols: $\{1, 2, 3, 5, 6, 7, 8, 9\}$
- Rows: $\{5, 8, 9\}$, Cols: $\{0, 3, 4, 5, 6, 7, 8, 9\}$
- Rows: $\{3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{3, 6, 8, 9\}$
- Rows: $\{0, 2, 3, 5, 6, 7, 8, 9\}$, Cols: $\{6, 7, 8\}$
- Rows: $\{2, 3, 4, 5, 6, 8, 9\}$, Cols: $\{3, 5, 6, 8\}$
- Rows: $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{3, 8\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$
- Rows: $\{1, 2, 3, 4, 5, 6, 8, 9\}$, Cols: $\{3, 5, 8\}$
- Rows: $\{0, 2, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{6, 8\}$
- Rows: $\{5, 6, 9\}$, Cols: $\{0, 1, 3, 5, 6, 7, 8, 9\}$
- Rows: $\{1, 3, 4, 5, 6, 8, 9\}$, Cols: $\{3, 5, 8, 9\}$
- Rows: $\{0, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{6, 8, 9\}$

7 Cover Enumeration

7.1 Cover 1

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.2 Cover 2

- Rows: $\{3, 5\}$, Cols: $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$
- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.3 Cover 3

- Rows: $\{0, 1, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{8, 9\}$
- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.4 Cover 4

- Rows: $\{5\}$, Cols: $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$
- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.5 Cover 5

- Rows: $\{5, 9\}$, Cols: $\{0, 1, 3, 4, 5, 6, 7, 8, 9\}$
- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.6 Cover 6

- Rows: $\{5, 6\}$, Cols: $\{0, 1, 2, 3, 5, 6, 7, 8, 9\}$
- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.7 Cover 7

- Rows: $\{2, 3, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 7, 8\}$
- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.8 Cover 8

- Rows: $\{2, 3, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 7, 8\}$
- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{4, 5, 6, 8\}$, Cols: $\{0, 2, 3, 5, 6, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.9 Cover 9

- Rows: $\{2, 3, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 7, 8\}$
- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.10 Cover 10

- Rows: $\{5, 6, 8\}$, Cols: $\{0, 2, 3, 5, 6, 7, 8, 9\}$
- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.11 Cover 11

- Rows: $\{3, 5, 8, 9\}$, Cols: $\{3, 4, 5, 6, 7, 8, 9\}$
- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.12 Cover 12

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{3, 5, 9\}$, Cols: $\{1, 3, 4, 5, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.13 Cover 13

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{3, 6, 8\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.14 Cover 14

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{3, 5, 6, 7, 8, 9\}$, Cols: $\{3, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.15 Cover 15

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{5, 8\}$, Cols: $\{0, 2, 3, 4, 5, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.16 Cover 16

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{1, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{3, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.17 Cover 17

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 5, 6, 7, 8, 9\}$, Cols: $\{3, 6, 7, 8\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.18 Cover 18

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.19 Cover 19

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{3, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 7, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.20 Cover 20

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.21 Cover 21

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{2, 3, 5, 8, 9\}$, Cols: $\{3, 4, 5, 6, 7, 8\}$
- Rows: $\{3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$

7.22 Cover 22

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{2, 3, 5, 8, 9\}$, Cols: $\{3, 4, 5, 6, 7, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{3, 5, 7, 9\}$, Cols: $\{1, 3, 4, 6, 7, 8, 9\}$

7.23 Cover 23

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{2, 3, 5, 8, 9\}$, Cols: $\{3, 4, 5, 6, 7, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.24 Cover 24

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8\}$

7.25 Cover 25

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.26 Cover 26

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 6, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.27 Cover 27

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{3, 5, 6, 9\}$, Cols: $\{1, 3, 5, 6, 7, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.28 Cover 28

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8\}$
- Rows: $\{3, 5, 7, 9\}$, Cols: $\{1, 3, 4, 6, 7, 8, 9\}$

7.29 Cover 29

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.30 Cover 30

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{3, 5, 6, 7, 9\}$, Cols: $\{1, 3, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.31 Cover 31

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{4, 5, 6, 8\}$, Cols: $\{0, 2, 3, 5, 6, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.32 Cover 32

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.33   Cover 33

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{3, 4, 5, 6, 8, 9\}$, Cols: $\{3, 5, 6, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.34   Cover 34

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 8, 9\}$, Cols: $\{6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.35   Cover 35

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{3, 5, 6, 8, 9\}$, Cols: $\{3, 5, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.36   Cover 36

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{3, 5, 7, 9\}$, Cols: $\{1, 3, 4, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

## 7.37   Cover 37

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 6, 8, 9\}$, Cols: $\{3, 5, 6, 7, 8\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.38   Cover 38

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.39 Cover 39

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{3, 5, 6\}$, Cols: $\{1, 2, 3, 5, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.40 Cover 40

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{5, 8, 9\}$, Cols: $\{0, 3, 4, 5, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.41 Cover 41

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{3, 6, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.42 Cover 42

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{0, 2, 3, 5, 6, 7, 8, 9\}$, Cols: $\{6, 7, 8\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.43 Cover 43

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8, 9\}$, Cols: $\{3, 5, 6, 8\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.44 Cover 44

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{3, 8\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.45   Cover 45

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$
- Rows: $\{1, 2, 3, 4, 5, 6, 8, 9\}$, Cols: $\{3, 5, 8\}$

7.46   Cover 46

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$
- Rows: $\{0, 2, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{6, 8\}$

7.47   Cover 47

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$
- Rows: $\{5, 6, 9\}$, Cols: $\{0, 1, 3, 5, 6, 7, 8, 9\}$

7.48   Cover 48

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$
- Rows: $\{1, 3, 4, 5, 6, 8, 9\}$, Cols: $\{3, 5, 8, 9\}$

7.49   Cover 49

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{2, 3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$
- Rows: $\{0, 3, 4, 5, 6, 7, 8, 9\}$, Cols: $\{6, 8, 9\}$

7.50   Cover 50

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8\}$
- Rows: $\{4, 5, 6, 8\}$, Cols: $\{0, 2, 3, 5, 6, 8, 9\}$

7.51 Cover 51

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8\}$
- Rows: $\{3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8, 9\}$

7.52 Cover 52

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8\}$
- Rows: $\{4, 5, 6, 8\}$, Cols: $\{0, 2, 3, 5, 6, 8, 9\}$
- Rows: $\{3, 5, 7, 9\}$, Cols: $\{1, 3, 4, 6, 7, 8, 9\}$

7.53 Cover 53

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8\}$
- Rows: $\{4, 5, 6, 8\}$, Cols: $\{0, 2, 3, 5, 6, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

7.54 Cover 54

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8\}$
- Rows: $\{3, 5, 7, 9\}$, Cols: $\{1, 3, 4, 6, 7, 8, 9\}$
- Rows: $\{3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8, 9\}$

7.55 Cover 55

- Rows: $\{1, 4, 5, 6, 8, 9\}$, Cols: $\{0, 3, 5, 8, 9\}$
- Rows: $\{0, 3, 5, 6, 7, 9\}$, Cols: $\{1, 6, 7, 8, 9\}$
- Rows: $\{2, 3, 5, 8\}$, Cols: $\{2, 3, 4, 5, 6, 7, 8\}$
- Rows: $\{3, 4, 5, 6, 8\}$, Cols: $\{2, 3, 5, 6, 8, 9\}$
- Rows: $\{2, 3, 5, 7, 8, 9\}$, Cols: $\{3, 4, 6, 7, 8\}$

# 8 Intersection Rule Result

8.1 NFA 1
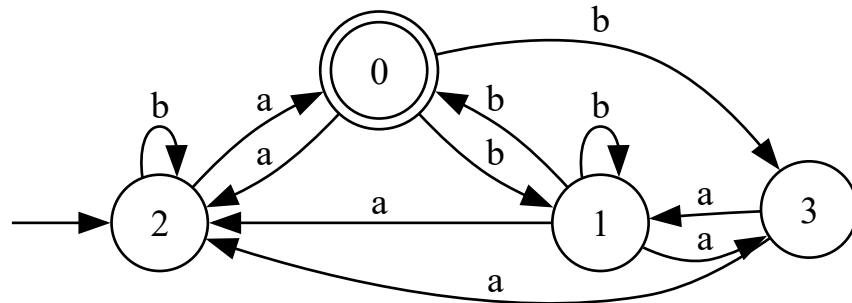
This NFA is legitimate.
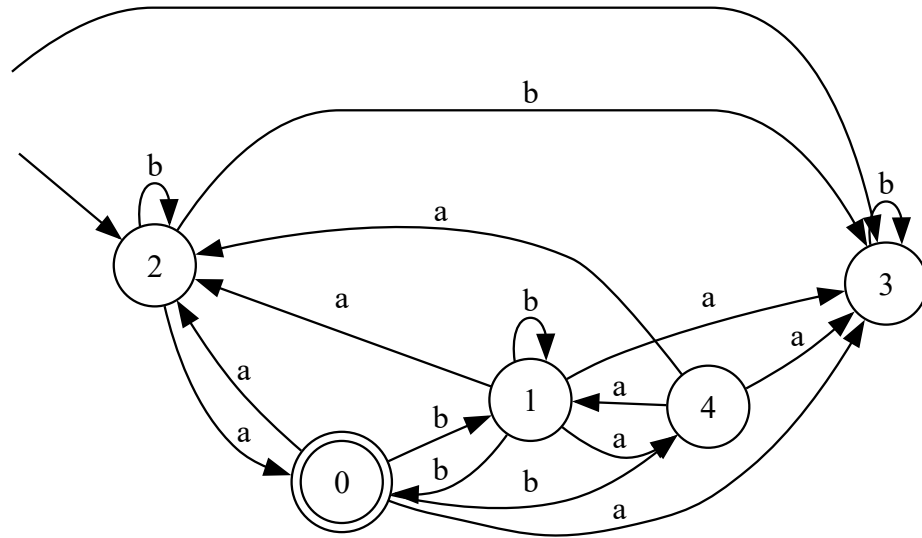
8.2 NFA 2
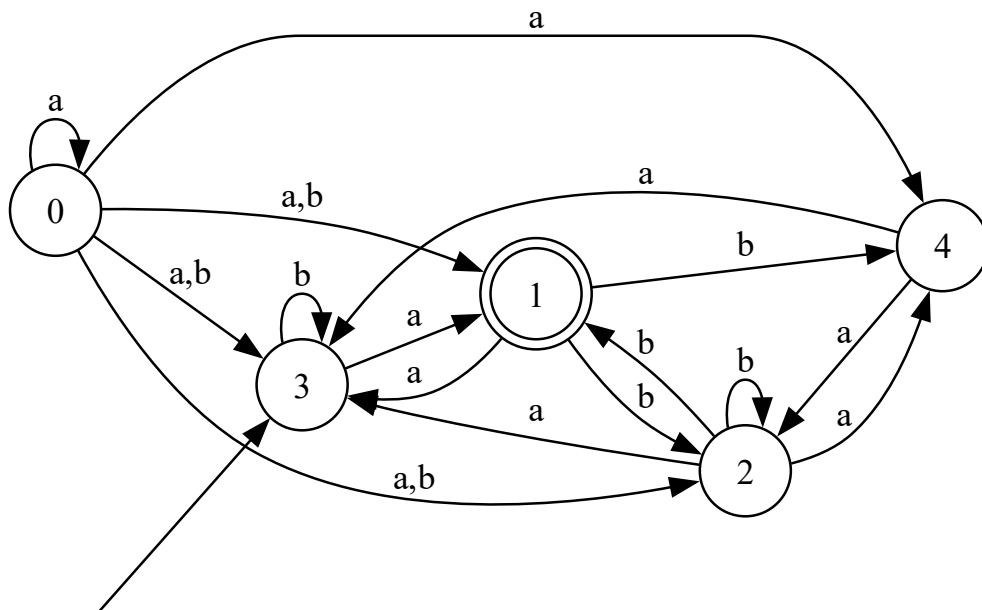
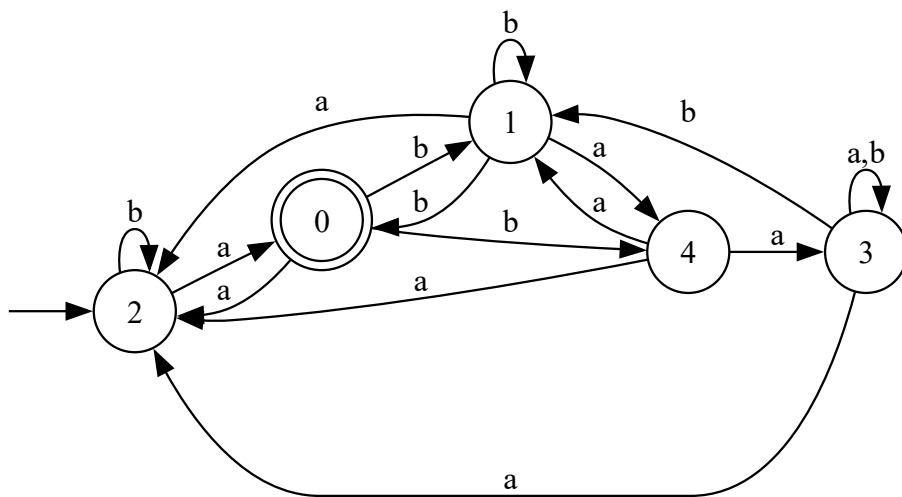This NFA is legitimate.

