Introduction to Theoretical Computer Science

Exercise tasks

Preparation for mid-term exam – part 1

Faculty of Electrical Engineering and Computing
University of Zagreb

Task 1

- Language L over the alphabet {0,1,2} contains all sequences in which there is no consecutive repetition of the symbol '1'. Construct finate-state automata which accepts language L.

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(DFA, NFA, ε-NFA)

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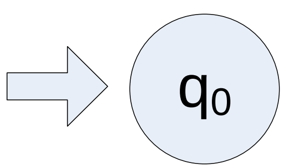

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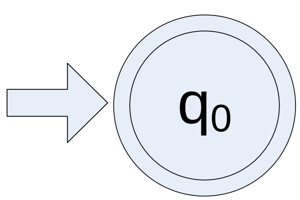

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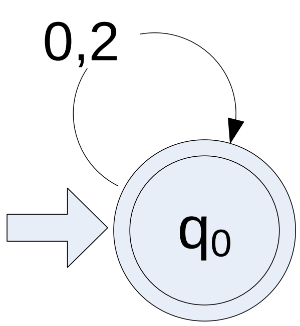

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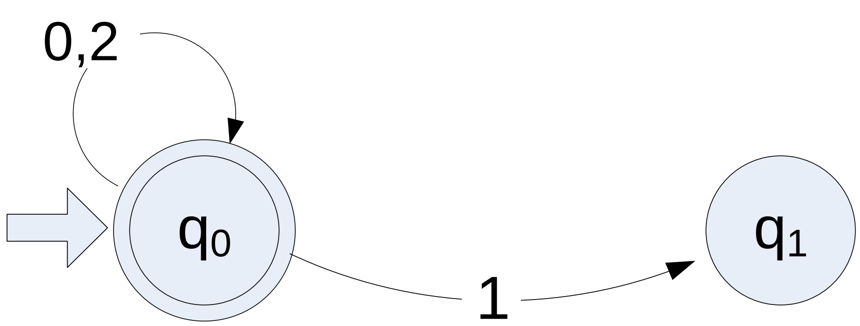

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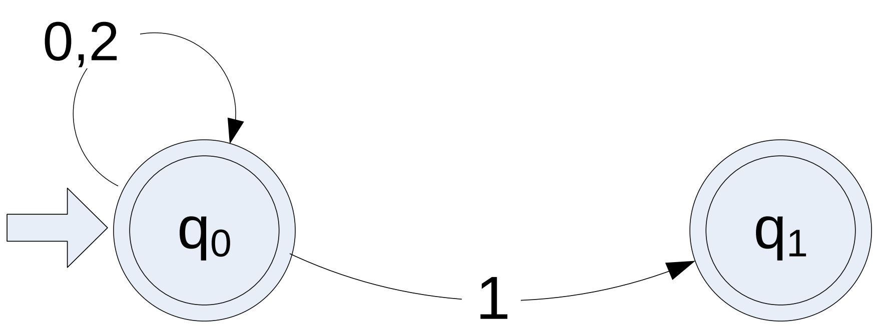

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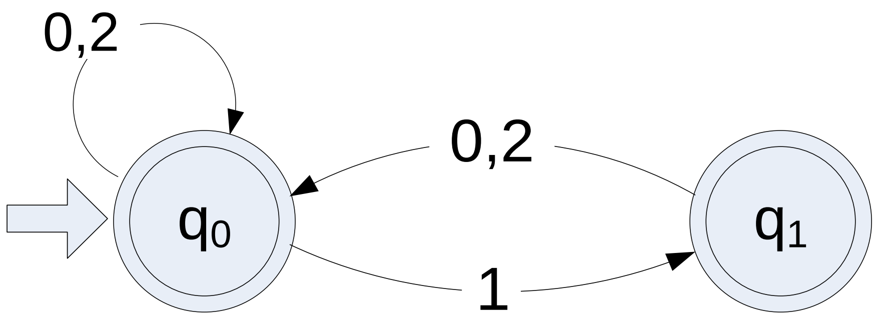

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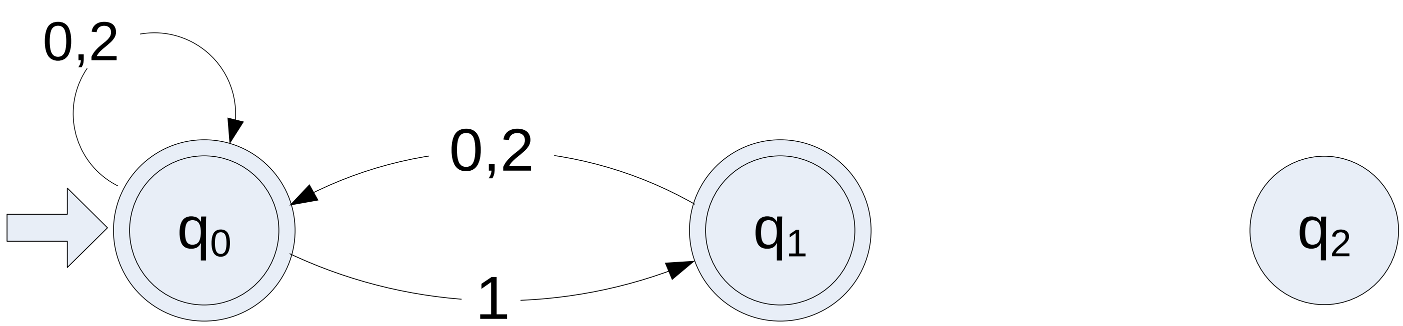

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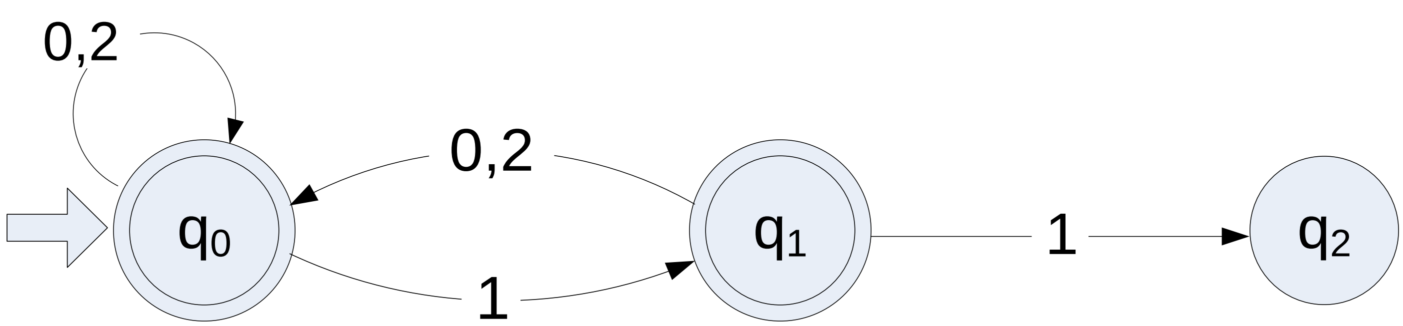

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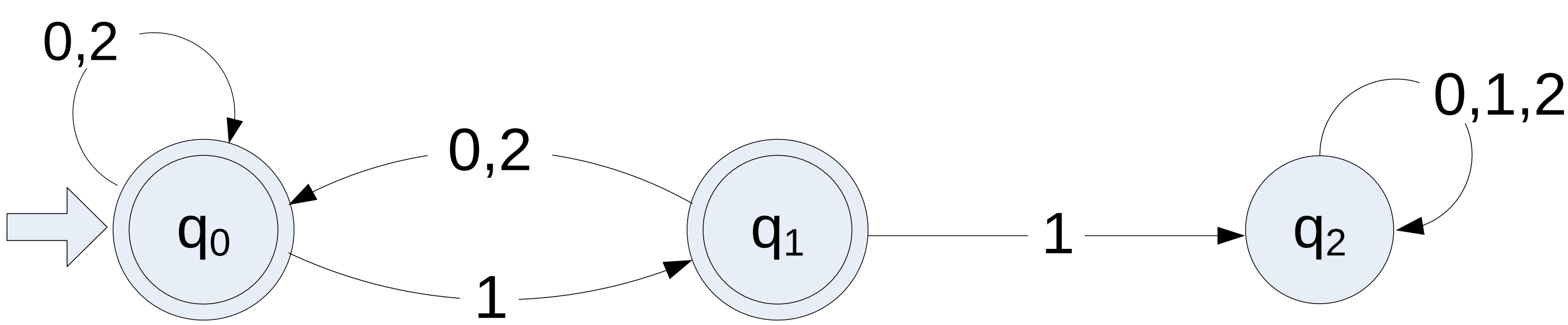

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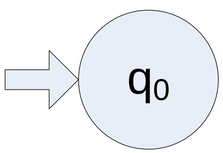

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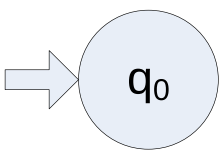

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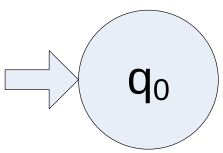

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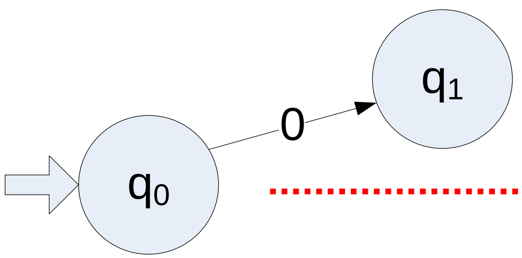

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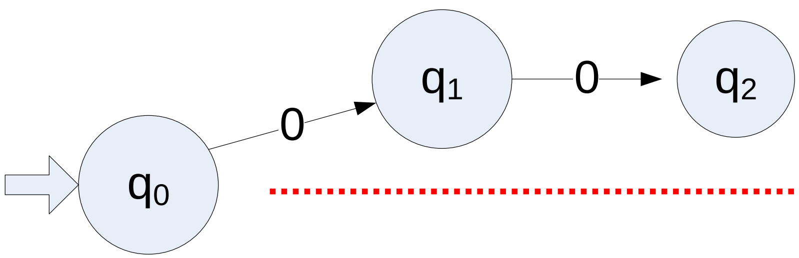

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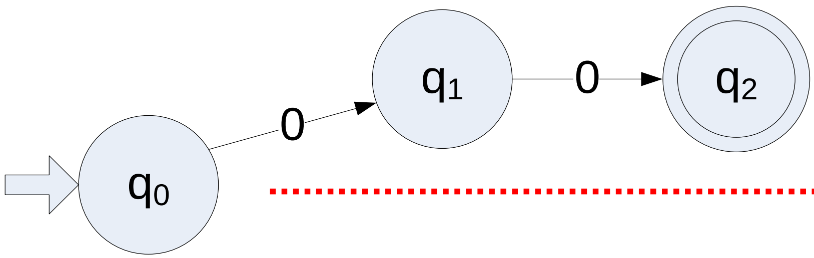

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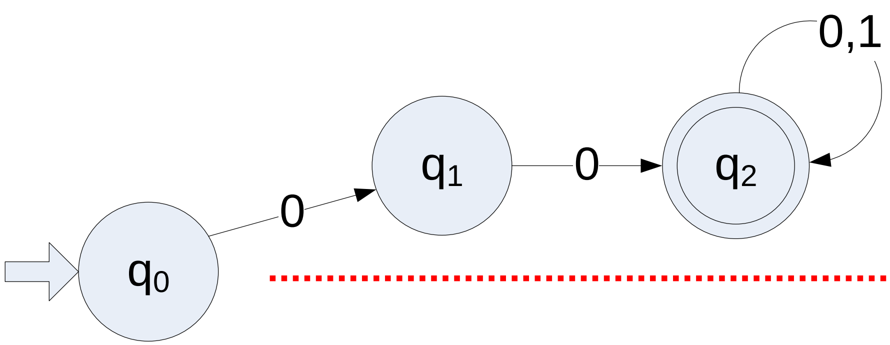

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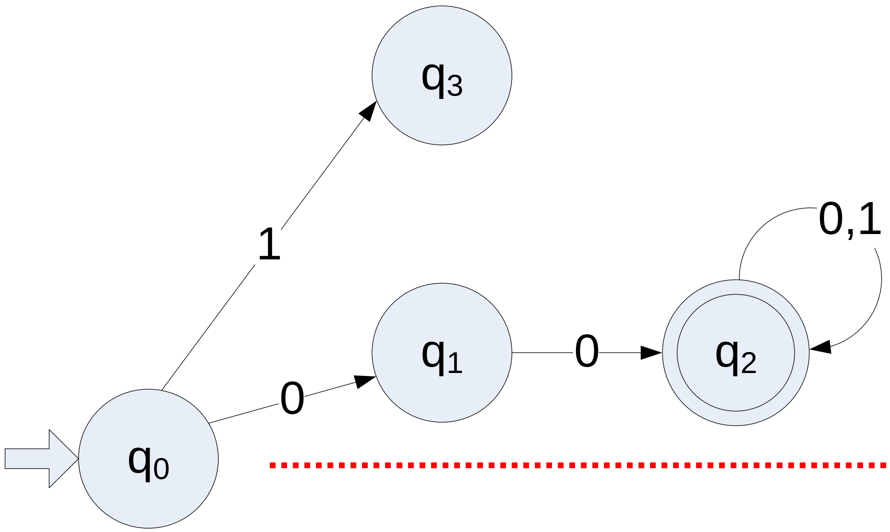

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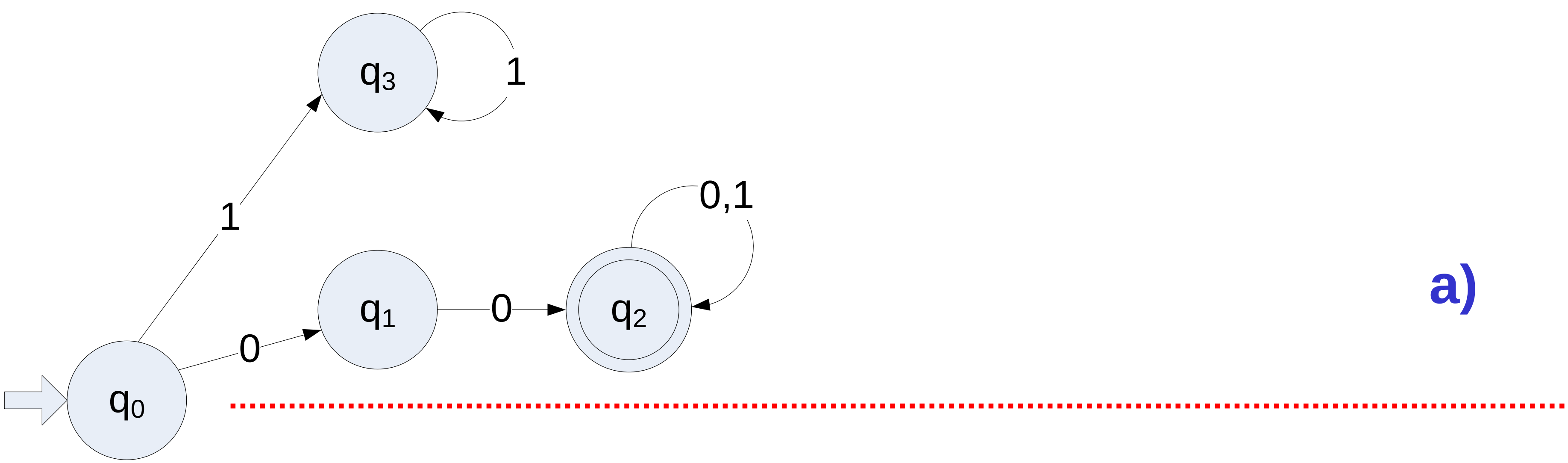