8.3 NFA 3
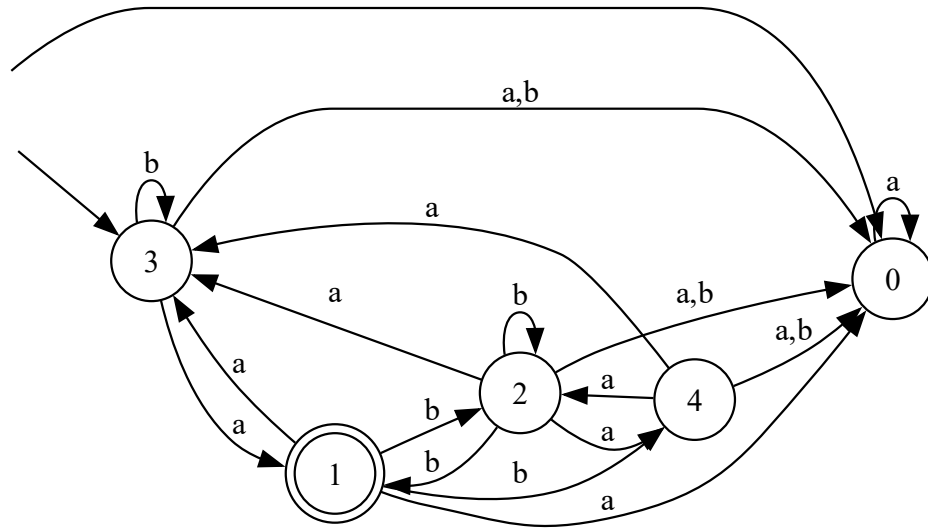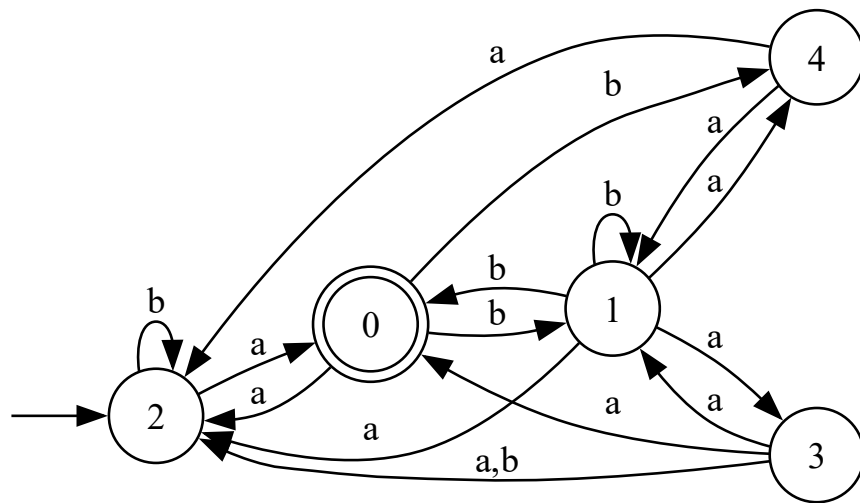

This NFA is legitimate.

8.4 NFA 4
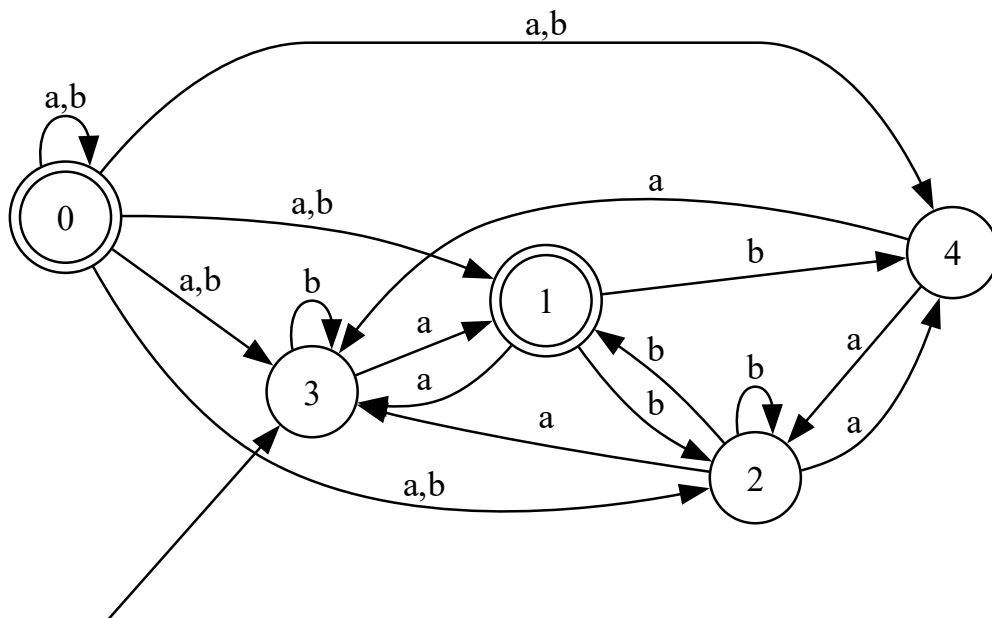
This

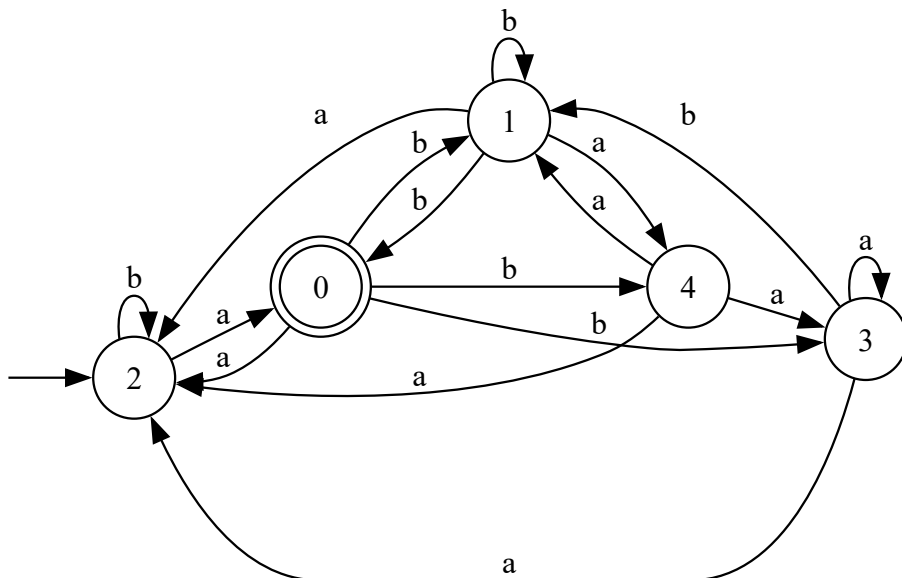NFA is legitimate.

8.5 NFA 5
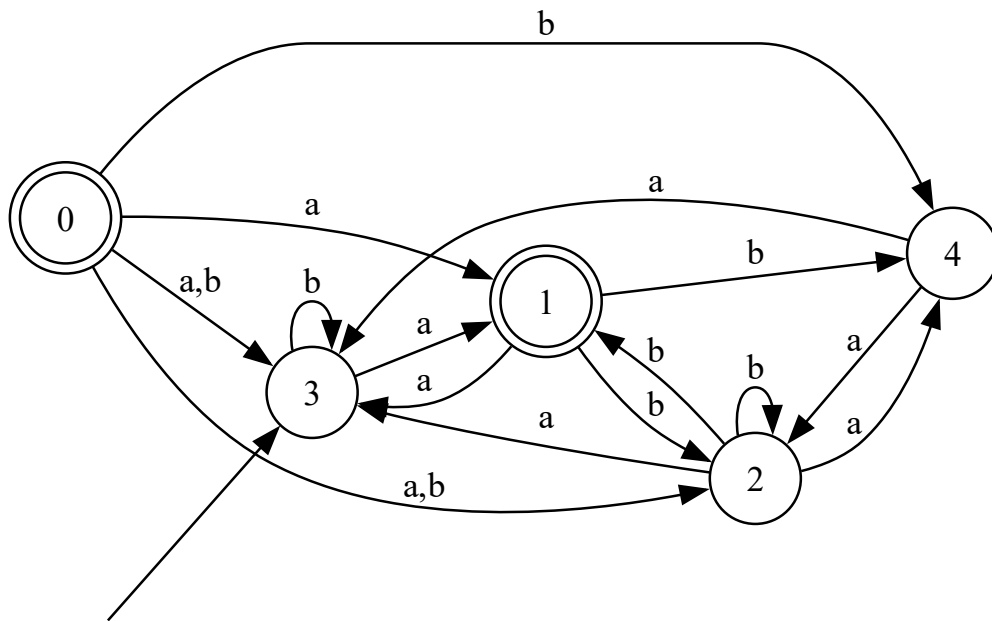
This NFA is legitimate.
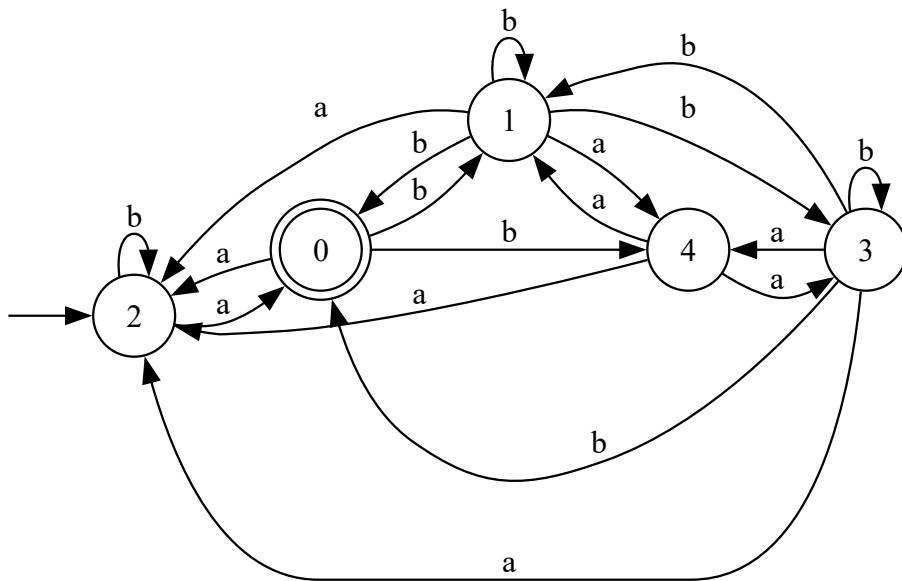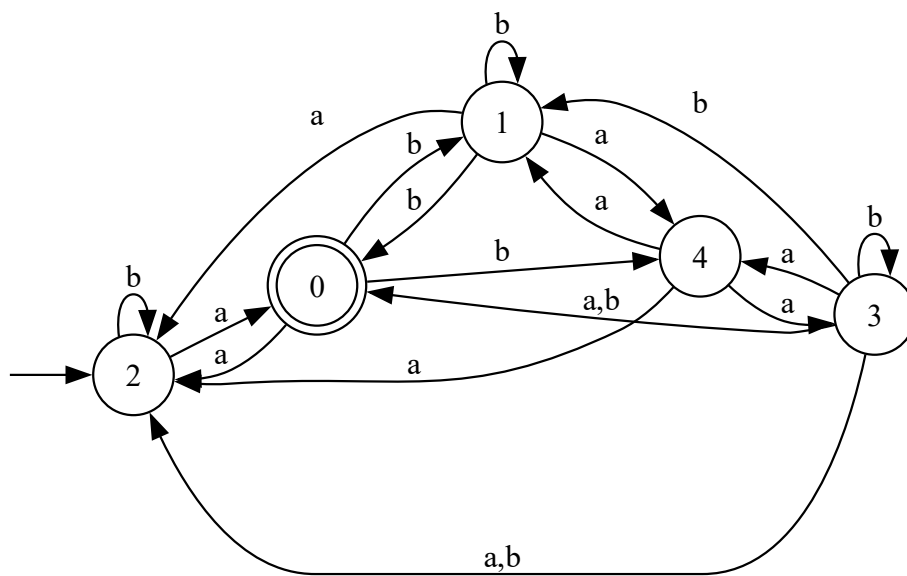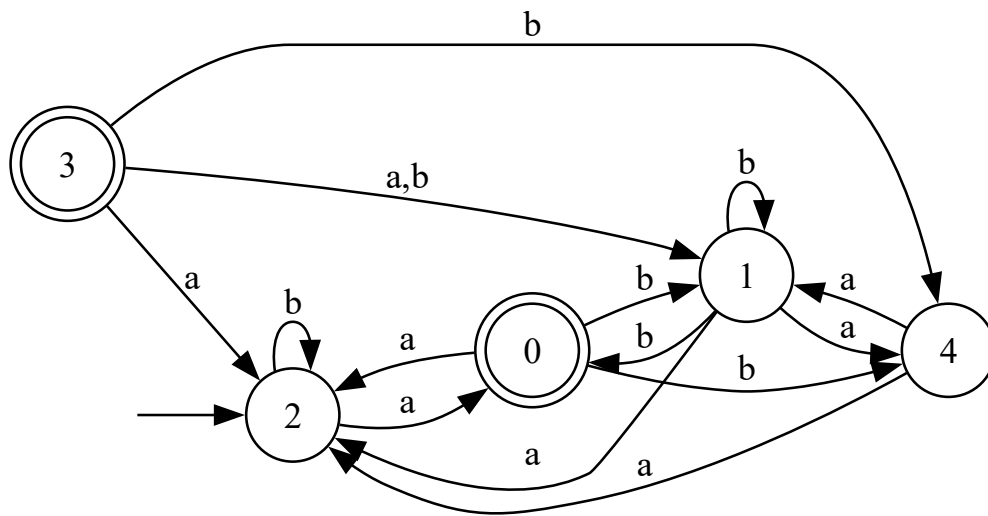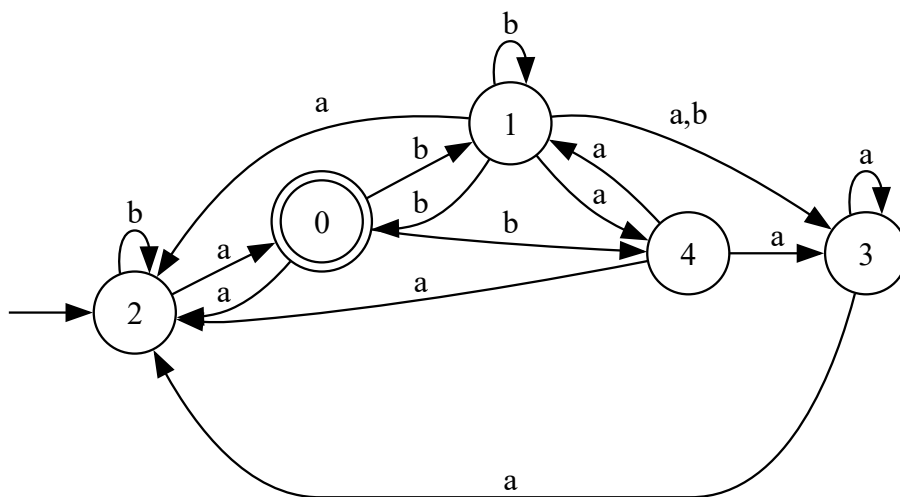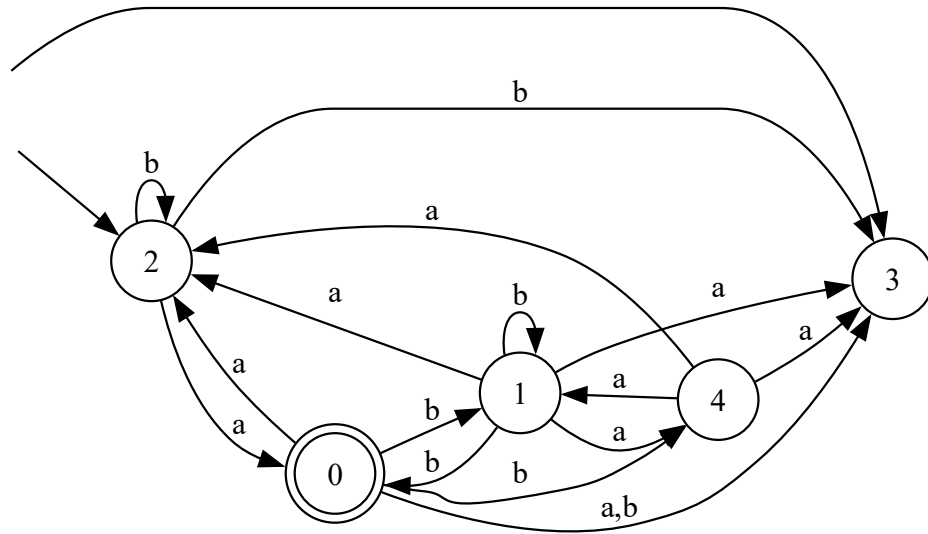
8.6 NFA 6
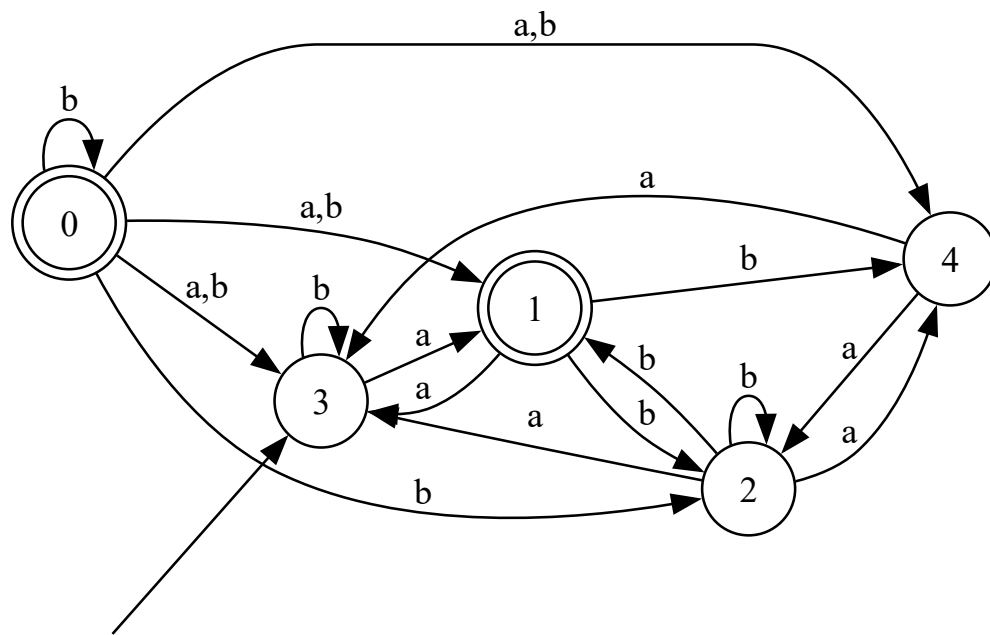
This NFA is legitimate.