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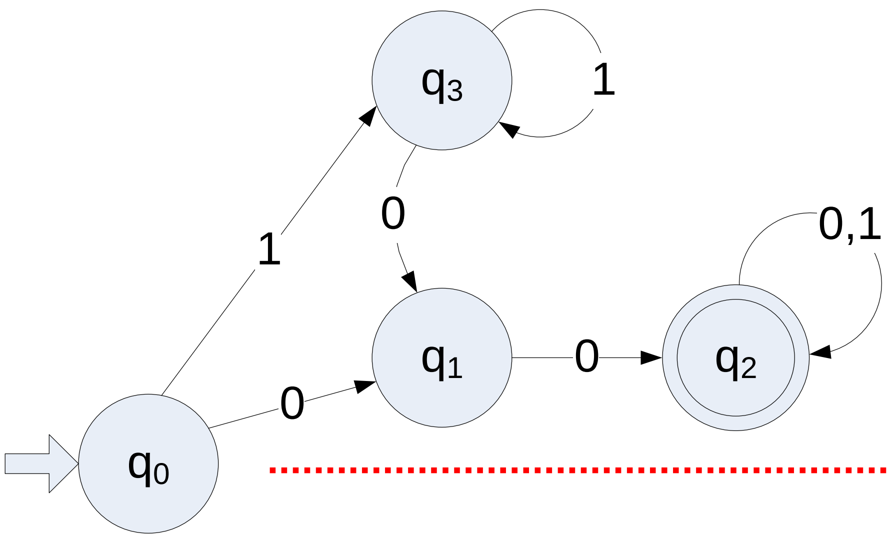

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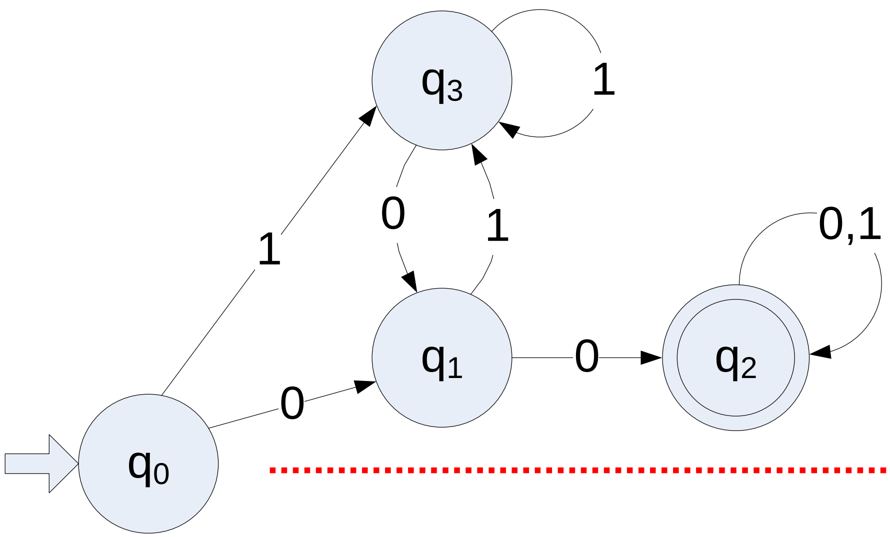

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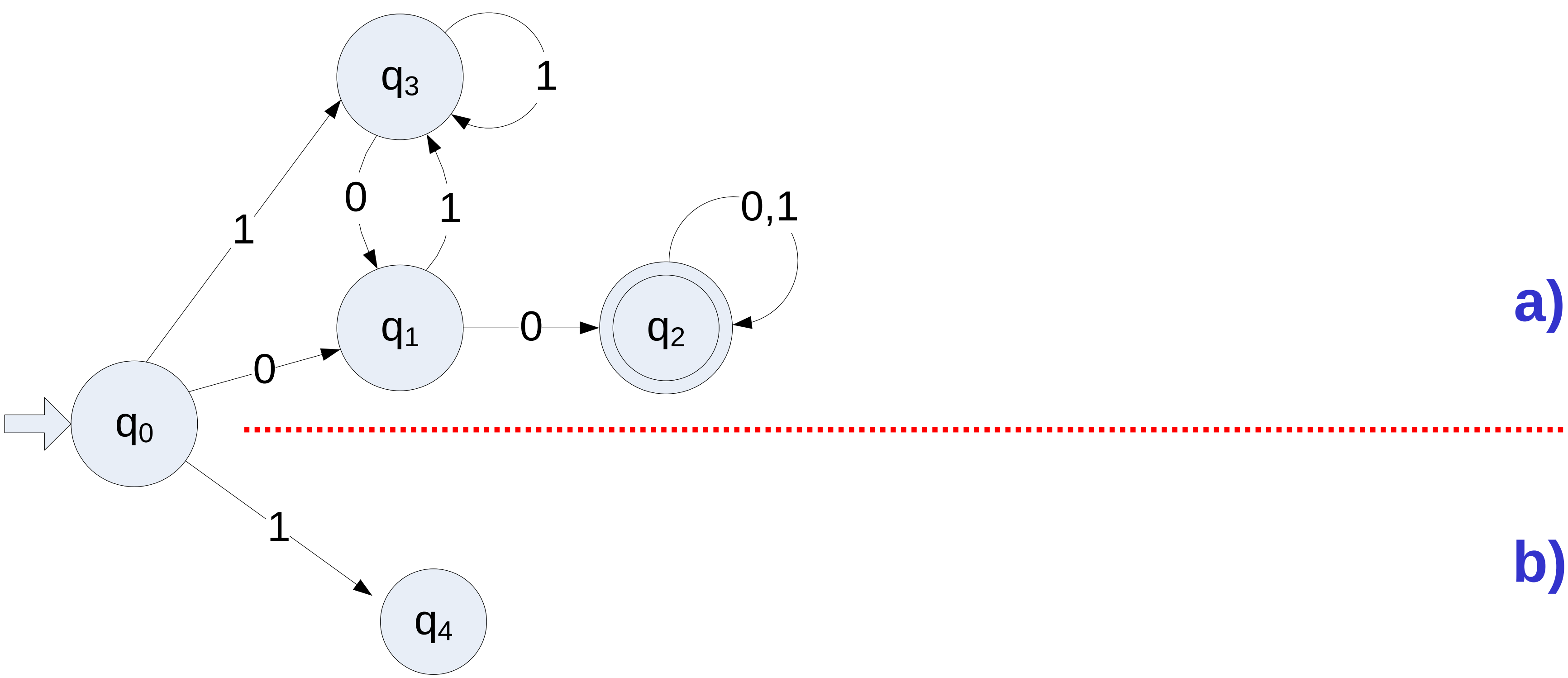

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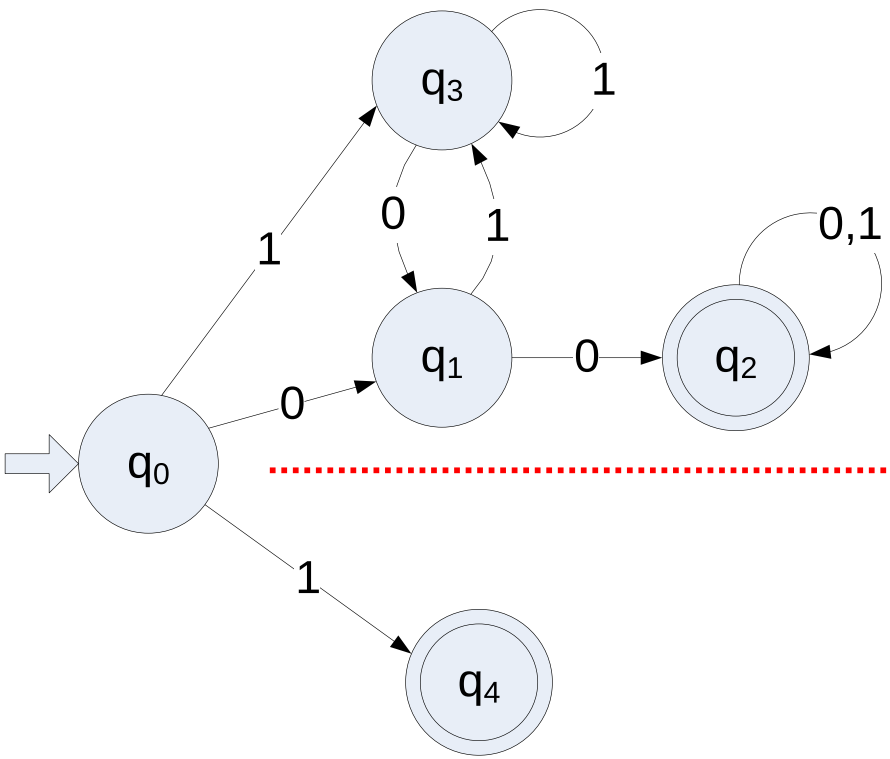

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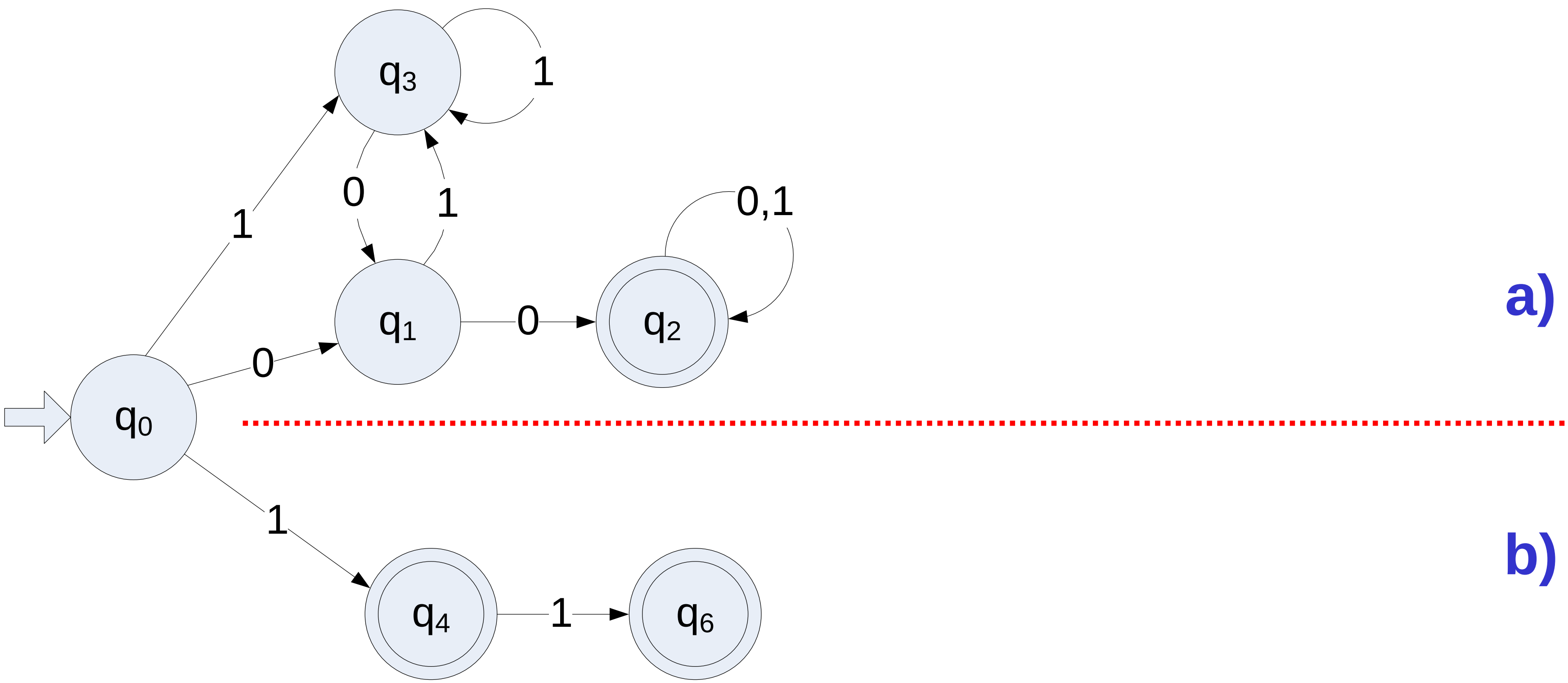

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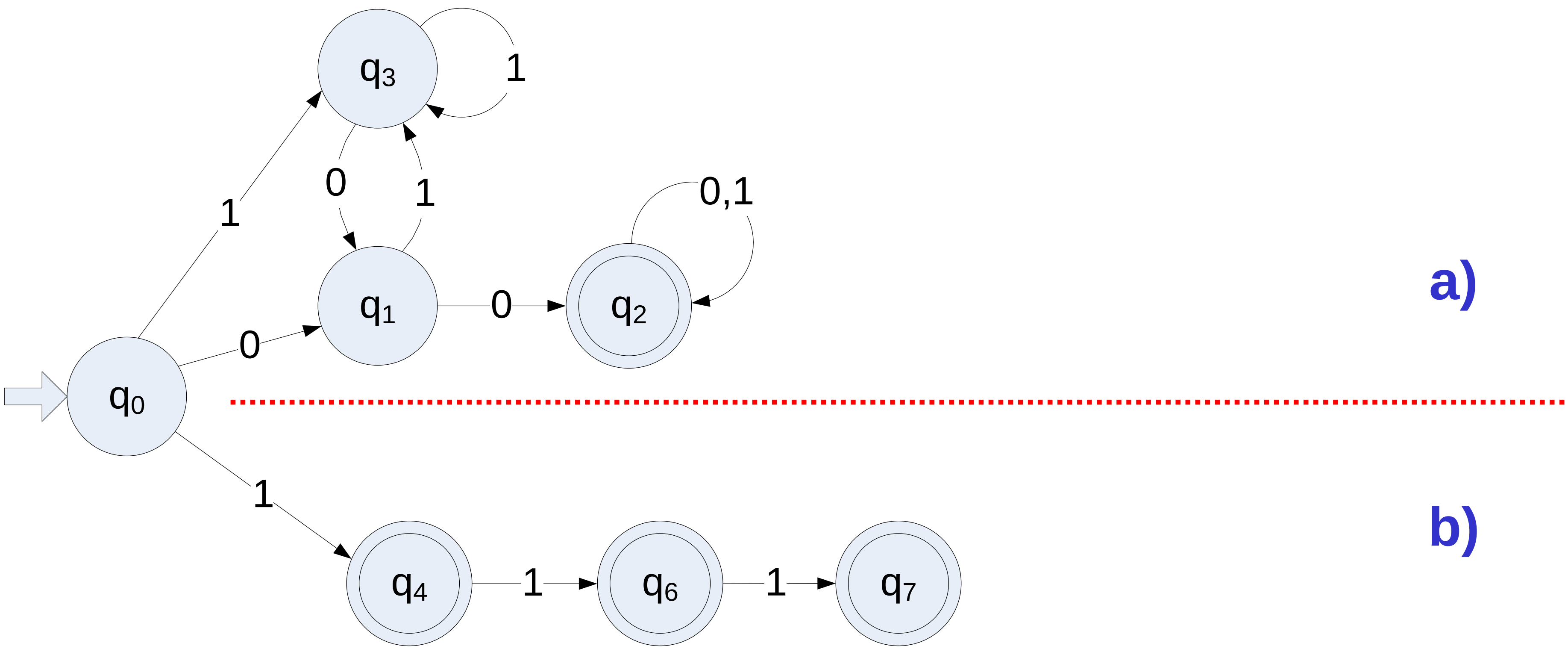