8.7 NFA 7
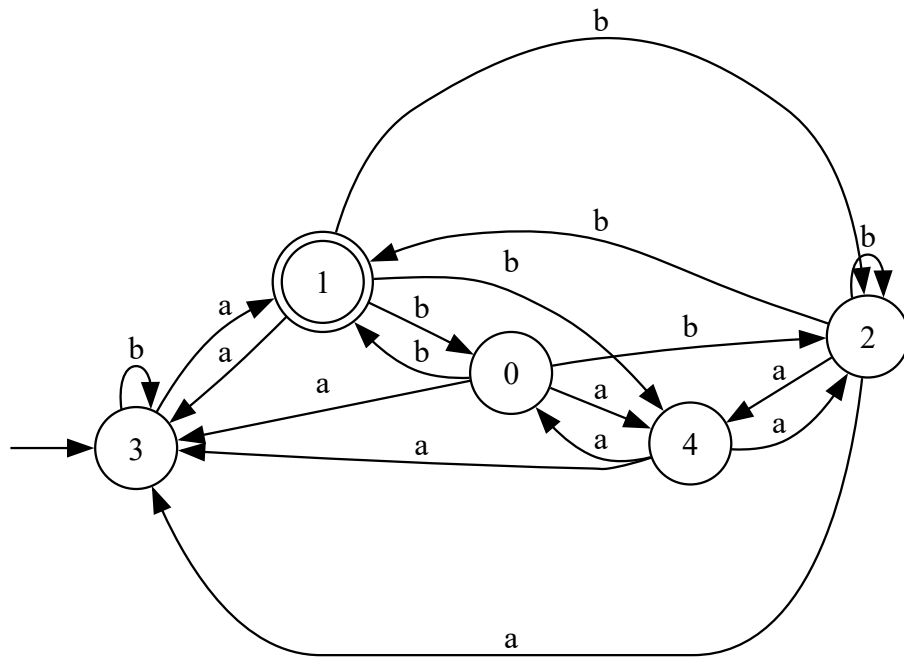
This NFA is legitimate.

8.8 NFA 8
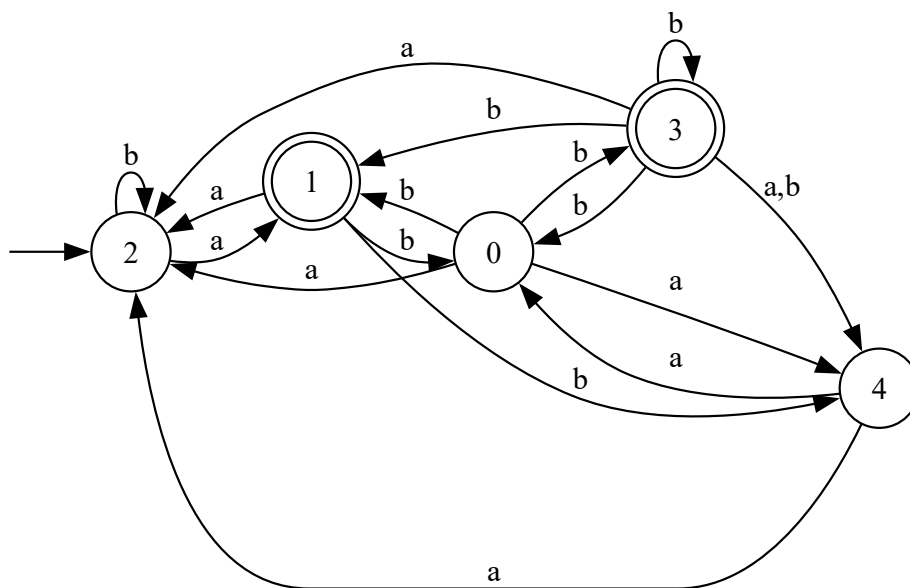
This NFA is legitimate.

8.9   NFA 9
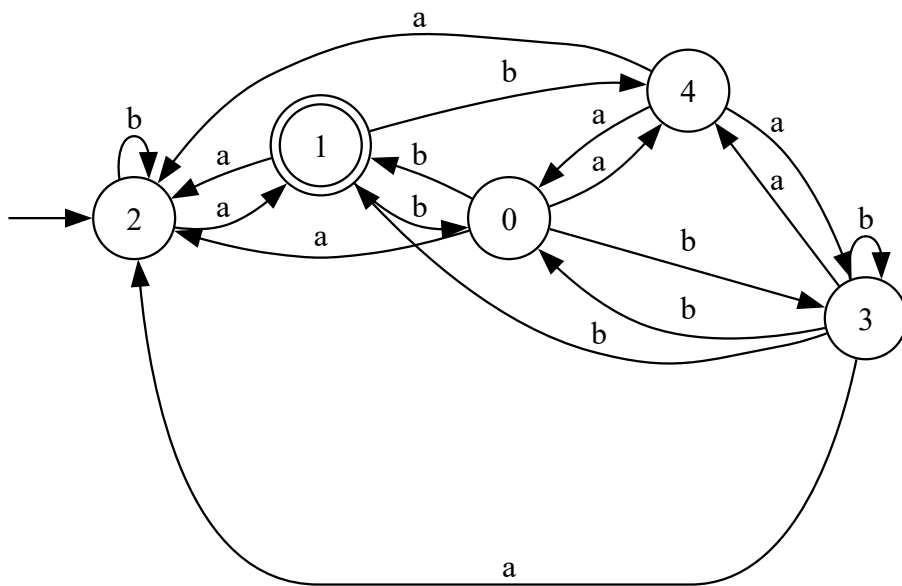
This NFA is legitimate.

8.10 NFA 10
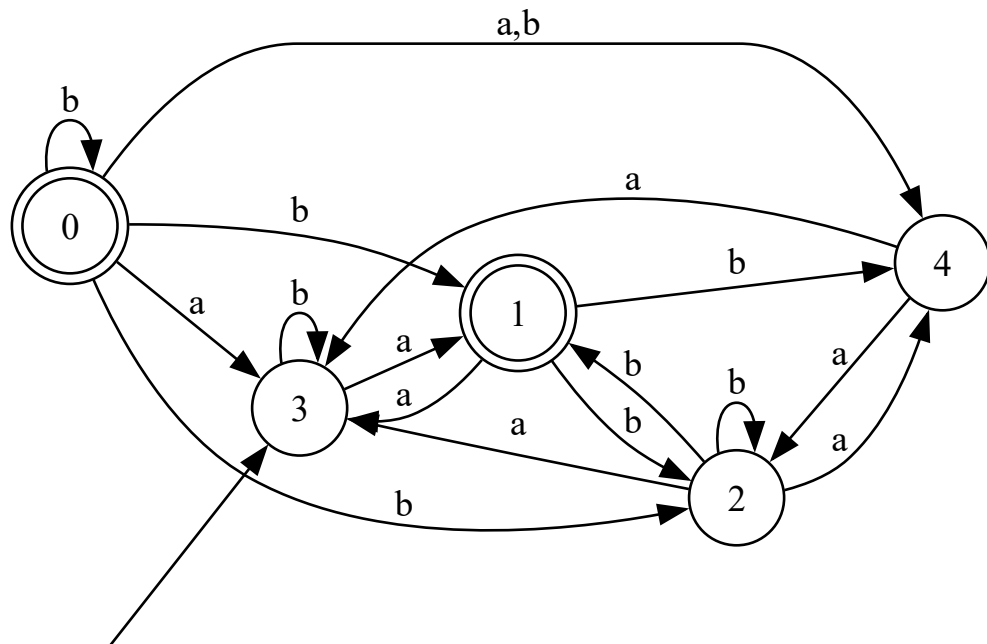
This NFA is legitimate.

8.11 NFA 11
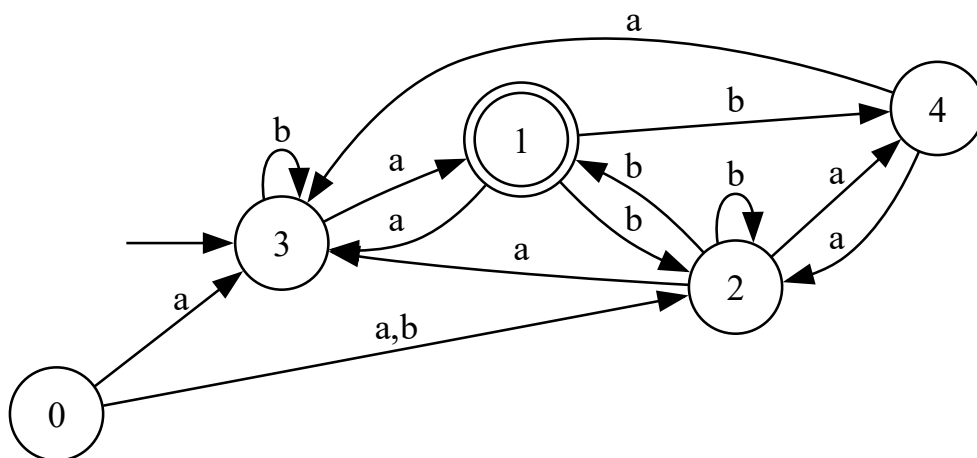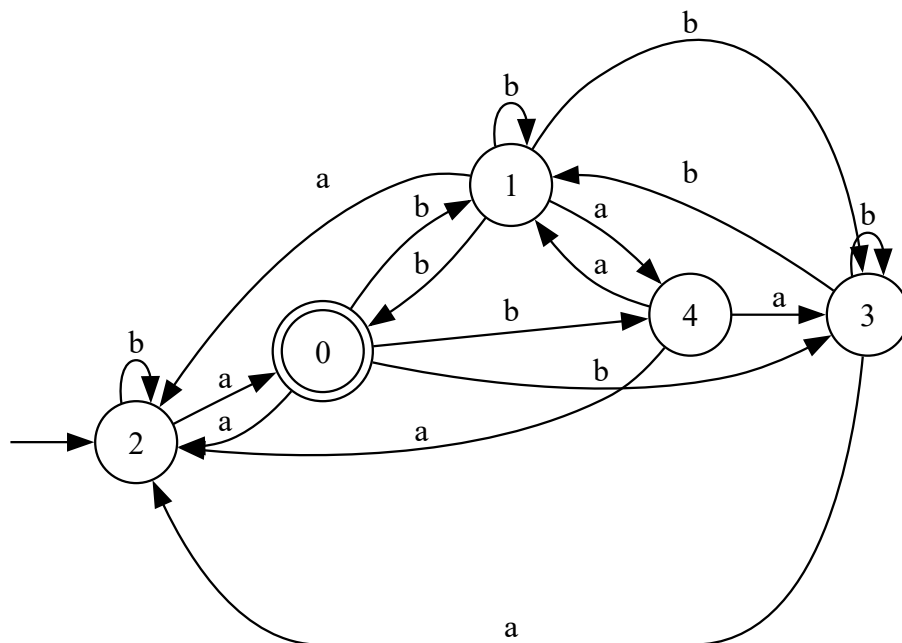

This NFA is legitimate.

8.12   NFA 12
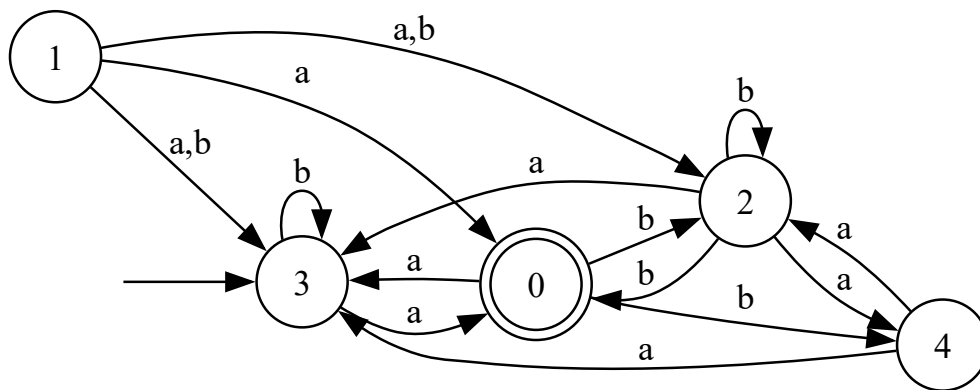
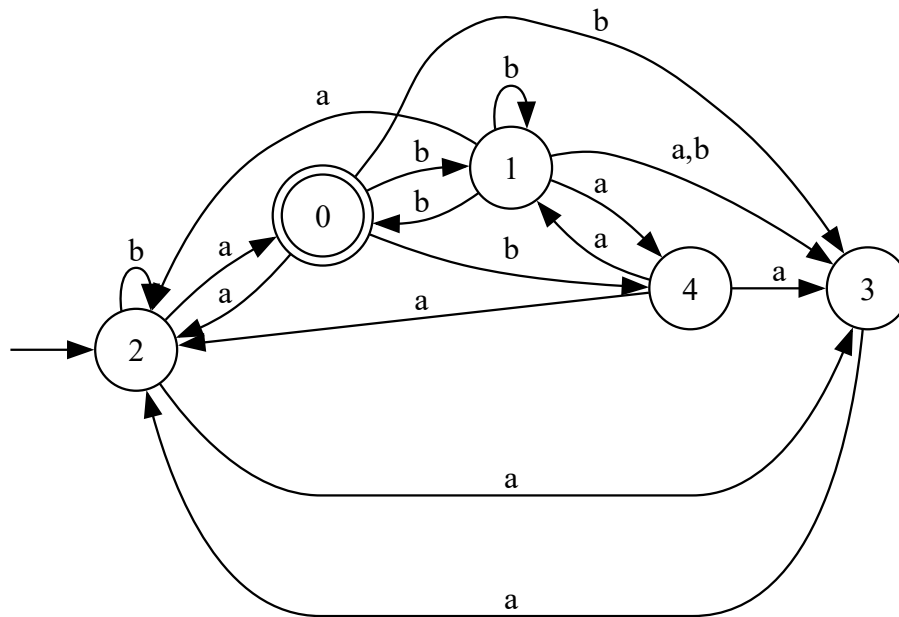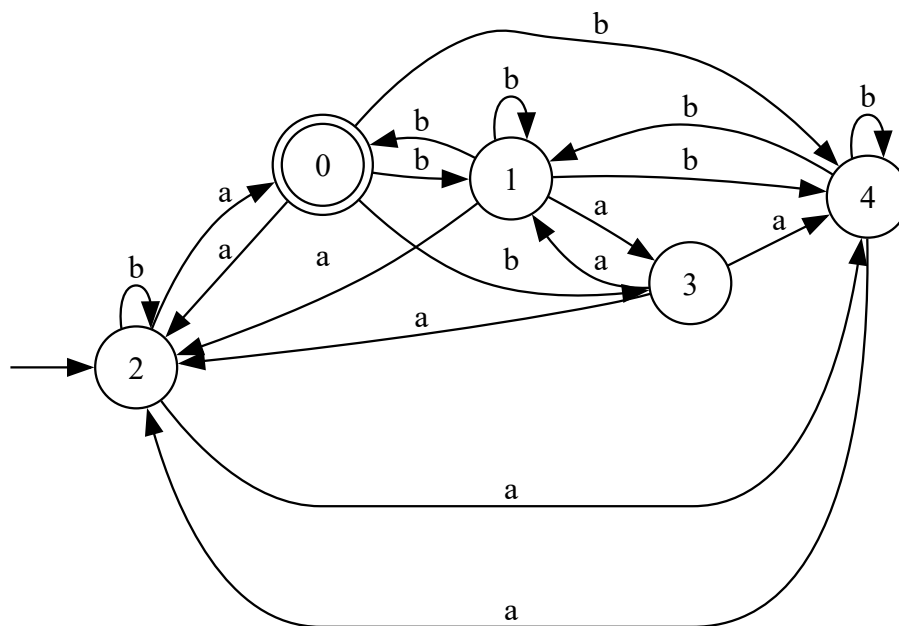This NFA is legitimate.

8.13   NFA 13
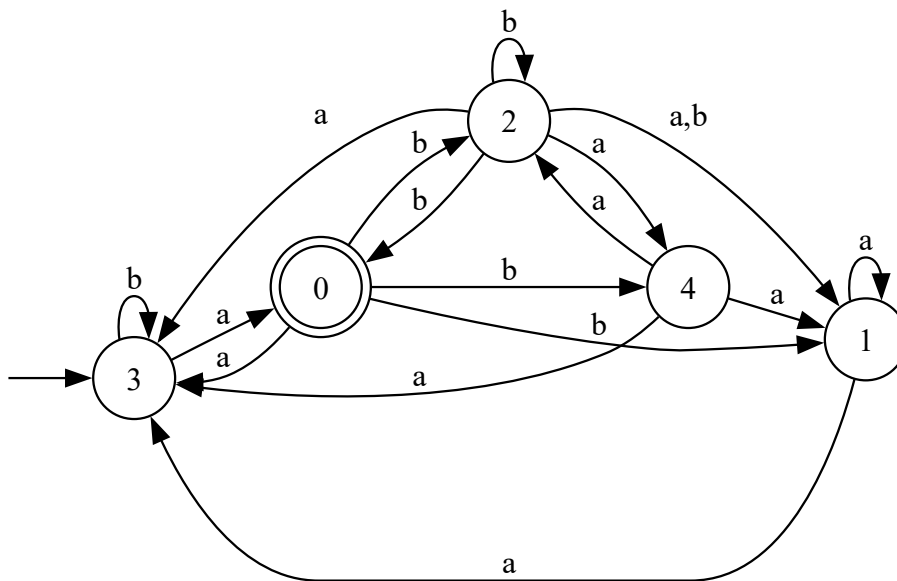
This NFA is legitimate.

8.14   NFA 14
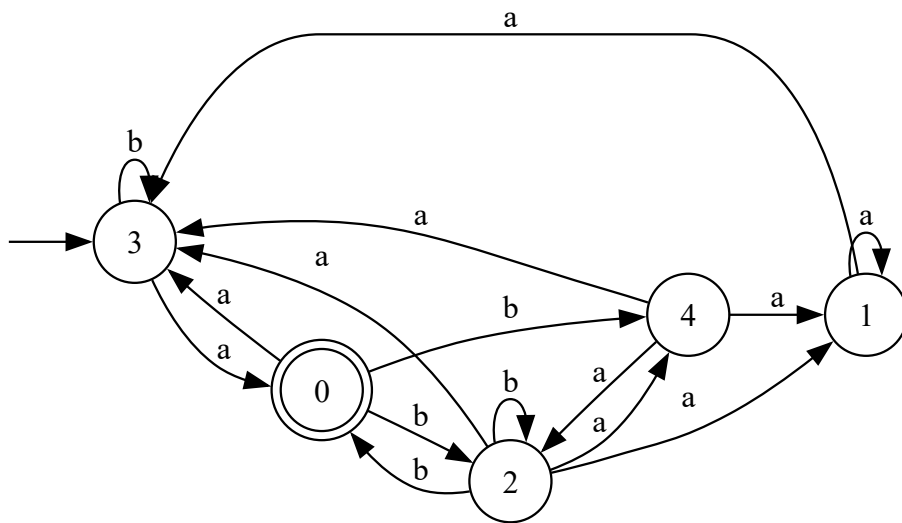
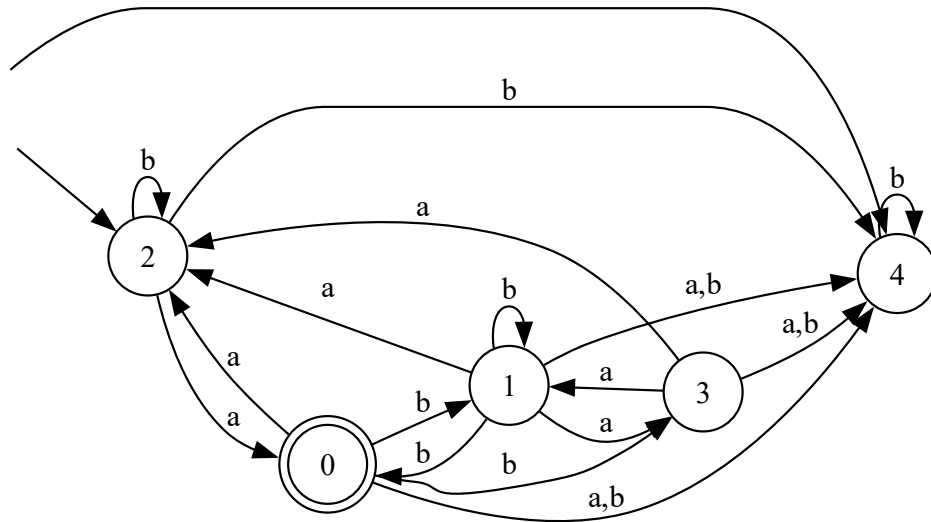This NFA is legitimate.

8.15   NFA 15
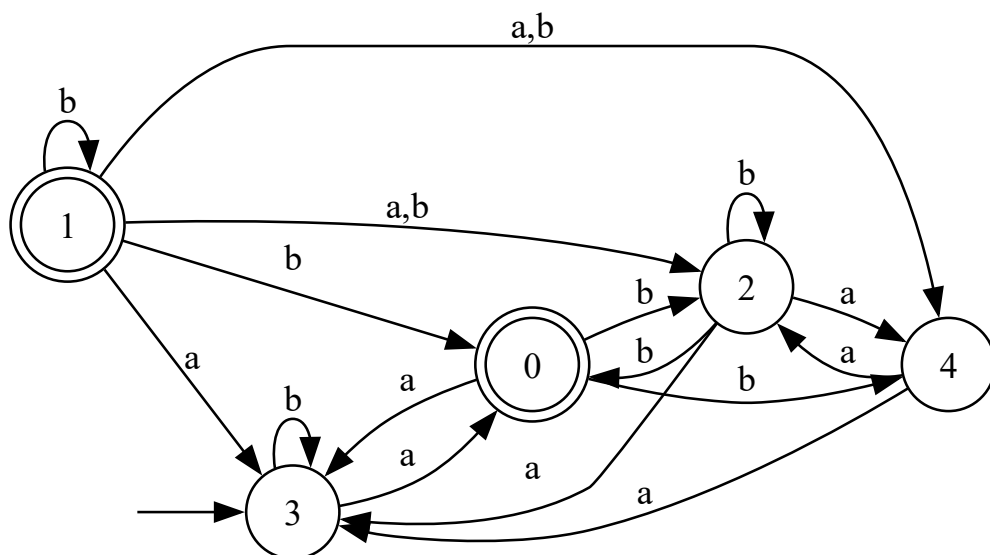
This NFA is legitimate.

8.16   NFA 16
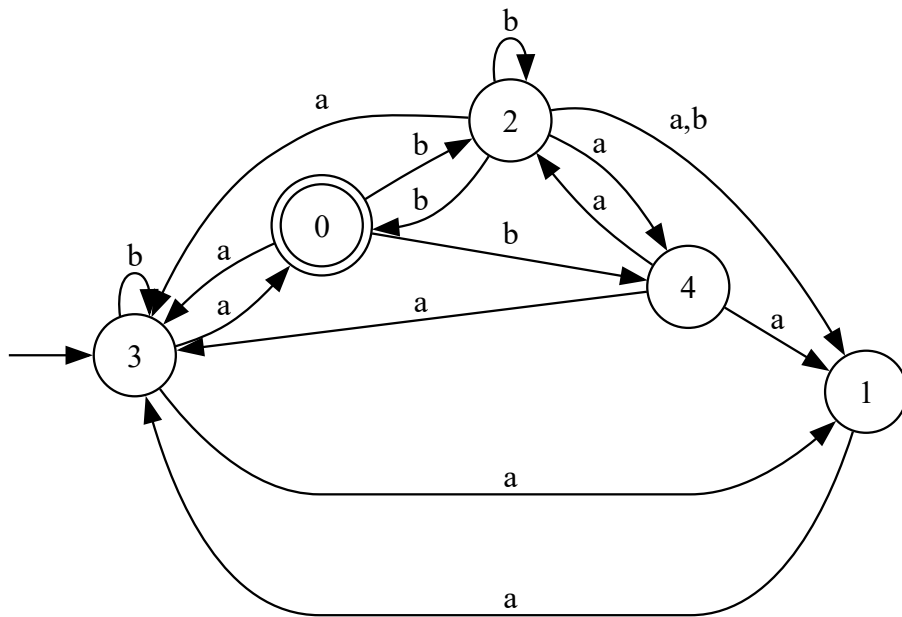
This NFA is legitimate.

8.17   NFA 17
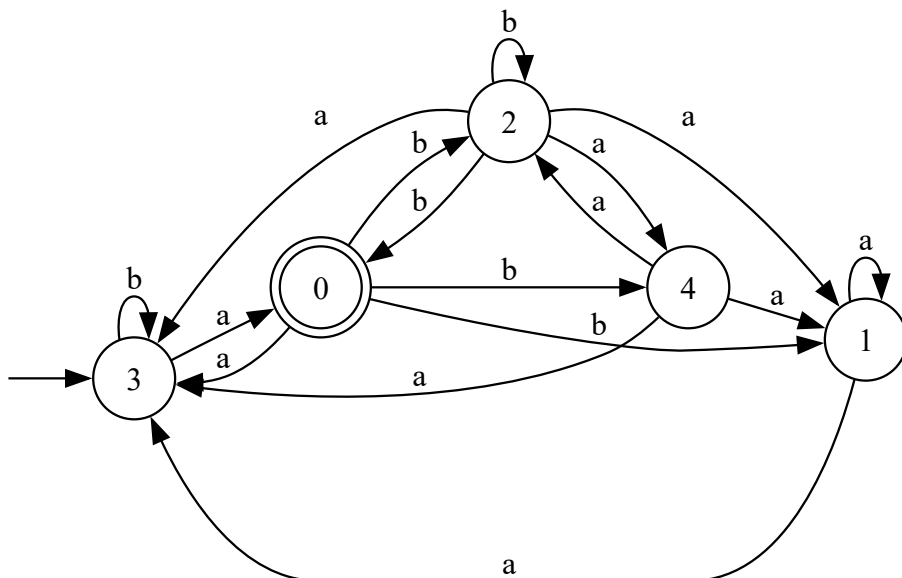
This NFA is legitimate.

8.18   NFA 18
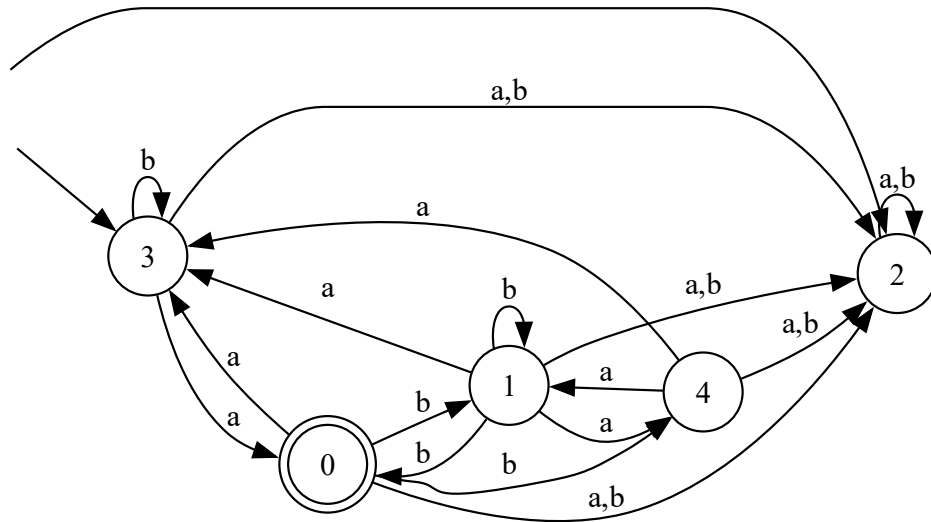
This NFA is legitimate.

8.19   NFA 19
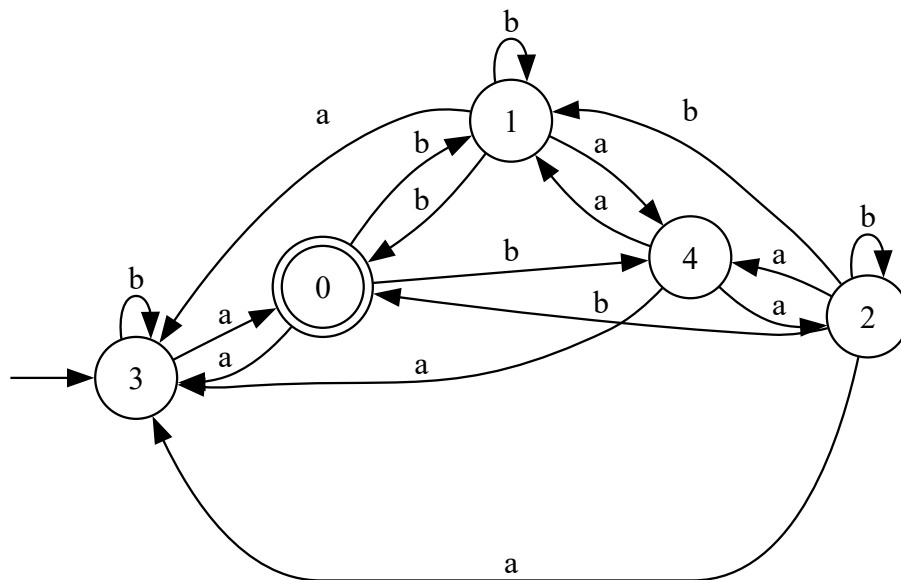
This NFA is legitimate.

8.20 NFA 20