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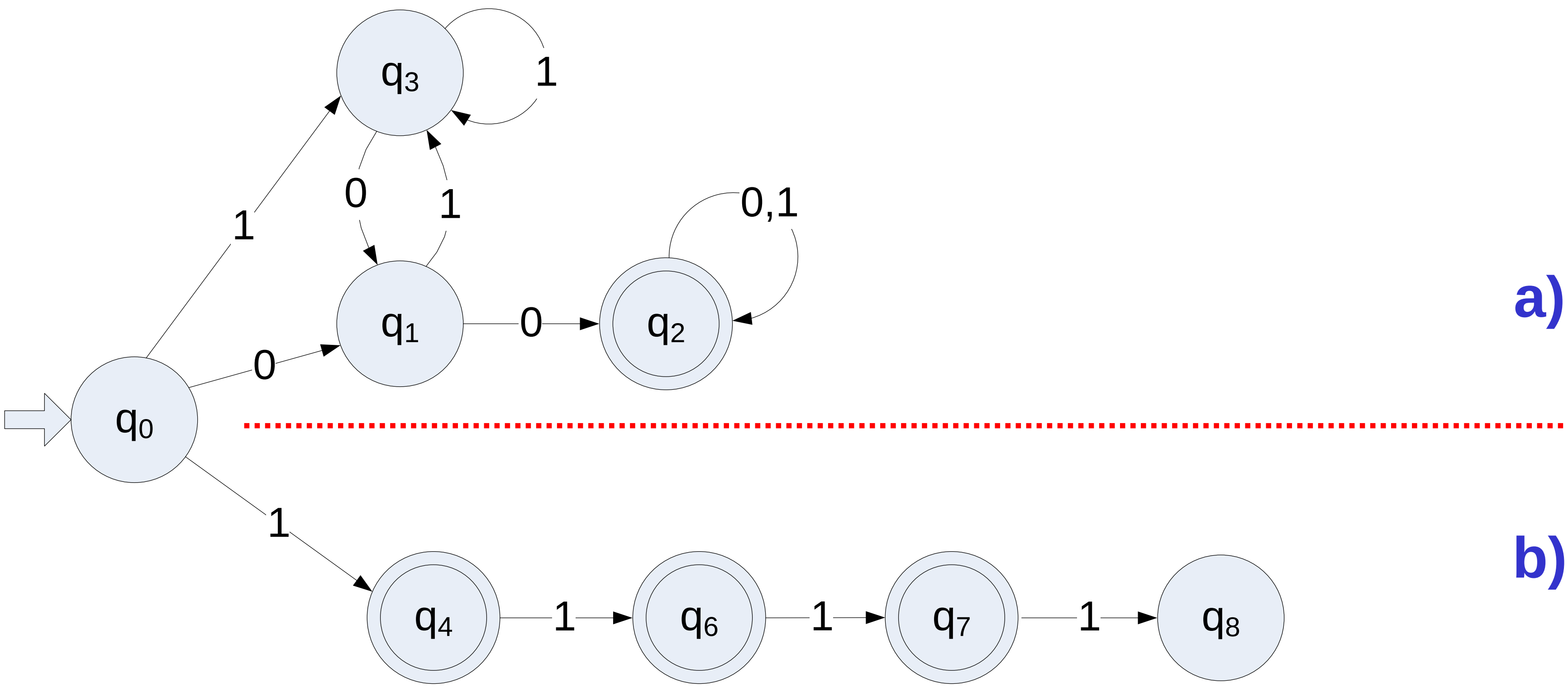

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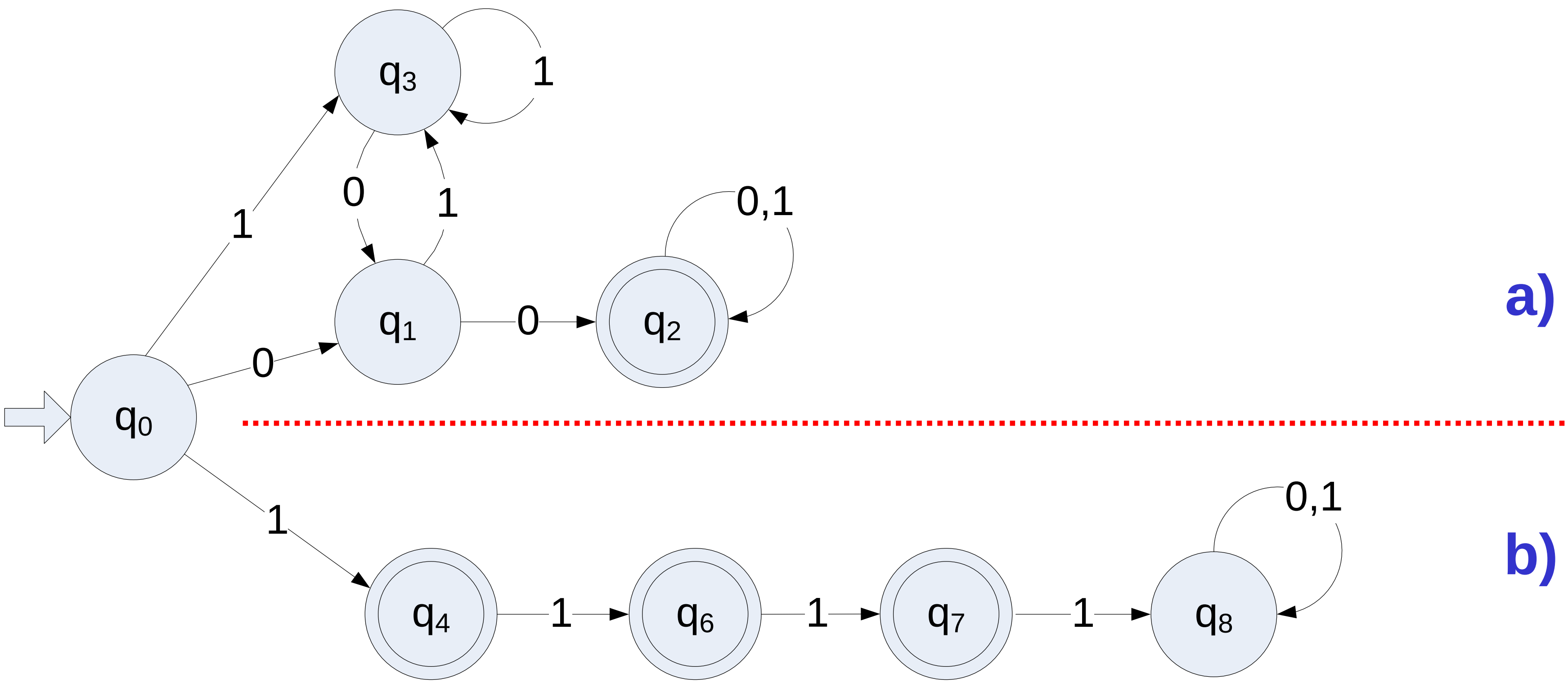

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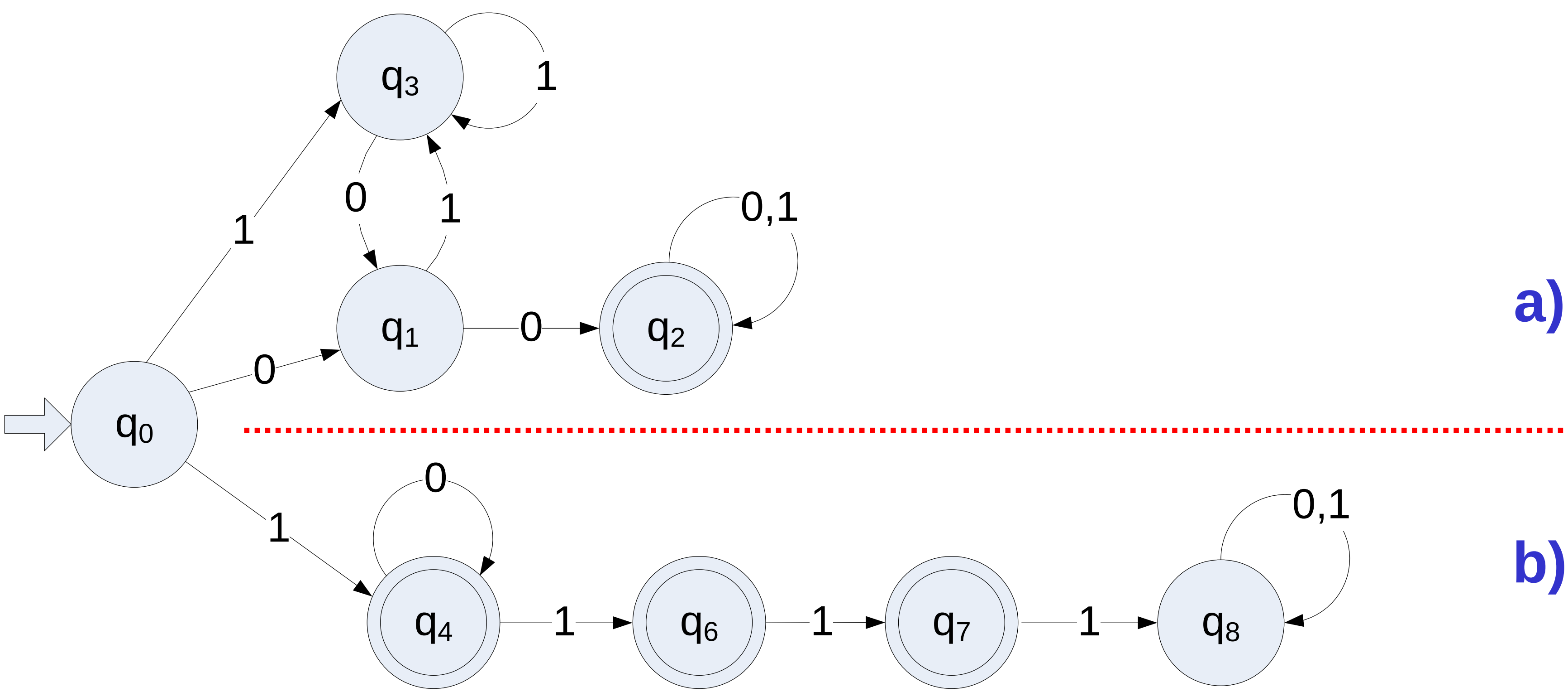

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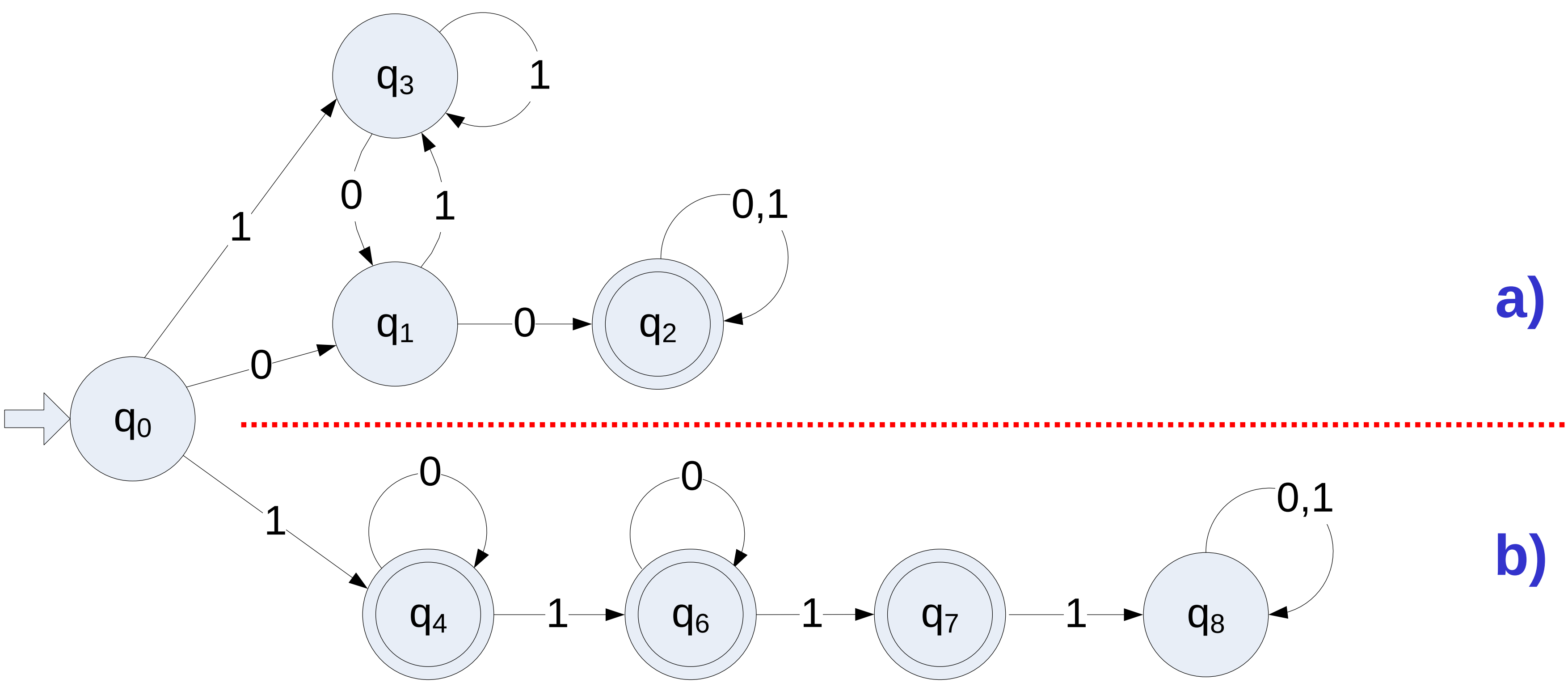

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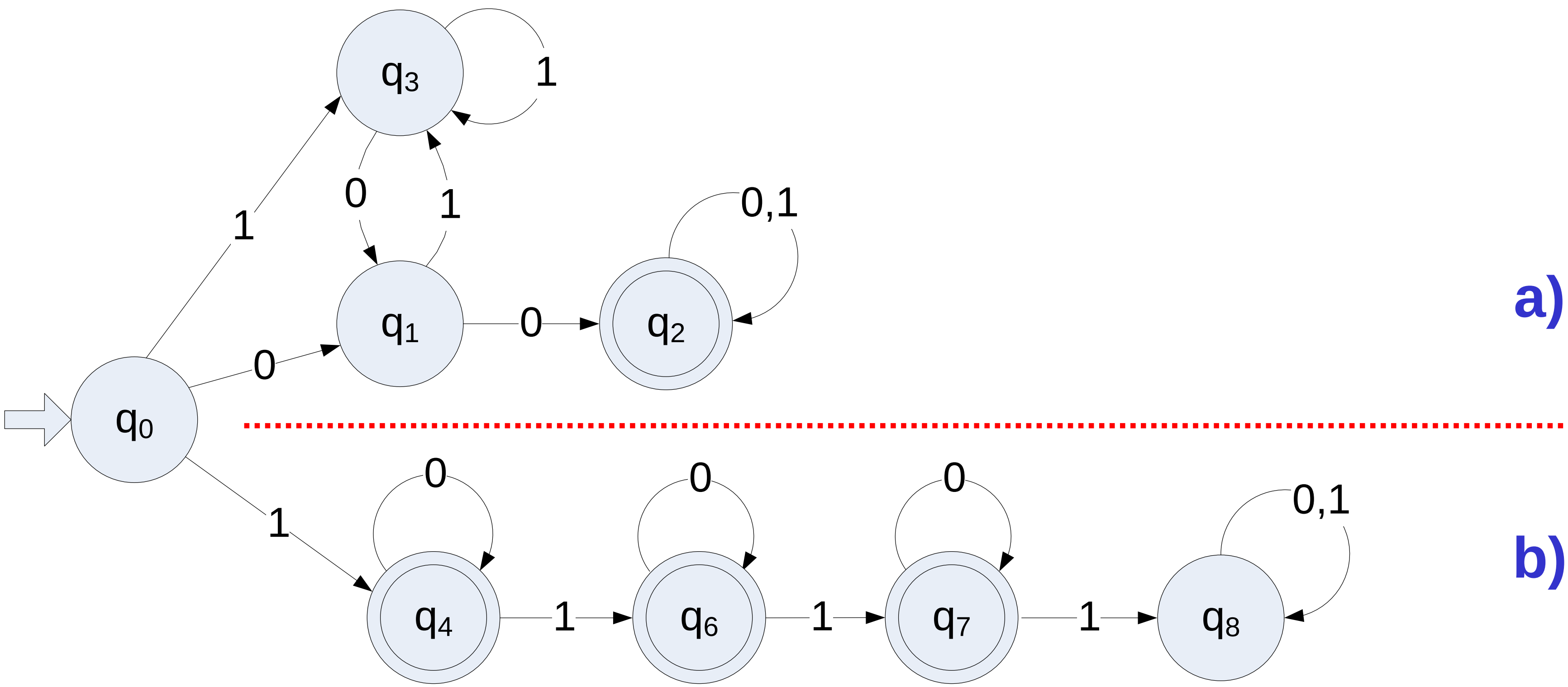