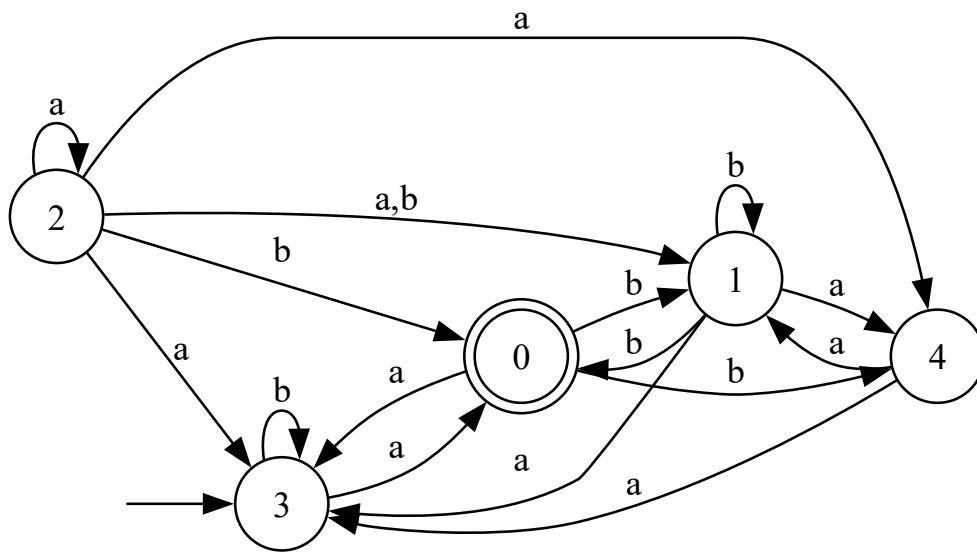
This NFA is legitimate.

8.21 NFA 21
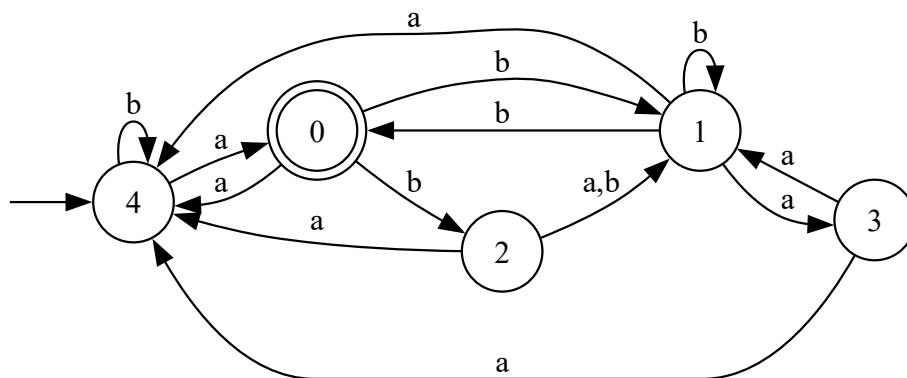
This NFA is legitimate.

8.22 NFA 22
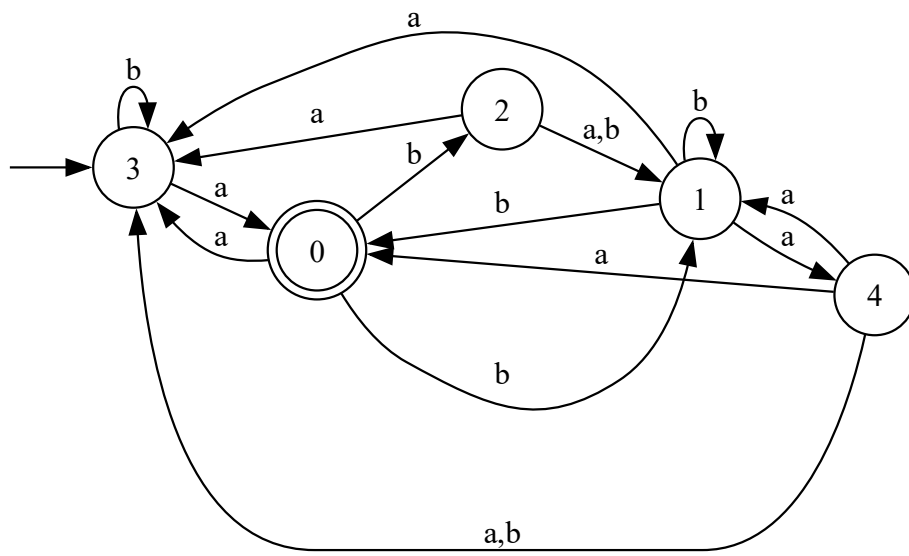
This NFA is legitimate.

8.23 NFA 23
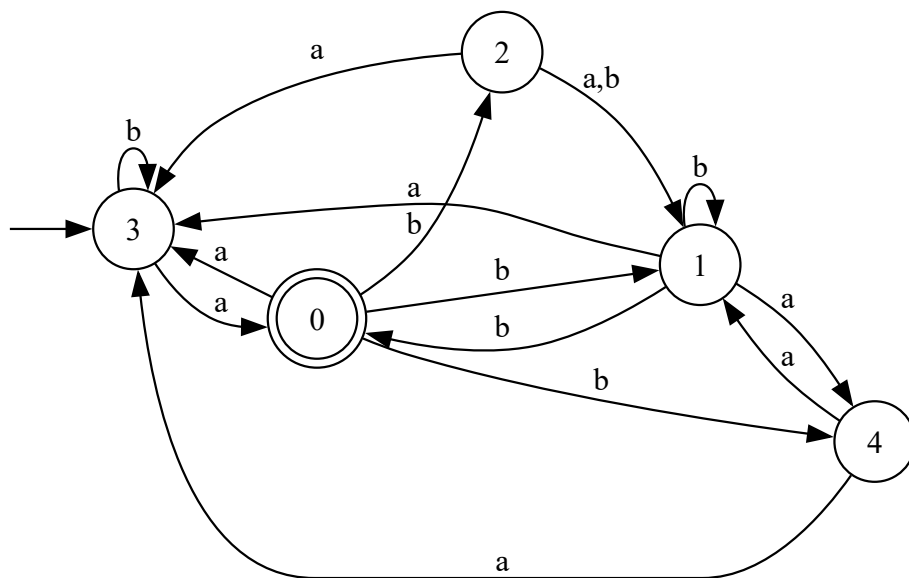
This NFA is legitimate.

8.24 NFA 24
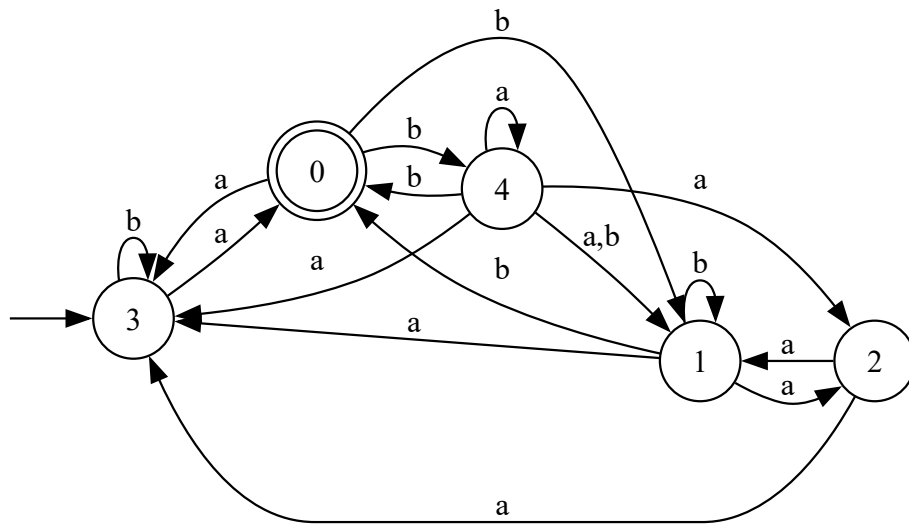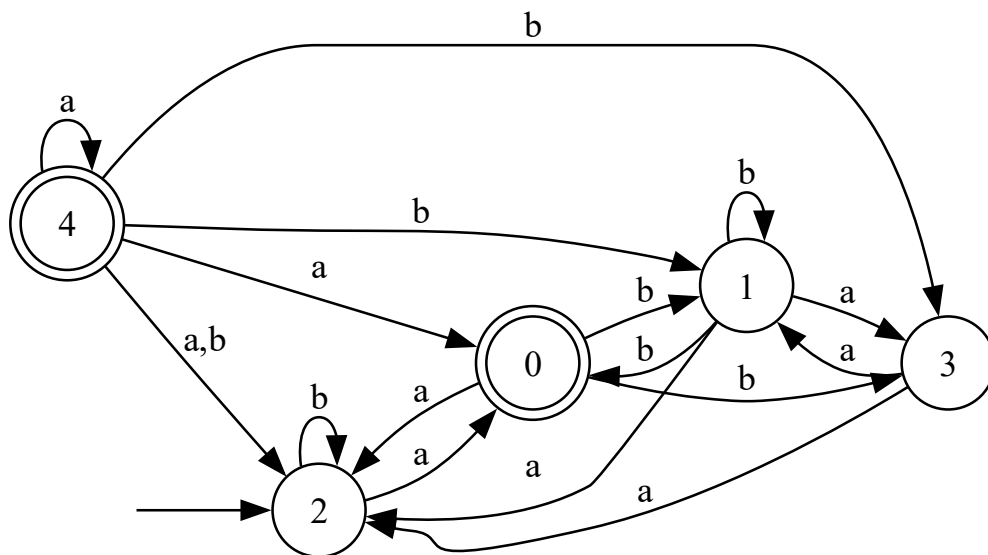

This NFA is legitimate.

8.25 NFA 25
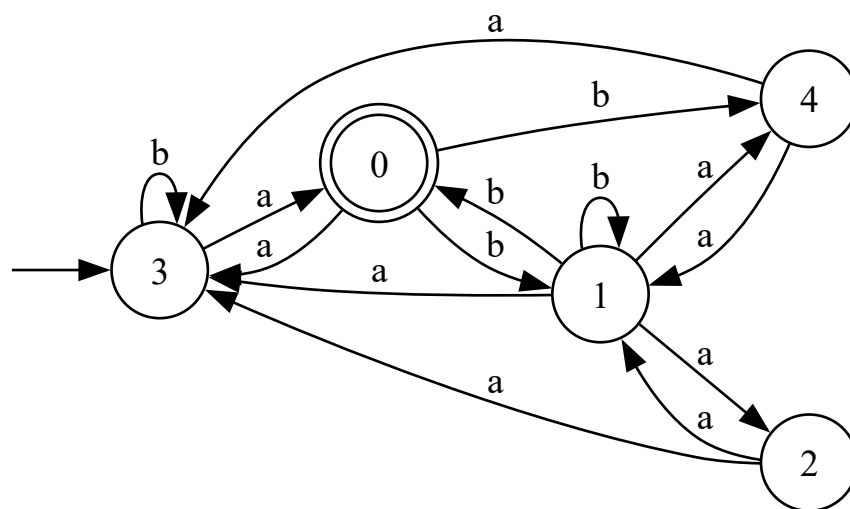
This NFA is legitimate.

8.26 NFA 26
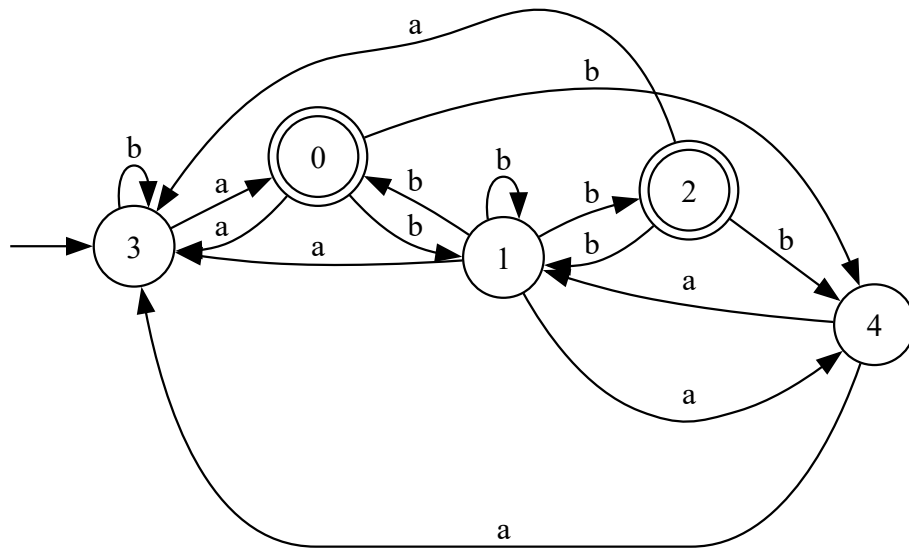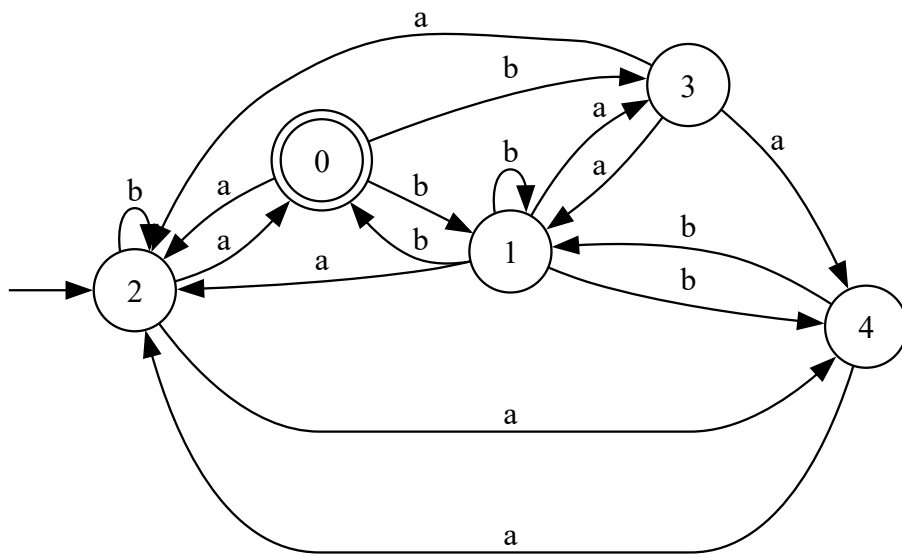

This NFA is legitimate.