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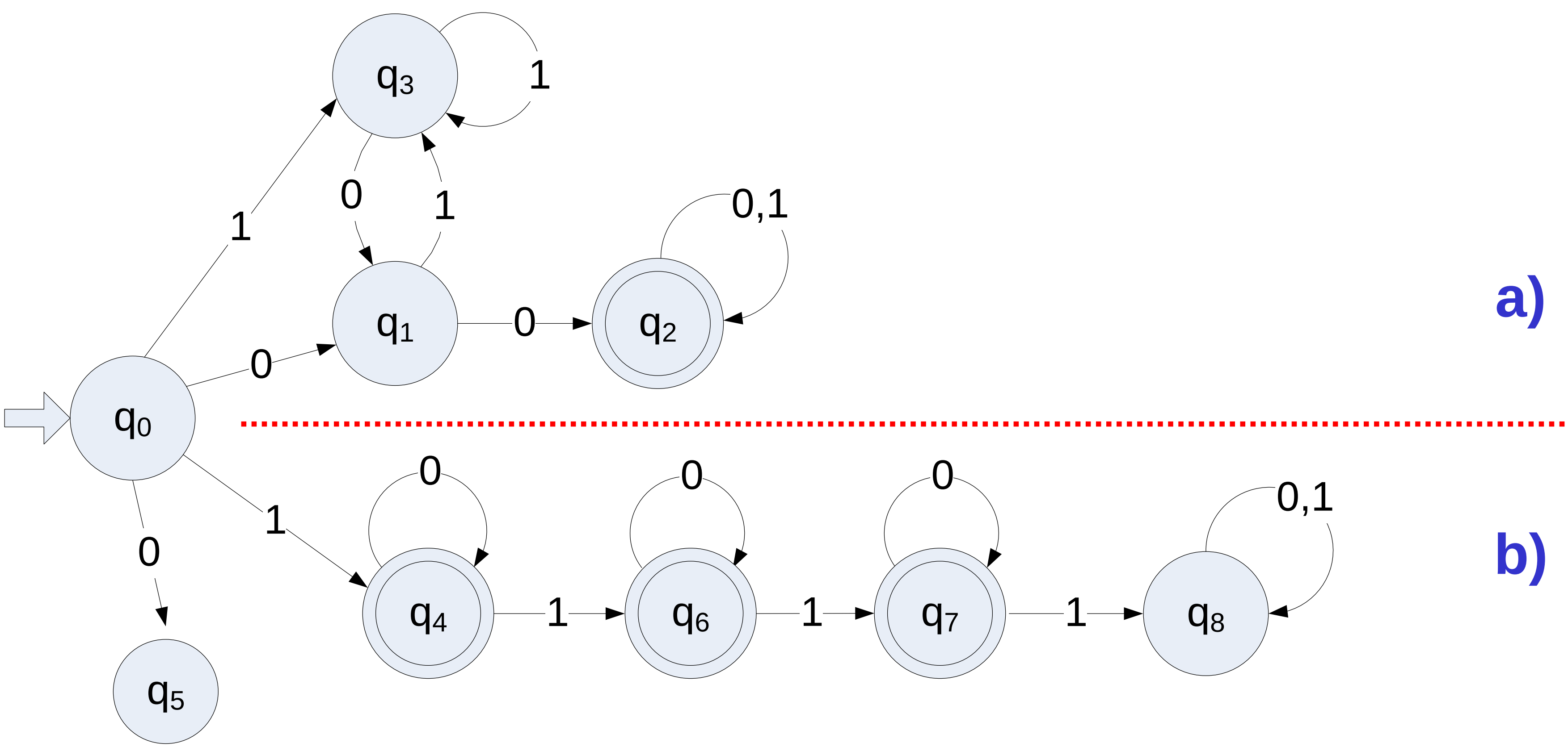

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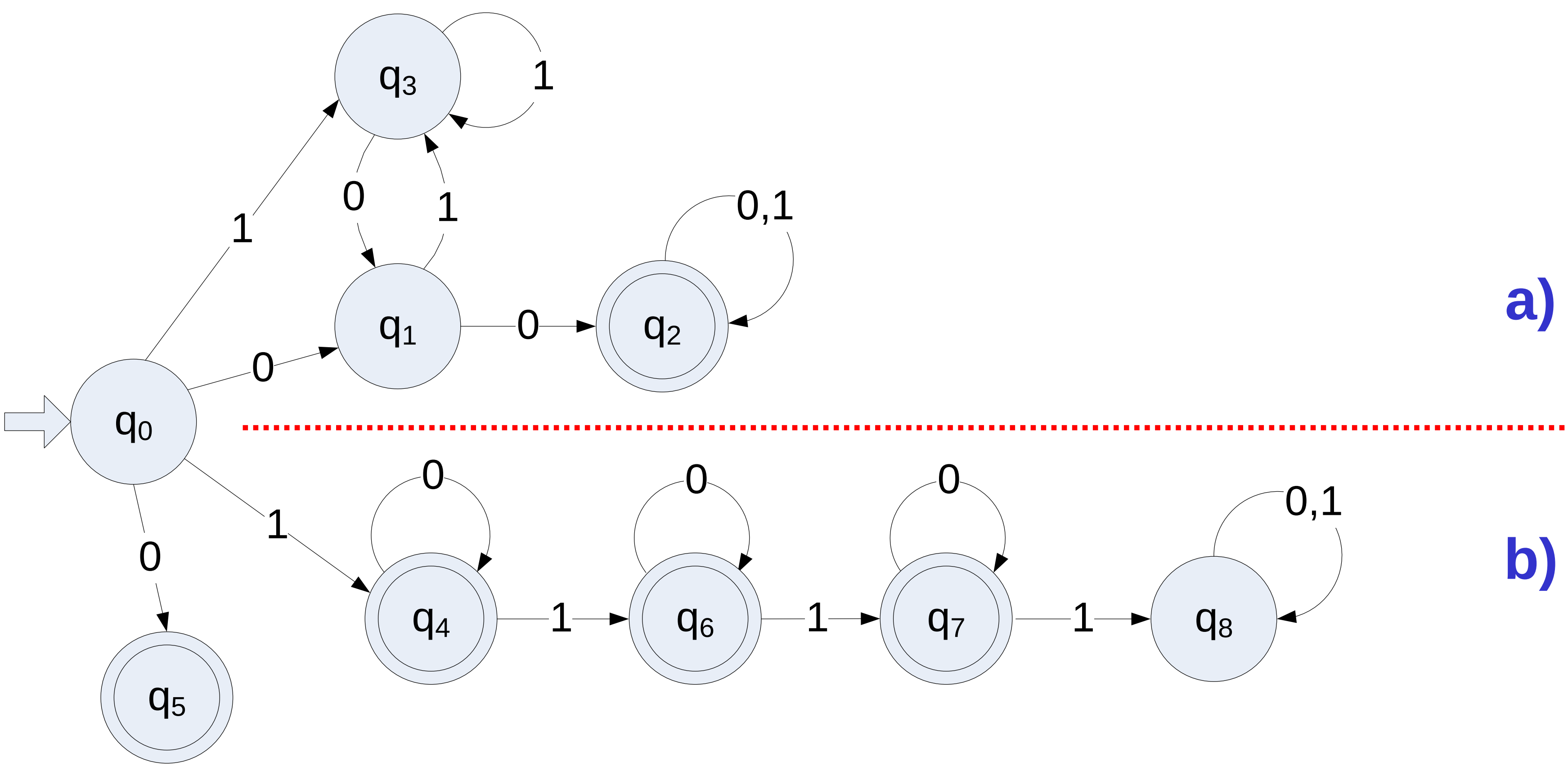

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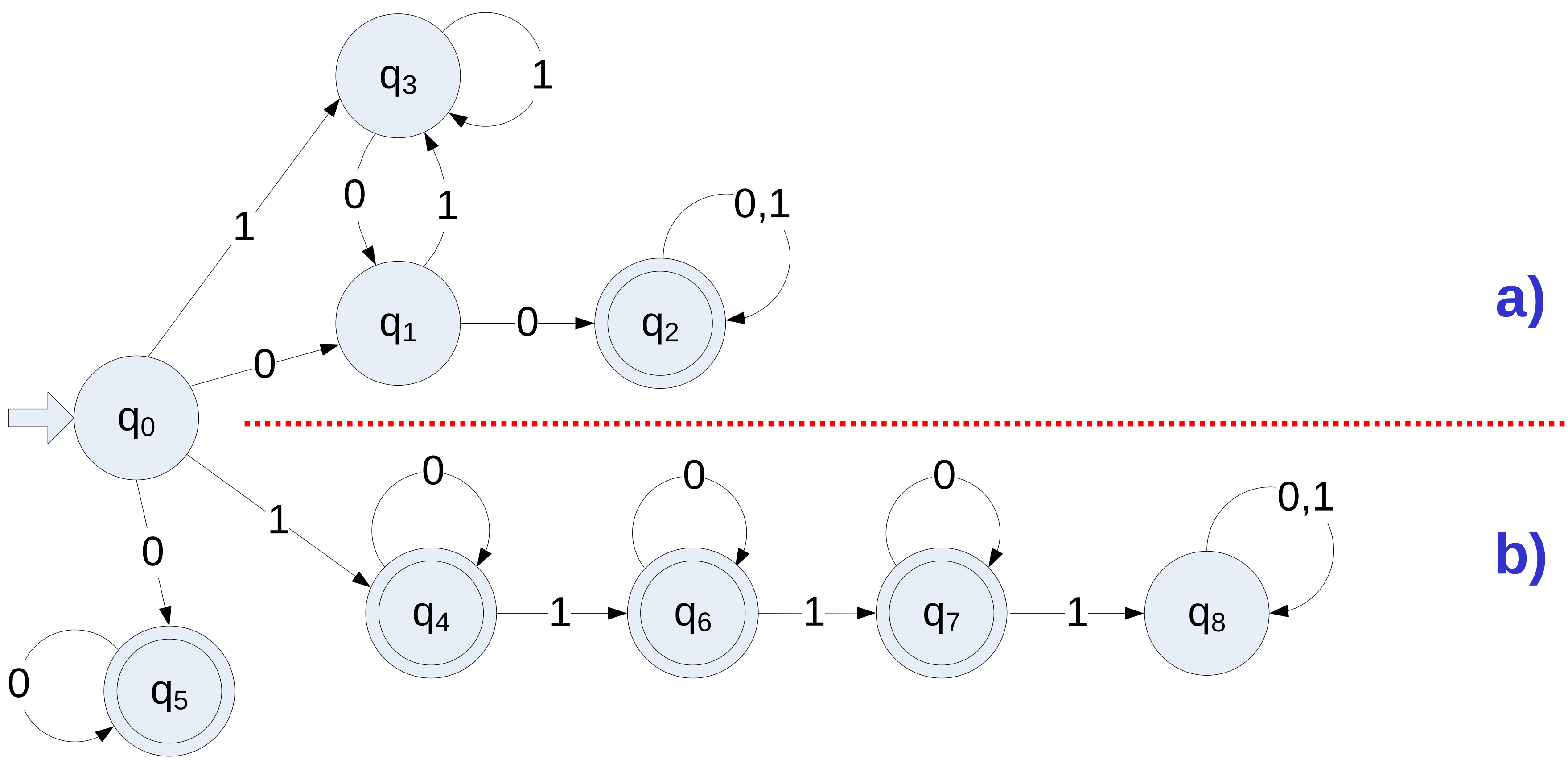

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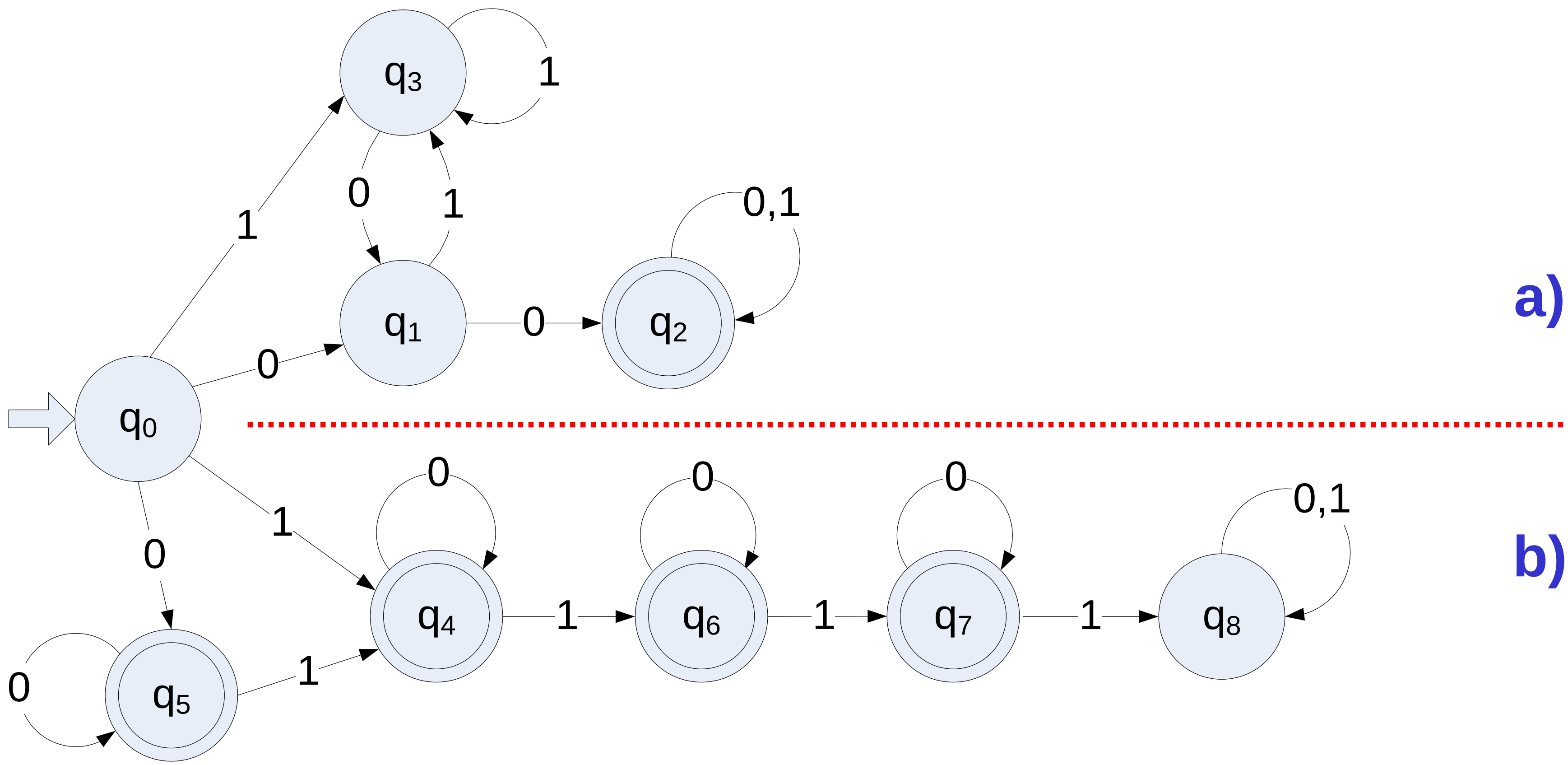

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
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q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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Procedure for DFA minimization:

a) Remove unreachable states

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_1	q_1	q_3	q_2	q_5	0
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q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

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q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states
b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states
b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states
b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states
b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

LRS = $\{q_0, q_1, q_2, q_3, q_4, q_5, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_6	q_3	q_4	q_4	q_8	0
q_7	q_2	q_4	q_4	q_0	1
q_8	q_8	q_7	q_3	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

LRS = $\{q_0, q_1, q_2, q_3, q_4, q_5, q_7\}$

Unreachable states: $\{q_6, q_8\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
~~q_6~~	~~q_3~~	~~q_4~~	~~q_4~~	~~q_8~~	~~0~~
q_7	q_2	q_4	q_4	q_0	1
~~q_8~~	~~q_8~~	~~q_7~~	~~q_3~~	~~q_6~~	~~1~~

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states:

LRS = $\{q_0, q_1, q_2, q_3, q_4, q_5, q_7\}$

Unreachable states: $\{q_6, q_8\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

Finding nondistinguishable states:

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

Finding nondistinguishable states:

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0$

$G_{22}=\{ q_1$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0$

$G_{22}=\{ q_1$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0$

$G_{22}=\{ q_1$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0$

$G_{22}=\{ q_1$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0$

$G_{22}=\{ q_1$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0$

$G_{22}=\{ q_1$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0$

$G_{22}=\{ q_1$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0, q_1, q_4, q_5 \}$

$G_{12}=\{ q_2, q_3, q_7 \}$

$G_{21}=\{ q_0$

$G_{22}=\{ q_1$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0$

$G_{22}=\{ q_1$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

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$G_{21}=\{ q_0$

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0 , q_4$

$G_{22}=\{ q_1$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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$G_{22}=\{ q_1$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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$G_{12}=\{ q_2 , q_3 , q_7 \}$

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$G_{22}=\{ q_1$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0, q_1, q_4, q_5 \}$

$G_{12}=\{ q_2, q_3, q_7 \}$

....

$G_{21}=\{ q_0, q_4, q_5 \}$

$G_{22}=\{ q_1 \}$

$G_{23}=\{ q_2, q_3, q_7 \}$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

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$G_{21}=\{ q_0 , q_4 , q_5 \}$

$G_{22}=\{ q_1 \}$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

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$G_{23}=\{ q_2 , q_3 , q_7 \}$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0 , q_4 , q_5 \}$

$G_{22}=\{ q_1 \}$

$G_{23}=\{ q_2 , q_3 , q_7 \}$

$G_{31}=\{ q_0$

$G_{32}=\{ q_4$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0 , q_4 , q_5 \}$

$G_{22}=\{ q_1 \}$

$G_{23}=\{ q_2 , q_3 , q_7 \}$

$G_{31}=\{ q_0$

$G_{32}=\{ q_4$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4 , q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0 , q_4 , q_5 \}$

$G_{22}=\{ q_1 \}$

$G_{23}=\{ q_2 , q_3 , q_7 \}$

$G_{31}=\{ q_0$

$G_{32}=\{ q_4$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

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$G_{31}=\{q_0$

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{ q_0 , q_1 , q_4, q_5 \}$

$G_{12}=\{ q_2 , q_3 , q_7 \}$

$G_{21}=\{ q_0 , q_4 , q_5 \}$

$G_{22}=\{ q_1 \}$

$G_{23}=\{ q_2 , q_3 , q_7 \}$

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

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$G_{22}=\{q_1\}$

$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

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$G_{22}=\{q_1\}$

$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

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$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

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$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

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$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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$G_{11}=\{q_0, q_1, q_4, q_5\}$

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$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

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Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

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Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

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Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

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	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

$G_{21}=\{q_0, q_4, q_5\}$

$G_{22}=\{q_1\}$

$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

$G_{21}=\{q_0, q_4, q_5\}$

$G_{22}=\{q_1\}$

$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

$G_{21}=\{q_0, q_4, q_5\}$

$G_{22}=\{q_1\}$

$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

$G_{21}=\{q_0, q_4, q_5\}$

$G_{22}=\{q_1\}$

$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

$G_{21}=\{q_0, q_4, q_5\}$

$G_{22}=\{q_1\}$

$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

$G_{21}=\{q_0, q_4, q_5\}$

$G_{22}=\{q_1\}$

$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

$G_{21}=\{q_0, q_4, q_5\}$

$G_{22}=\{q_1\}$

$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistinguishable states:

$G_{11}=\{q_0, q_1, q_4, q_5\}$

$G_{12}=\{q_2, q_3, q_7\}$

$G_{21}=\{q_0, q_4, q_5\}$

$G_{22}=\{q_1\}$

$G_{23}=\{q_2, q_3, q_7\}$

$G_{31}=\{q_0\}$

$G_{32}=\{q_4, q_5\}$

$G_{33}=\{q_1\}$

$G_{34}=\{q_2, q_3, q_7\}$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistignuishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
q_5	q_4	q_0	q_0	q_7	0
q_7	q_2	q_4	q_4	q_0	1

Finding nondistignuishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \qquad \Rightarrow q_4$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
~~q_5~~	~~q_4~~	~~q_0~~	~~q_0~~	~~q_7~~	~~0~~
q_7	q_2	q_4	q_4	q_0	1

Finding nondistignuishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \qquad \Rightarrow q_4$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_3	q_7	q_4	q_4	q_0	1
q_4	q_5	q_0	q_0	q_3	0
$\cancel{q_5}$	$\cancel{q_4}$	$\cancel{q_0}$	$\cancel{q_0}$	$\cancel{q_7}$	$\cancel{0}$
q_7	q_2	q_4	q_4	q_0	1

Finding nondistignuishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \qquad \Rightarrow q_4$

$q_2 \equiv q_3 \equiv q_7 \qquad \Rightarrow q_2$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
~~q_3~~	~~q_7~~	~~q_4~~	~~q_4~~	~~q_0~~	~~1~~
q_4	q_5	q_0	q_0	q_3	0
~~q_5~~	~~q_4~~	~~q_0~~	~~q_0~~	~~q_7~~	~~0~~
~~q_7~~	~~q_2~~	~~q_4~~	~~q_4~~	~~q_0~~	~~1~~

Finding nondistignuishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \quad \Rightarrow q_4$

$q_2 \equiv q_3 \equiv q_7 \quad \Rightarrow q_2$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_4	q_5	q_0	q_0	q_3	0

Finding nondistignuishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \quad \Rightarrow q_4$

$q_2 \equiv q_3 \equiv q_7 \quad \Rightarrow q_2$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	q_5	0
q_2	q_2	q_5	q_5	q_0	1
q_4	q_5	q_0	q_0	q_3	0

Finding nondistignuishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \quad \Rightarrow q_4$

$q_2 \equiv q_3 \equiv q_7 \quad \Rightarrow q_2$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	$\mathbf{q_4}$	0
q_2	q_2	$\mathbf{q_4}$	$\mathbf{q_4}$	q_0	1
q_4	$\mathbf{q_4}$	q_0	q_0	q_3	0

Finding nondistinguishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \quad \Rightarrow q_4$

$q_2 \equiv q_3 \equiv q_7 \quad \Rightarrow q_2$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	$\mathbf{q_4}$	0
q_2	q_2	$\mathbf{q_4}$	$\mathbf{q_4}$	q_0	1
q_4	$\mathbf{q_4}$	q_0	q_0	q_3	0

Finding nondistinguishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \quad \Rightarrow q_4$

$q_2 \equiv q_3 \equiv q_7 \quad \Rightarrow q_2$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_3	q_2	**q_4**	0
q_2	q_2	**q_4**	**q_4**	q_0	1
q_4	**q_4**	q_0	q_0	q_3	0

Finding nondistinguishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \quad \Rightarrow q_4$

$q_2 \equiv q_3 \equiv q_7 \quad \Rightarrow q_2$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	$\mathbf{q_2}$	q_2	$\mathbf{q_4}$	0
q_2	q_2	$\mathbf{q_4}$	$\mathbf{q_4}$	q_0	1
q_4	$\mathbf{q_4}$	q_0	q_0	$\mathbf{q_2}$	0

Finding nondistinguishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \quad \Rightarrow q_4$

$q_2 \equiv q_3 \equiv q_7 \quad \Rightarrow q_2$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	$\mathbf{q_2}$	q_2	$\mathbf{q_4}$	0
q_2	q_2	$\mathbf{q_4}$	$\mathbf{q_4}$	q_0	1
q_4	$\mathbf{q_4}$	q_0	q_0	$\mathbf{q_2}$	0

Finding nondistinguishable states:

$G_{31}=\{ q_0 \}$

$G_{32}=\{ q_4 , q_5 \}$

$G_{33}=\{ q_1 \}$

$G_{34}=\{ q_2 , q_3 , q_7 \}$

Nondistinguishable states :

$q_4 \equiv q_5 \quad \Rightarrow q_4$

$q_2 \equiv q_3 \equiv q_7 \quad \Rightarrow q_2$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_2	q_2	q_4	0
q_2	q_2	q_4	q_4	q_0	1
q_4	q_4	q_0	q_0	q_2	0

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_2	q_2	q_4	0
q_2	q_2	q_4	q_4	q_0	1
q_4	q_4	q_0	q_0	q_2	0

Symbol conversion:

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_2	q_2	q_4	0
q_2	q_2	q_4	q_4	q_0	1
q_4	q_4	q_0	q_0	q_2	0

Symbol conversion:

transitions for symbols b and c

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_2	q_2	q_4	0
q_2	q_2	q_4	q_4	q_0	1
q_4	q_4	q_0	q_0	q_2	0

Symbol conversion:

transitions for symbols b and c are the same

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_2	q_2	q_4	0
q_2	q_2	q_4	q_4	q_0	1
q_4	q_4	q_0	q_0	q_2	0

Symbol conversion:

transitions for symbols b and c are the same

$b \equiv c \qquad \Rightarrow e$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	b	c	d	
q_0	q_0	q_1	q_1	q_2	0
q_1	q_1	q_2	q_2	q_4	0
q_2	q_2	q_4	q_4	q_0	1
q_4	q_4	q_0	q_0	q_2	0

Symbol conversion:

transitions for symbols b and c are the same

$b \equiv c \quad \Rightarrow e$

Task 3

- Minimize given DFA using the state division algorithm (2nd algorithm). Additionally reduce the automata using symbol conversion.

	a	e={ b, c }	d	
q_0	q_0	q_1	q_2	0
q_1	q_1	q_2	q_4	0
q_2	q_2	q_4	q_0	1
q_4	q_4	q_0	q_2	0

Symbol conversion:

transitions for symbols b and c are the same

$b \equiv c \qquad \Rightarrow e$

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states
b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

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a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

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- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

LRS = $\{q_0, q_1, q_2, q_3, q_4, q_5\}$

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
q_6	q_3	q_7	q_2	0
q_7	q_1	q_4	q_6	1

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

LRS = $\{q_0, q_1, q_2, q_3, q_4, q_5\}$

Unreachable states: $\{q_6, q_7\}$

Task 4

- Minimize given DFA using the finding the distinguishable states algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1
~~q_6~~	~~q_3~~	~~q_7~~	~~q_2~~	~~0~~
~~q_7~~	~~q_1~~	~~q_4~~	~~q_6~~	~~1~~

Procedure for DFA minimization:

a) Remove unreachable states

b) Merge nondistinguishable states

Finding reachable states :

LRS = $\{q_0, q_1, q_2, q_3, q_4, q_5\}$

Unreachable states: $\{q_6, q_7\}$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

Finding distinguishable states:

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2					
q_3					
q_4					
q_5					
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2					
q_3					
q_4		X			
q_5					
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2					
q_3					
q_4		X			
q_5					
	q_0	q_1	q_2	q_3	q_4

If the pair (q_i, q_j) is marked in the table

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2					
q_3					
q_4		X			
q_5					
	q_0	q_1	q_2	q_3	q_4

If the pair (q_i, q_j) is marked in the table

$\Downarrow$

States q_i and q_j are distinguishable

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2					
q_3					
q_4		X			
q_5					
	q_0	q_1	q_2	q_3	q_4

If the pair (q_i, q_j) is marked in the table

⬇

States q_i and q_j are distinguishable

⬇

Unmarked pairs mark nondistinguishable states

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2					
q_3					
q_4					
q_5					
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2					
q_3					
q_4					
q_5					
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2					
q_3					
q_4					
q_5					
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X				
q_3					
q_4					
q_5					
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X				
q_3					
q_4	X				
q_5					
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X				
q_3					
q_4	X				
q_5	X				
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3					
q_4	X				
q_5	X				
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3					
q_4	X	X			
q_5	X				
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3					
q_4	X	X			
q_5	X	X			

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X			
q_5	X	X			

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X			
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List (q_2, q_4) $\Rightarrow$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$
List $(q_1, q_3) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$
List $(q_1, q_3) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$
List $(q_1, q_3) \Rightarrow (q_0, q_1)$
List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$
List $(q_1, q_3) \Rightarrow (q_0, q_1)$
List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)$
List $(q_1, q_3) \Rightarrow (q_0, q_1)$
List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$
List $(q_1, q_3) \Rightarrow (q_0, q_1)$
List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$
List $(q_1, q_3) \Rightarrow (q_0, q_1)$
List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$
List $(q_1, q_3) \Rightarrow (q_0, q_1)$
List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)$ (q_0, q_3)

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)\ (q_0, q_3)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)$ (q_0, q_3)

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1)
List $(q_1, q_3) \Rightarrow$ (q_0, q_1)
List $(q_4, q_5) \Rightarrow$ (q_0, q_1) (q_0, q_3)

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)\ (q_0, q_3)$

Task 4

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)\ (q_0, q_3)$

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)$ (q_0, q_3)

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q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

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- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$
List $(q_1, q_3) \Rightarrow (q_0, q_1)$
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q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)\ \ (q_0, q_3)$

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)$

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q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)$ (q_1, q_3)

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$
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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)$ (q_1, q_3)

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List $(q_4, q_5) \Rightarrow (q_0, q_1)$ (q_0, q_3)

Task 4

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q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

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Task 4

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)
List $(q_1, q_3) \Rightarrow$ (q_0, q_1) (q_2, q_4)
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Task 4

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

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Task 4

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q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$ (q_1, q_3)

List $(q_1, q_3) \Rightarrow (q_0, q_1)$ (q_2, q_4)

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Task 4

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)
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Task 4

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

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Task 4

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)\ \ (q_2, q_4)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)\ \ (q_0, q_3)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)\ \ (q_2, q_4)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)\ \ (q_0, q_3)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)\ \ (q_2, q_4)$

List $(q_4, q_5) \Rightarrow (q_0, q_1)\ \ (q_0, q_3)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X		X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

List $(q_1, q_3) \Rightarrow$ (q_0, q_1) (q_2, q_4)

List $(q_4, q_5) \Rightarrow$ (q_0, q_1) (q_0, q_3)

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

List $(q_1, q_3) \Rightarrow$ (q_0, q_1) (q_2, q_4)

List $(q_4, q_5) \Rightarrow$ (q_0, q_1) (q_0, q_3)

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

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List $(q_4, q_5) \Rightarrow (q_0, q_1)\ (q_0, q_3)$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