8.27 NFA 27
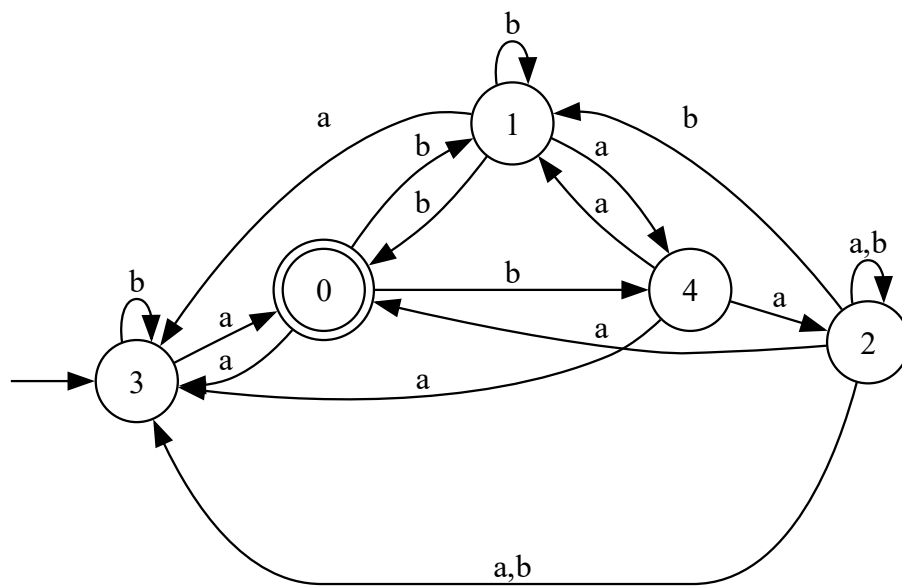
This NFA is legitimate.

8.28 NFA 28
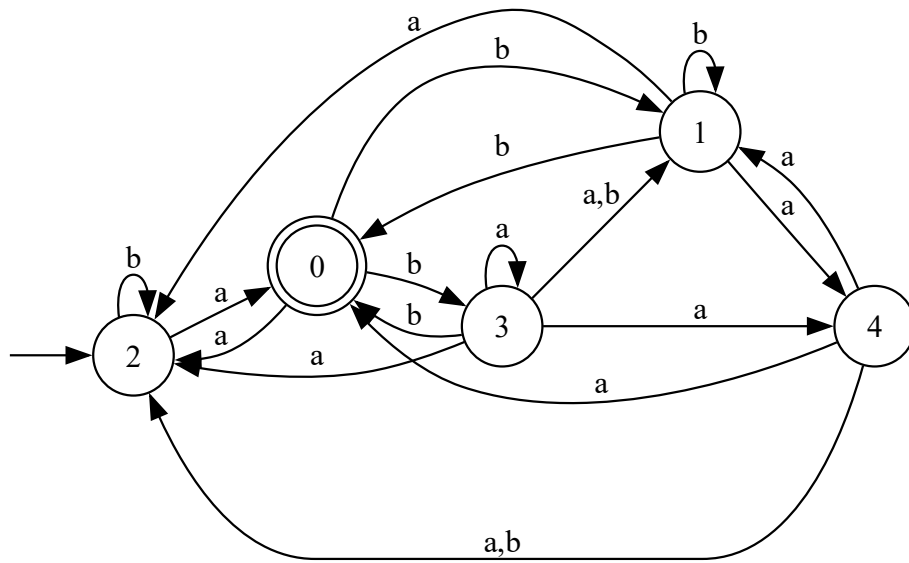
This NFA is legitimate.

8.29 NFA 29
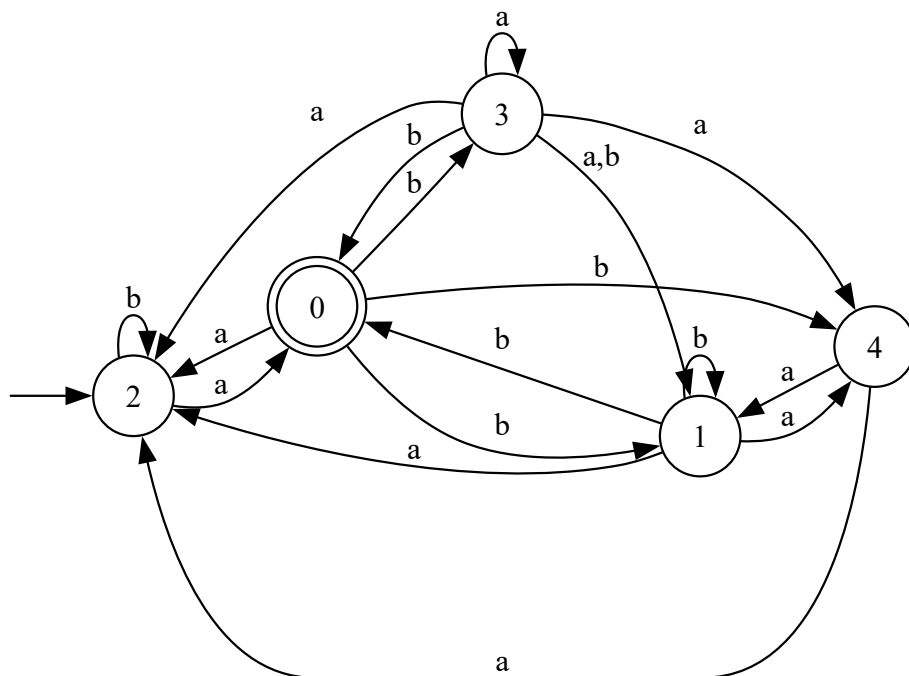
This NFA is legitimate.

8.30 NFA 30
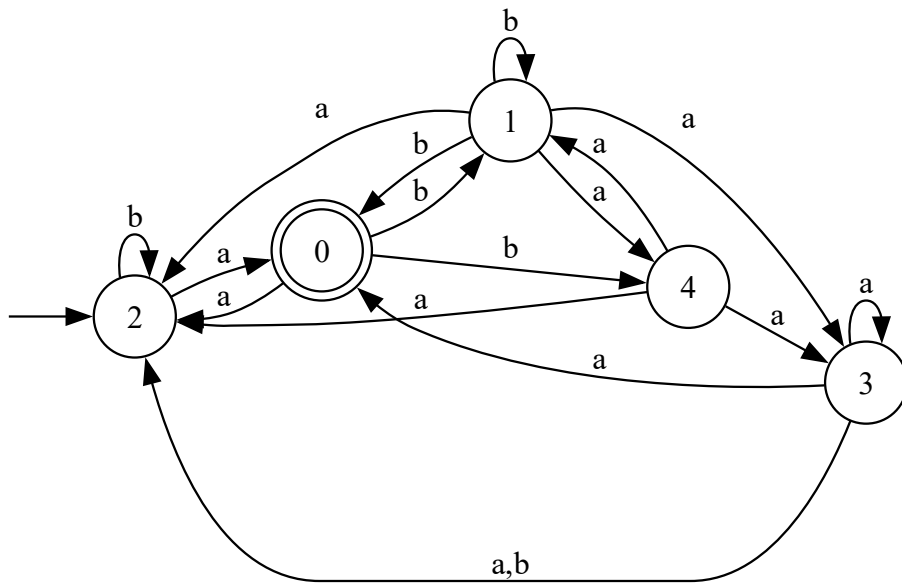
This NFA is legitimate.

8.31 NFA 31
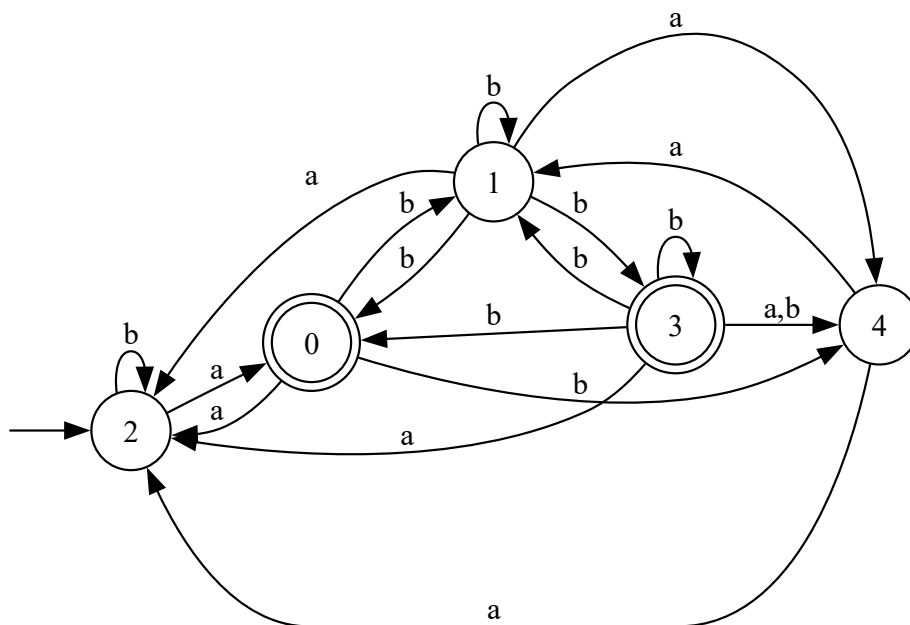
This NFA is legitimate.

8.32   NFA 32
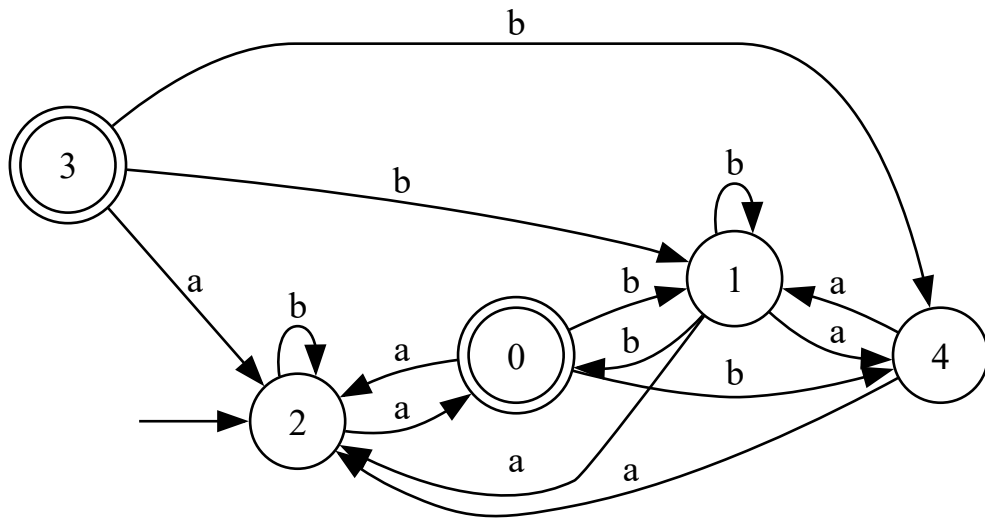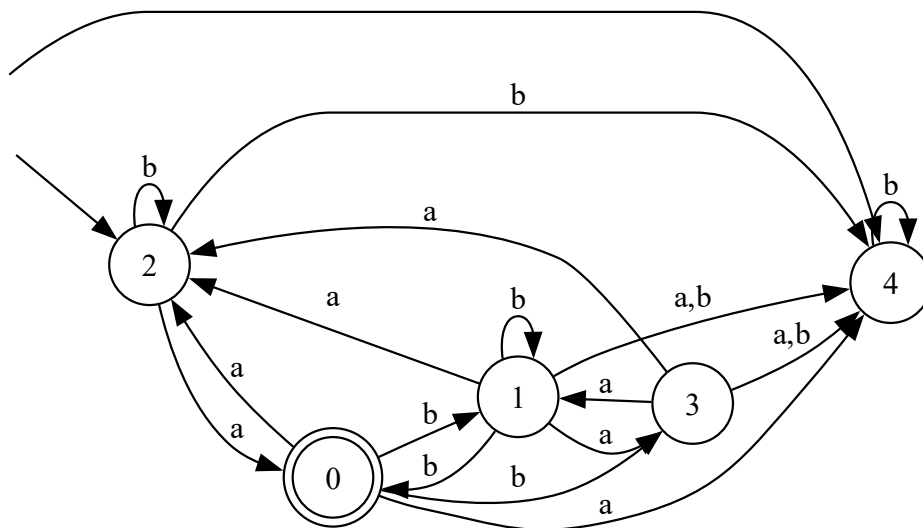

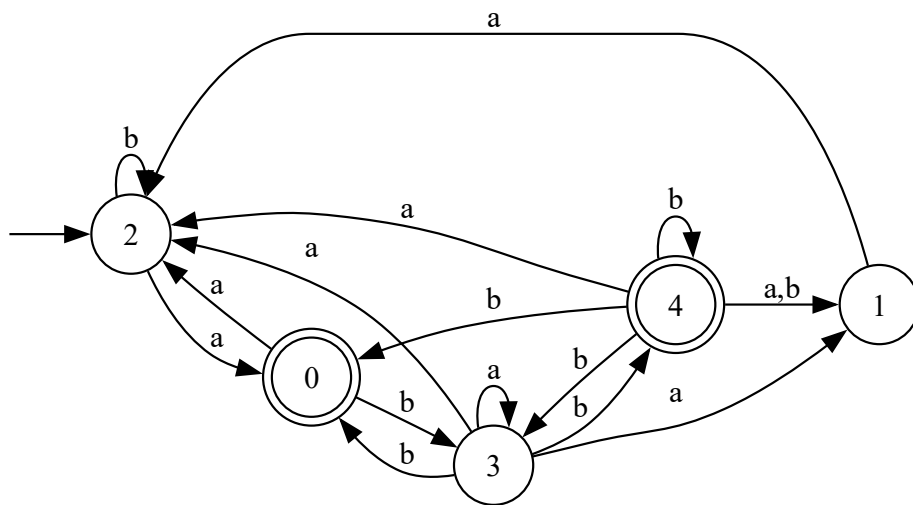This NFA is legitimate.

8.33   NFA 33
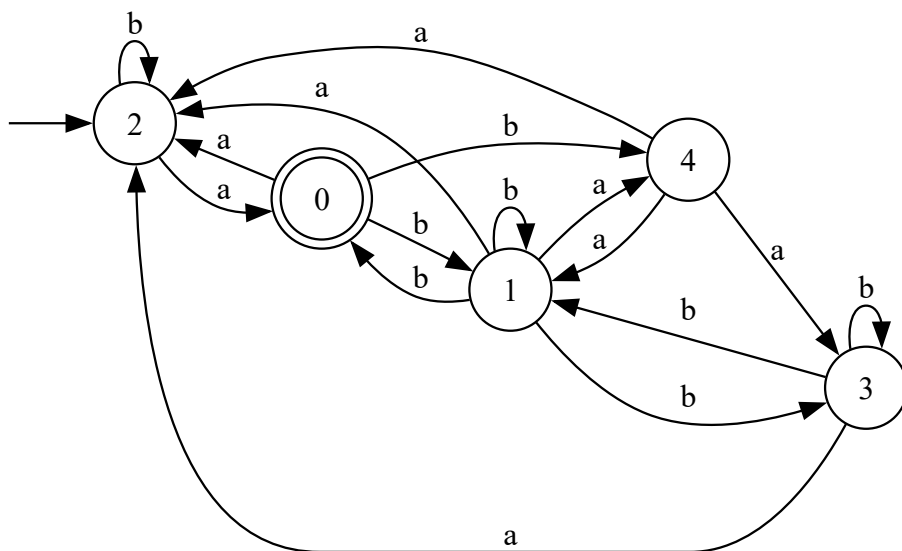
This NFA is legitimate.

8.34 NFA 34

This NFA is legitimate.

8.35 NFA 35

This NFA is legitimate.

8.36 NFA 36

This NFA is legitimate.

8.37 NFA 37

This NFA is legitimate.

8.38   NFA 38

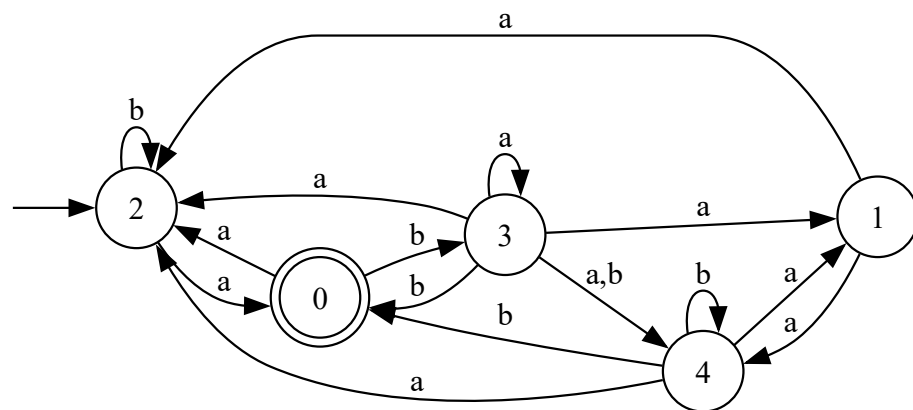This NFA is legitimate.