List $(q_1, q_3) \Rightarrow$ (q_0, q_1) (q_2, q_4)

List $(q_4, q_5) \Rightarrow$ (q_0, q_1) (q_0, q_3)

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

List $(q_1, q_3) \Rightarrow$ (q_0, q_1) (q_2, q_4)

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

List $(q_1, q_3) \Rightarrow$ (q_0, q_1) (q_2, q_4)

List $(q_4, q_5) \Rightarrow$ (q_0, q_1) (q_0, q_3)

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

List $(q_1, q_3) \Rightarrow$ (q_0, q_1) (q_2, q_4)

List $(q_4, q_5) \Rightarrow$ (q_0, q_1) (q_0, q_3)

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$ (q_1, q_3)

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- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow \quad (q_0, q_1) \quad (q_1, q_3)$

List $(q_1, q_3) \Rightarrow \quad (q_0, q_1) \quad (q_2, q_4)$

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ \ (q_1, q_3)$

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

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Task 4

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$ (q_1, q_3)

List $(q_1, q_3) \Rightarrow (q_0, q_1)$ (q_2, q_4)

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Task 4

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1					
q_2	X	X			
q_3			X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

List $(q_1, q_3) \Rightarrow (q_0, q_1)\ (q_2, q_4)$

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

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Task 4

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	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)\ (q_1, q_3)$

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow (q_0, q_1)$ (q_1, q_3)

List $(q_1, q_3) \Rightarrow (q_0, q_1)$ (q_2, q_4)

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

List $(q_1, q_3) \Rightarrow$ (q_0, q_1) (q_2, q_4)

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Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

List $(q_1, q_3) \Rightarrow$ (q_0, q_1) (q_2, q_4)

List $(q_4, q_5) \Rightarrow$ (q_0, q_1) (q_0, q_3)

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X

List $(q_2, q_4) \Rightarrow$ (q_0, q_1) (q_1, q_3)

List $(q_1, q_3) \Rightarrow$ (q_0, q_1) (q_2, q_4)

List $(q_4, q_5) \Rightarrow$ (q_0, q_1) (q_0, q_3)

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

	q_0	q_1	q_2	q_3	q_4
q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_3	q_4	q_1	q_4	0
q_4	q_3	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

Nondistinguishable states:

$q_1 \equiv q_3 \quad \Rightarrow q_1$

$q_2 \equiv q_4 \quad \Rightarrow q_2$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
$\cancel{q_3}$	$\cancel{q_4}$	$\cancel{q_1}$	$\cancel{q_4}$	$\cancel{0}$
$\cancel{q_4}$	$\cancel{q_3}$	$\cancel{q_1}$	$\cancel{q_2}$	$\cancel{1}$
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

Nondistinguishable states:

$q_1 \equiv q_3 \quad \Rightarrow q_1$

$q_2 \equiv q_4 \quad \Rightarrow q_2$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

Nondistinguishable states:

$q_1 \equiv q_3 \quad \Rightarrow q_1$

$q_2 \equiv q_4 \quad \Rightarrow q_2$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_3	q_4	0
q_2	q_1	q_3	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

Nondistinguishable states:

$q_1 \equiv q_3 \quad \Rightarrow q_1$

$q_2 \equiv q_4 \quad \Rightarrow q_2$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_1	q_4	0
q_2	q_1	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

Nondistinguishable states:

$q_1 \equiv q_3 \quad \Rightarrow q_1$

$q_2 \equiv q_4 \quad \Rightarrow q_2$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_4	q_1	q_5	0
q_1	q_2	q_1	q_4	0
q_2	q_1	q_1	q_2	1
q_5	q_2	q_4	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

Nondistinguishable states:

$q_1 \equiv q_3 \quad \Rightarrow q_1$

$q_2 \equiv q_4 \quad \Rightarrow q_2$

Task 4

- Minimize given DFA using the table filling algorithm (3rd algorithm).

	a	b	c	
q_0	q_2	q_1	q_5	0
q_1	q_2	q_1	q_2	0
q_2	q_1	q_1	q_2	1
q_5	q_2	q_2	q_1	1

Finding distinguishable states:

q_1	X				
q_2	X	X			
q_3	X		X		
q_4	X	X		X	
q_5	X	X	X	X	X
	q_0	q_1	q_2	q_3	q_4

Nondistinguishable states:

$q_1 \equiv q_3 \quad \Rightarrow q_1$

$q_2 \equiv q_4 \quad \Rightarrow q_2$

Task 5

- Given ε-NFA convert to minimal DFA.

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

Task 5

- Given ε-NFA convert to minimal DFA.

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

Algorithm:

Task 5

- Given ε-NFA convert to minimal DFA.

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

Algorithm:

1. Convert ε-NFA M_1 to NFA M_2

Task 5

- Given ε-NFA convert to minimal DFA.

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1, q_3	0
q_1	q_1, q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

Algorithm:

1. Convert ε-NFA M_1 to NFA M_2
2. Convert NFA M_2 to DFA M_3

Task 5

- Given ε-NFA convert to minimal DFA.

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

Algorithm:

1. Convert ε-NFA M_1 to NFA M_2
2. Convert NFA M_2 to DFA M_3
3. Minimize DFA M_3 to DFA M_4

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a) $\varepsilon\text{-CLOSURE}(q_0)=\{q_0, q_1, q_2, q_3\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a) ε-CLOSURE$(q_0)=\{q_0, q_1, q_2, q_3\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1, q_3	0
q_1	q_1, q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a) ε-CLOSURE$(q_0)=\{q_0, q_1, q_2, q_3\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a) ε-CLOSURE$(q_0)=\{q_0, q_1, q_2, q_3\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}
ε- CLOSURE(q_1)={q_1, q_2}

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a) ε-CLOSURE(q_0)=$\{q_0, q_1, q_2, q_3\}$

ε- CLOSURE(q_1)=$\{q_1, q_2\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)=$\{q_0, q_1, q_2, q_3\}$
ε- CLOSURE(q_1)=$\{q_1, q_2\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE$(q_0)=\{q_0, q_1, q_2, q_3\}$
ε- CLOSURE$(q_1)=\{q_1, q_2\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE$(q_0)=\{q_0, q_1, q_2, q_3\}$
ε- CLOSURE$(q_1)=\{q_1, q_2\}$

ε- CLOSURE$(q_2)=\{q_2\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}
ε- CLOSURE(q_1)={q_1, q_2}

ε- CLOSURE(q_2)={q_2}

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}
ε- CLOSURE(q_1)={q_1, q_2}

ε- CLOSURE(q_2)={q_2}

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}

ε- CLOSURE(q_1)={q_1, q_2}

ε- CLOSURE(q_2)={q_2}

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}

ε- CLOSURE(q_1)={q_1, q_2}

ε- CLOSURE(q_2)={q_2}

ε- CLOSURE(q_3)={q_3}

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA M_1=(Q, Σ, δ_1, q_0, F_1)

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}
ε- CLOSURE(q_1)={q_1, q_2}

ε- CLOSURE(q_2)={q_2}
ε- CLOSURE(q_3)={q_3}

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE$(q_0)=\{q_0, q_1, q_2, q_3\}$

ε- CLOSURE$(q_1)=\{q_1, q_2\}$

ε- CLOSURE$(q_2)=\{q_2\}$

ε- CLOSURE$(q_3)=\{q_3\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}

ε- CLOSURE(q_1)={q_1, q_2}

ε- CLOSURE(q_2)={q_2}

ε- CLOSURE(q_3)={q_3}

b)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}

ε- CLOSURE(q_1)={q_1, q_2}

ε- CLOSURE(q_2)={q_2}

ε- CLOSURE(q_3)={q_3}

b) **If** $F_1 \cap$ ε- CLOSURE(q_0)$\neq\emptyset$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

	a	b	c	
q_0				
q_1				
q_2				
q_3				

a)

ε-CLOSURE(q_0)=$\{q_0, q_1, q_2, q_3\}$

ε- CLOSURE(q_1)=$\{q_1, q_2\}$

ε- CLOSURE(q_2)=$\{q_2\}$

ε- CLOSURE(q_3)=$\{q_3\}$

b) **If** $F_1 \cap$ ε- CLOSURE(q_0)$\neq\emptyset$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ → $F_2 = \{q_0,q_2\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				1
q_1				0
q_2				1
q_3				0

a) ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}
ε- CLOSURE(q_1)={q_1, q_2}
ε- CLOSURE(q_2)={q_2}
ε- CLOSURE(q_3)={q_3}

b) **If** $F_1 \cap$ ε- CLOSURE$(q_0) \neq \emptyset$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ $\rightarrow$ $F_2 = \{q_0,q_2\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				1
q_1				0
q_2				1
q_3				0

a)

ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}

ε- CLOSURE(q_1)={q_1, q_2}

ε- CLOSURE(q_2)={q_2}

ε- CLOSURE(q_3)={q_3}

b) **If** $F_1 \cap$ ε- CLOSURE(q_0)$\neq\emptyset$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ → $F_2 = \{q_0,q_2\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				1
q_1				0
q_2				1
q_3				0

a)

ε-CLOSURE(q_0)=$\{q_0, q_1, q_2, q_3\}$

ε- CLOSURE(q_1)=$\{q_1, q_2\}$

ε- CLOSURE(q_2)=$\{q_2\}$

ε- CLOSURE(q_3)=$\{q_3\}$

b) **If** $F_1 \cap$ ε- CLOSURE$(q_0) \neq \emptyset$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ $\rightarrow$ $F_2 = \{q_0,q_2\}$

c)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				1
q_1				0
q_2				1
q_3				0

a) ε-CLOSURE$(q_0)=\{q_0, q_1, q_2, q_3\}$
ε- CLOSURE$(q_1)=\{q_1, q_2\}$
ε- CLOSURE$(q_2)=\{q_2\}$
ε- CLOSURE$(q_3)=\{q_3\}$

b) **If** $F_1 \cap \varepsilon$- CLOSURE$(q_0)\neq\varnothing$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ $\rightarrow$ $F_2 = \{q_0,q_2\}$

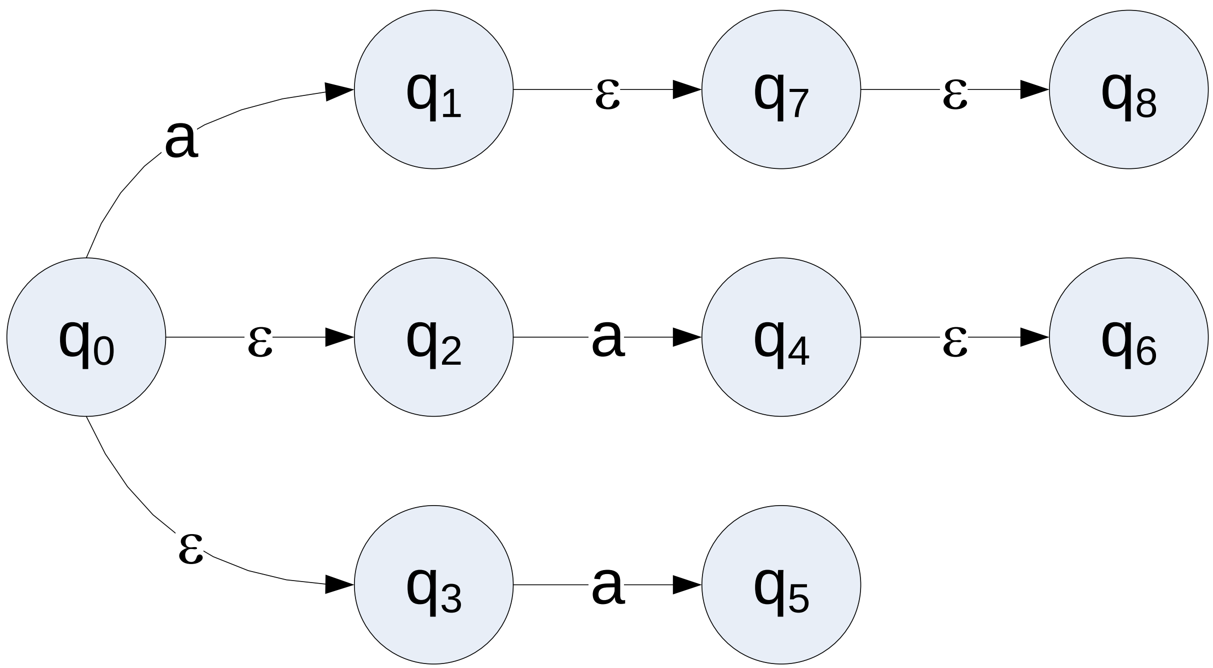
c) $\delta_2(q,a) =$ **?**

Task 5

Calculating NFA's transition function from ε-NFA's transition function.

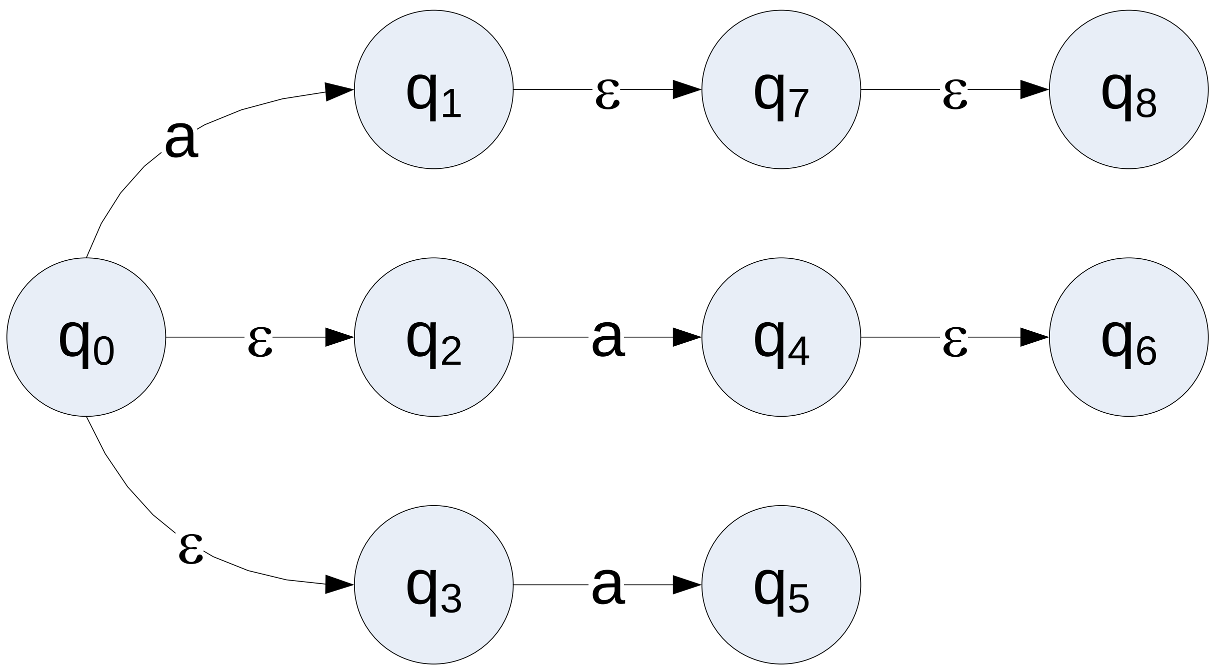
Task 5

Calculating NFA's transition function from ε-NFA's transition function.



Task 5

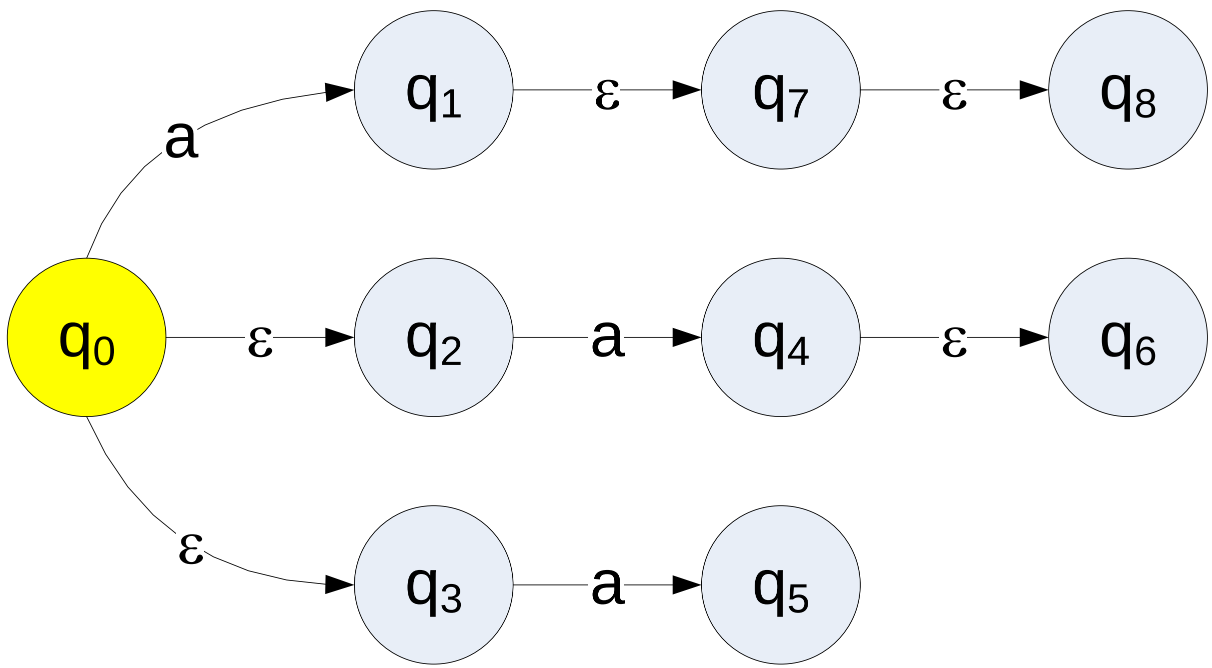
Calculating NFA's transition function from ε-NFA's transition function.



$\delta_{NFA}(q_0, a) =$

Task 5

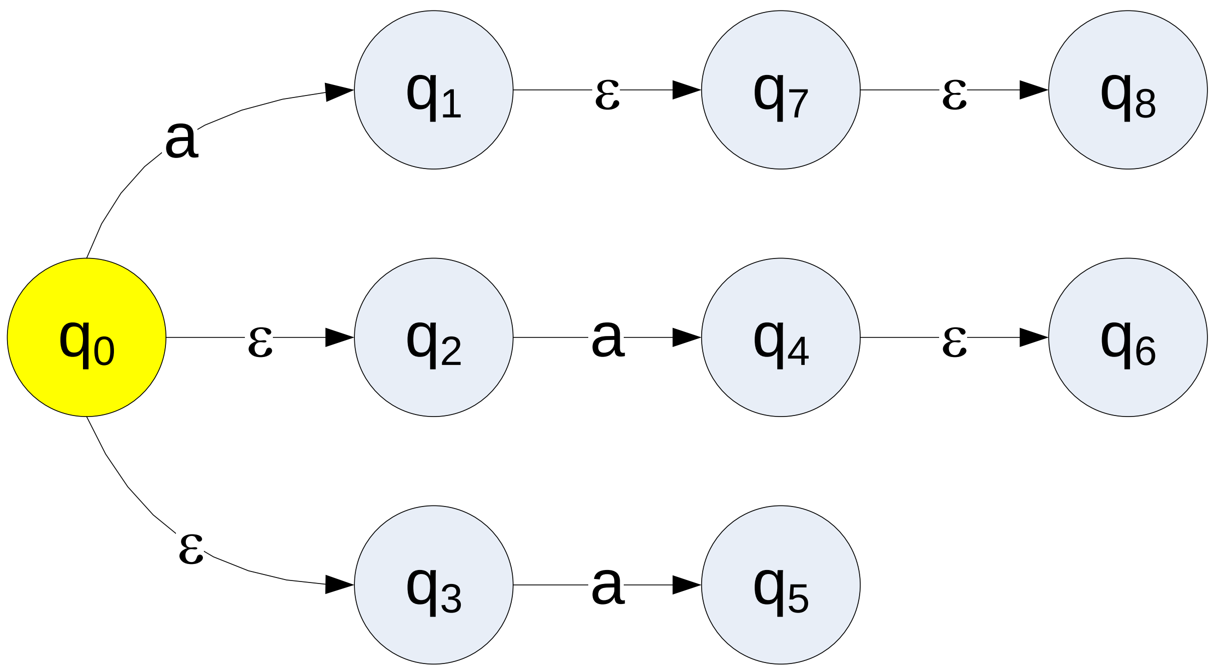
Calculating NFA's transition function from ε-NFA's transition function.



$\delta_{NFA}(q_0, a) =$

Task 5

Calculating NFA's transition function from ε-NFA's transition function.

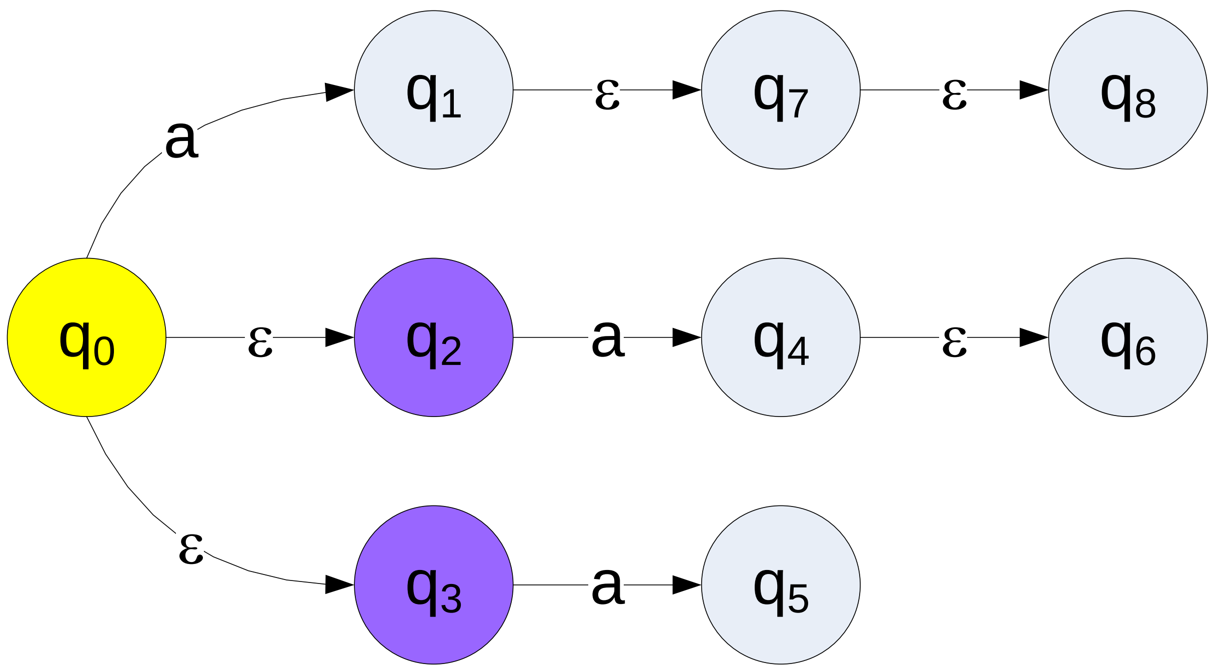


$\delta_{NFA}(q_0, a) =$

q_0

Task 5

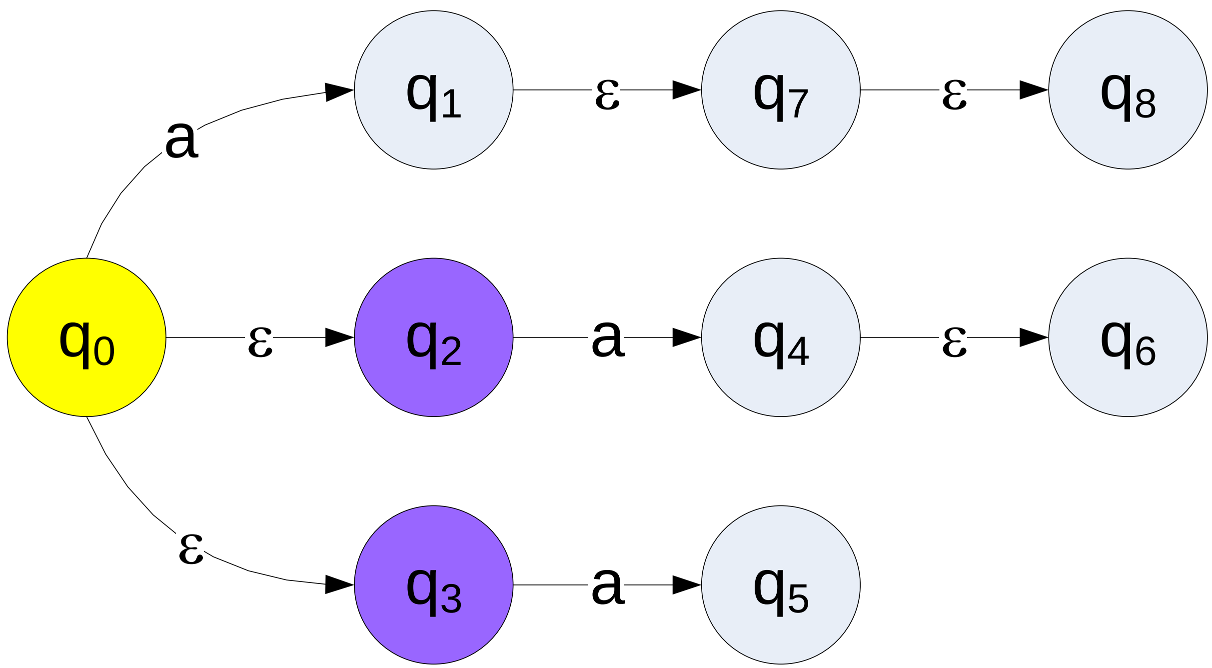
Calculating NFA's transition function from ε-NFA's transition function.



$\delta_{NFA}(q_0, a) =$ q_0

Task 5

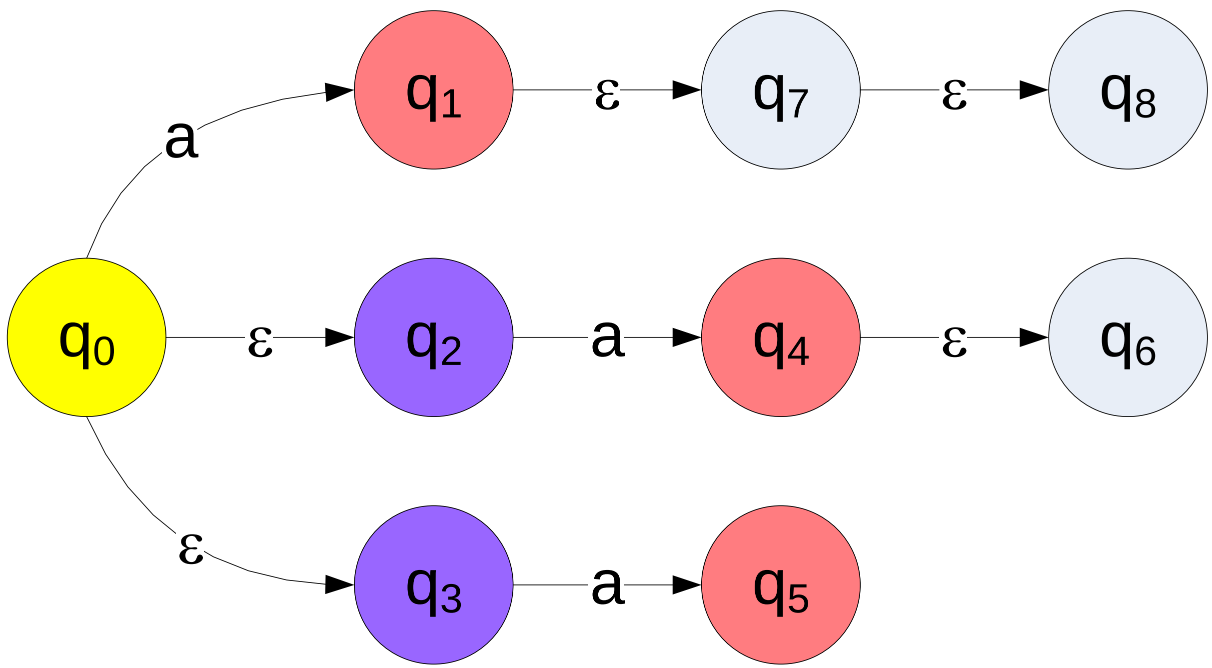
Calculating NFA's transition function from ε-NFA's transition function.



$\delta_{NFA}(q_0, a) =$ ε- CLOSURE(q_0)

Task 5

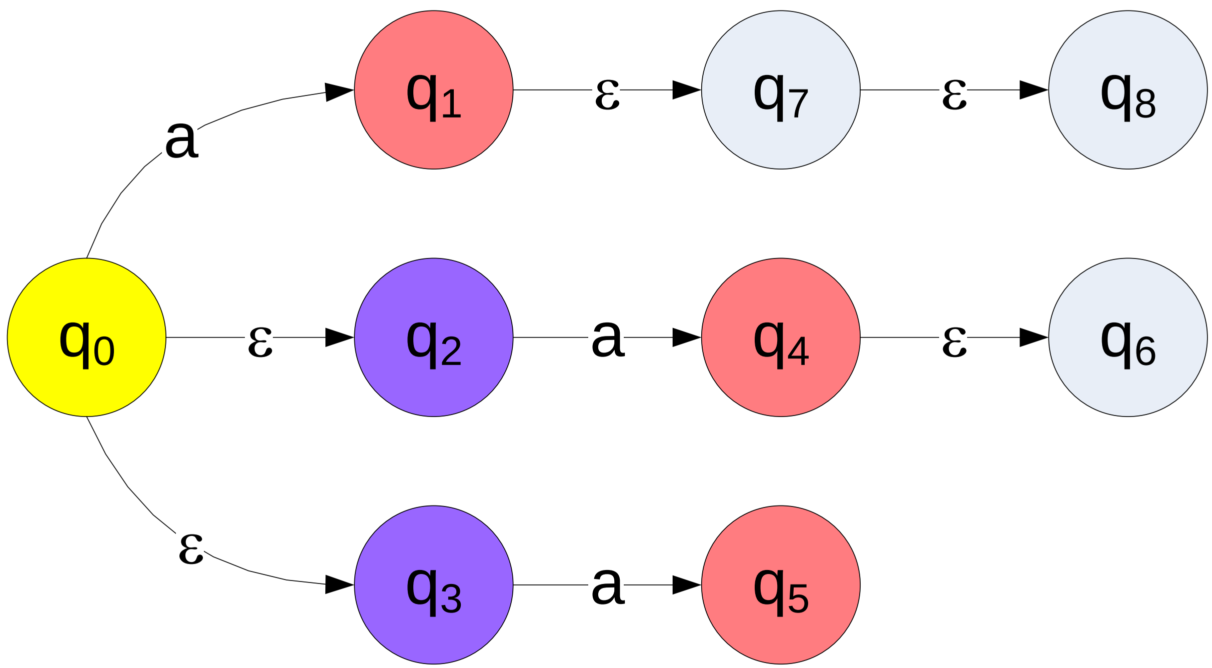
Calculating NFA's transition function from ε-NFA's transition function.