8.39   NFA 39

This NFA is legitimate.
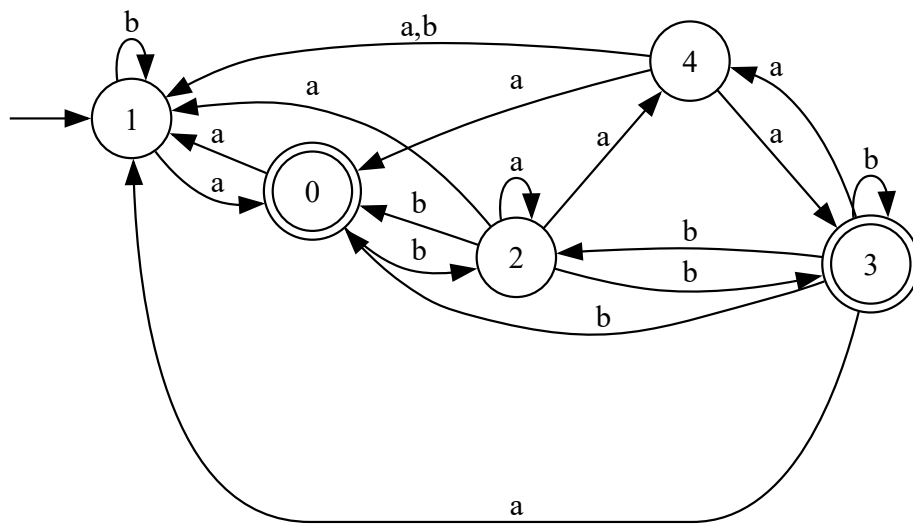
8.40   NFA 40

This NFA is legitimate.

8.41   NFA 41

This NFA is legitimate.

8.42   NFA 42

This NFA is legitimate.

8.43   NFA 43

This NFA is legitimate.

8.44   NFA 44

This NFA is legitimate.

8.45   NFA 45

This NFA is legitimate.

8.46 NFA 46

This NFA is legitimate.

8.47 NFA 47

This NFA is legitimate.

8.48   NFA 48

This NFA is legitimate.

8.49   NFA 49

This NFA is legitimate.

8.50   NFA 50

This NFA is not legitimate.

8.51   NFA 51
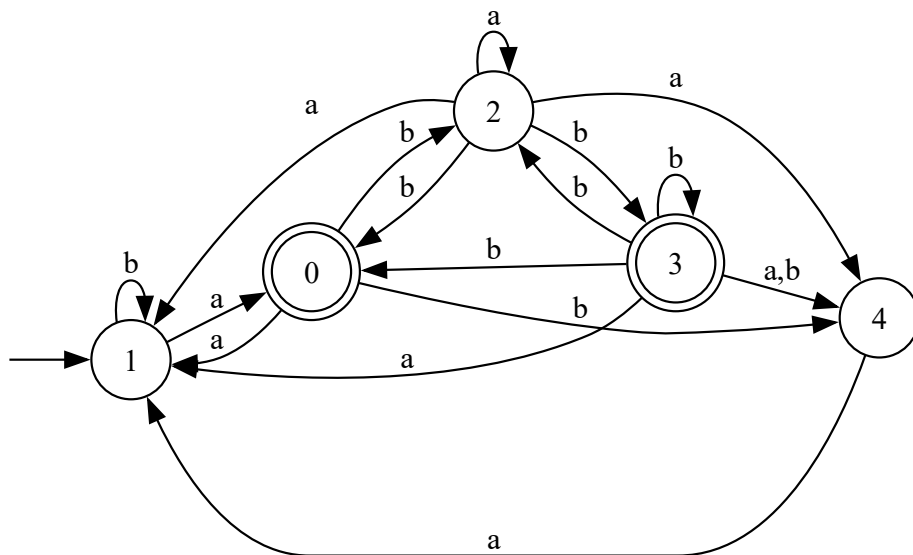

This NFA is legitimate.
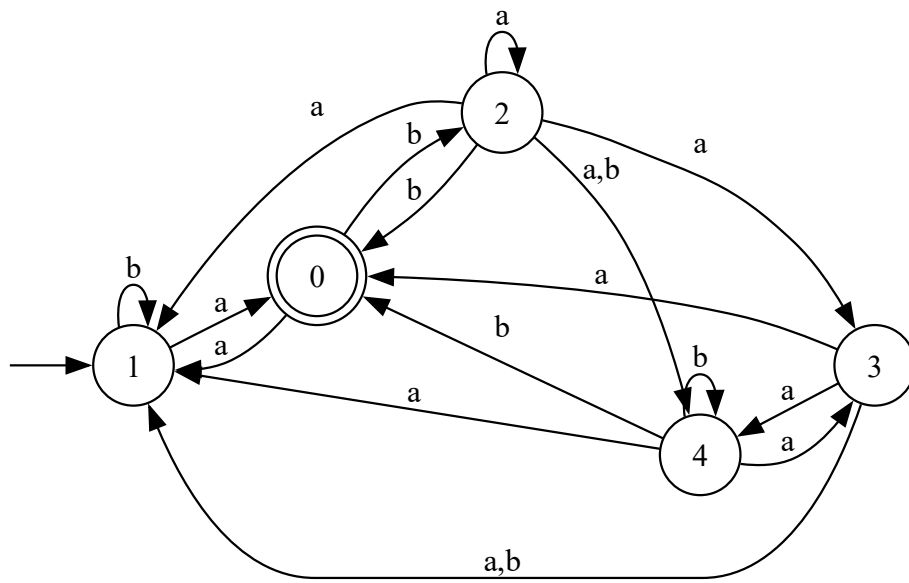
8.52   NFA 52

This NFA is legitimate.

8.53   NFA 53

This NFA is not legitimate.

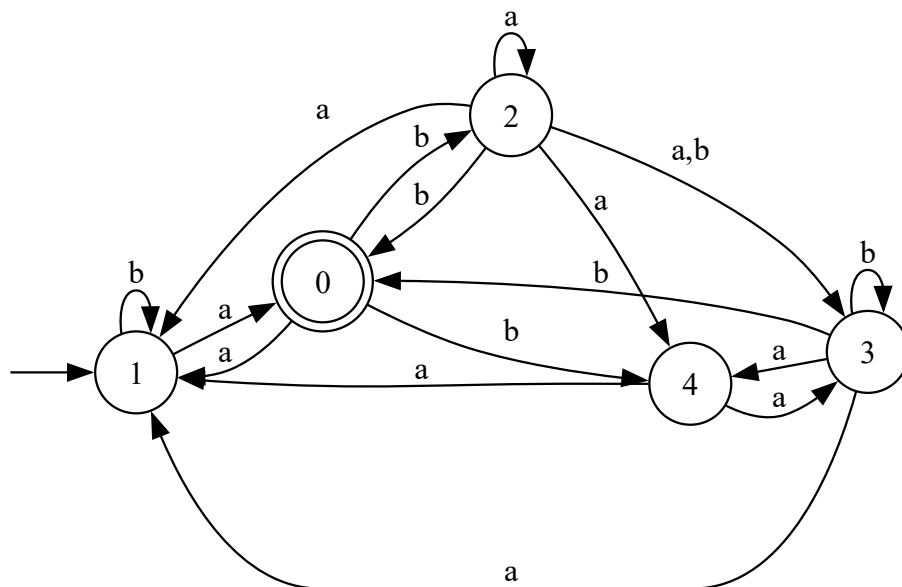## 8.54   NFA 54

This NFA is legitimate.

8.55   NFA 55

This NFA is legitimate.