$\delta_{NFA}(q_0, a) =$ ε- CLOSURE(q_0)

Task 5

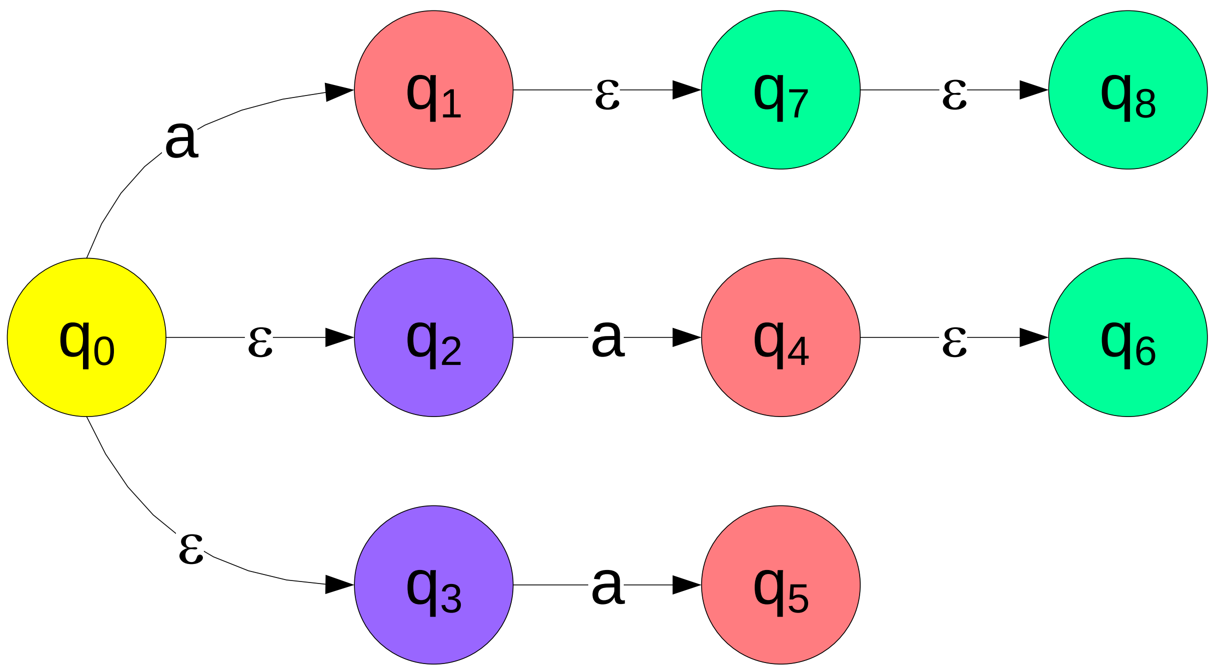
Calculating NFA's transition function from ε-NFA's transition function.



$\delta_{NFA}(q_0, a) =$ $\delta_{\varepsilon\text{-}NFA}($ ε- CLOSURE(q_0) , a)

Task 5

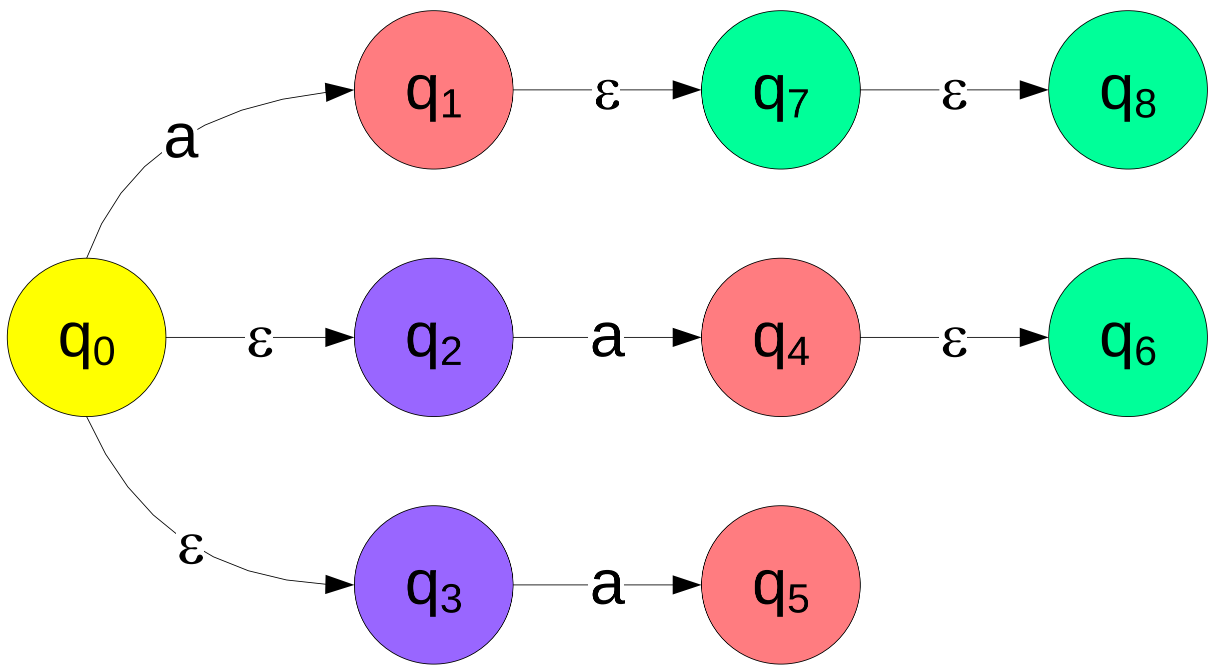
Calculating NFA's transition function from ε-NFA's transition function.



$\delta_{NFA}(q_0, a) =$ $\delta_{\varepsilon\text{-NFA}}(\ \varepsilon\text{- CLOSURE}(\ q_0\ )\ , a\ )$

Task 5

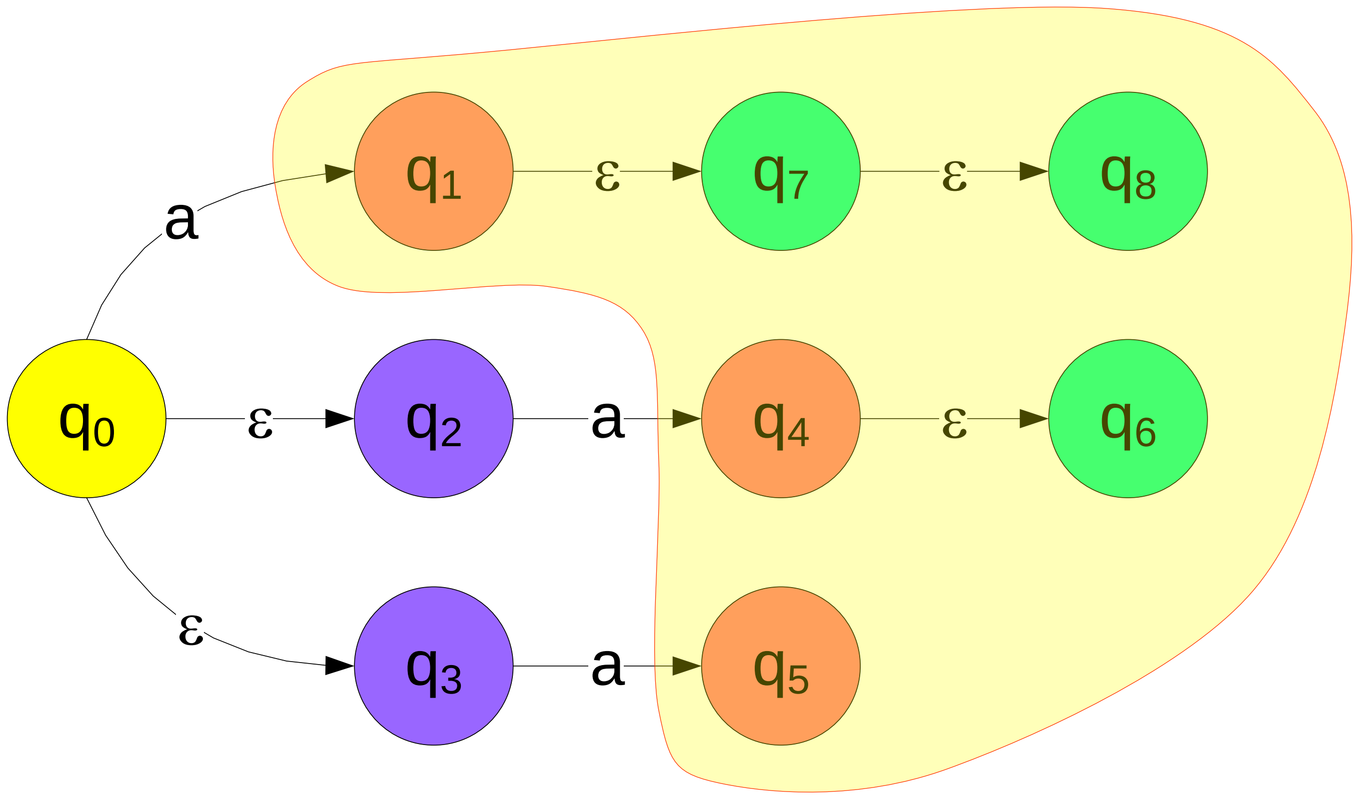
Calculating NFA's transition function from ε-NFA's transition function.



$\delta_{NFA}(q_0, a) = $ ε- CLOSURE ($\delta_{\varepsilon\text{-}NFA}($ ε- CLOSURE(q_0) , a))

Task 5

Calculating NFA's transition function from ε-NFA's transition function.



$\delta_{NFA}(q_0, a) =$ ε- CLOSURE ($\delta_{\varepsilon\text{-}NFA}$(ε- CLOSURE(q_0) , a))

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				1
q_1				0
q_2				1
q_3				0

a) ε-CLOSURE$(q_0)=\{q_0, q_1, q_2, q_3\}$
ε- CLOSURE$(q_1)=\{q_1, q_2\}$
ε- CLOSURE$(q_2)=\{q_2\}$
ε- CLOSURE$(q_3)=\{q_3\}$

b) **If** $F_1 \cap \varepsilon$- CLOSURE$(q_0) \neq \emptyset$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ $\rightarrow$ $F_2 = \{q_0,q_2\}$

c)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

	a	b	c	
q_0				1
q_1				0
q_2				1
q_3				0

a) ε-CLOSURE$(q_0)=\{q_0, q_1, q_2, q_3\}$

ε- CLOSURE$(q_1)=\{q_1, q_2\}$

ε- CLOSURE$(q_2)=\{q_2\}$

ε- CLOSURE$(q_3)=\{q_3\}$

b) **If** $F_1 \cap \varepsilon$- CLOSURE$(q_0)\neq\emptyset$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ $\rightarrow$ $F_2 = \{q_0,q_2\}$

c) $\delta_2(q,a) = \delta_1\text{^}(q,a) = \varepsilon$- CLOSURE$(\delta_1(\varepsilon$- CLOSURE$(q),a))$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				1
q_1				0
q_2				1
q_3				0

a) $\varepsilon\text{-CLOSURE}(q_0)=\{q_0, q_1, q_2, q_3\}$

$\varepsilon\text{- CLOSURE}(q_1)=\{q_1, q_2\}$

$\varepsilon\text{- CLOSURE}(q_2)=\{q_2\}$

$\varepsilon\text{- CLOSURE}(q_3)=\{q_3\}$

b) **If** $F_1 \cap \varepsilon\text{- CLOSURE}(q_0) \neq \emptyset$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1 \rightarrow F_2 = \{q_0,q_2\}$

c) $\delta_2(q,a) = \delta_1\hat{}(q,a) = \varepsilon\text{- CLOSURE}(\delta_1(\varepsilon\text{- CLOSURE}(q),a))$

$\delta_2(q_0,a)=\varepsilon\text{- CLOSURE}(\delta_1(\varepsilon\text{- CLOSURE}(q_0),a))$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				1
q_1				0
q_2				1
q_3				0

a) ε-CLOSURE(q_0)={q_0, q_1, q_2, q_3}
ε- CLOSURE(q_1)={q_1, q_2}
ε- CLOSURE(q_2)={q_2}
ε- CLOSURE(q_3)={q_3}

b) **If** $F_1 \cap$ ε- CLOSURE(q_0)$\neq\varnothing$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ → $F_2 = \{q_0,q_2\}$

c) $\delta_2(q,a) = \delta_1\hat{}(q,a) =$ ε- CLOSURE(δ_1(ε- CLOSURE(q),a))

$\delta_2(q_0,a)$=ε- CLOSURE(δ_1(ε- CLOSURE(q_0),a))
=ε- CLOSURE($\delta_1(\{q_0,q_1,q_2,q_3\},a)$)

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0				1
q_1				0
q_2				1
q_3				0

a)

ε-CLOSURE(q_0)=$\{q_0, q_1, q_2, q_3\}$

ε- CLOSURE(q_1)=$\{q_1, q_2\}$

ε- CLOSURE(q_2)=$\{q_2\}$

ε- CLOSURE(q_3)=$\{q_3\}$

b) **If** $F_1 \cap$ ε- CLOSURE(q_0)$\neq\varnothing$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ → $F_2 = \{q_0,q_2\}$

c)

$\delta_2(q,a) = \delta_1\text{^}(q,a) = \varepsilon\text{- CLOSURE}(\delta_1(\varepsilon\text{- CLOSURE}(q),a))$

$\delta_2(q_0,a)=\varepsilon\text{- CLOSURE}(\delta_1(\varepsilon\text{- CLOSURE}(q_0),a))$

$=\varepsilon\text{- CLOSURE}(\delta_1(\{q_0,q_1,q_2,q_3\},a))$

$=\varepsilon\text{- CLOSURE}(\{q_1,q_2\}) = \{q_1,q_2\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2			1
q_1				0
q_2				1
q_3				0

a)
ε-CLOSURE$(q_0)=\{q_0, q_1, q_2, q_3\}$
ε- CLOSURE$(q_1)=\{q_1, q_2\}$
ε- CLOSURE$(q_2)=\{q_2\}$
ε- CLOSURE$(q_3)=\{q_3\}$

b) **If** $F_1 \cap \varepsilon$- CLOSURE$(q_0)\neq\emptyset$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ $\rightarrow$ $F_2 = \{q_0,q_2\}$

c)
$\delta_2(q,a) = \delta_1\text{^}(q,a) = \varepsilon$- CLOSURE$(\delta_1(\varepsilon$- CLOSURE$(q),a))$

$\delta_2(q_0,a)=\varepsilon$- CLOSURE$(\delta_1(\varepsilon$- CLOSURE$(q_0),a))$
$=\varepsilon$- CLOSURE$(\delta_1(\{q_0,q_1,q_2,q_3\},a))$
$=\varepsilon$- CLOSURE$(\{q_1,q_2\}) = \{q_1,q_2\}$

Task 5

1. Convert ε-NFA M_1 to NFA M_2

ε-NFA $M_1=(Q, \Sigma, \delta_1, q_0, F_1)$

	a	b	c	ε	
q_0	q_1	q_2	q_1	q_1,q_3	0
q_1	q_1,q_2	q_1	q_3	q_2	0
q_2	q_2	q_1	q_3	-	1
q_3	q_2	-	-	-	0

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

a) ε-CLOSURE(q_0)=$\{q_0, q_1, q_2, q_3\}$
ε- CLOSURE(q_1)=$\{q_1, q_2\}$
ε- CLOSURE(q_2)=$\{q_2\}$
ε- CLOSURE(q_3)=$\{q_3\}$

b) **If** $F_1 \cap$ ε- CLOSURE(q_0)$\neq\emptyset$ **then** $F_2 = F_1 \cup q_0$ **else** $F_2 = F_1$ → $F_2 = \{q_0,q_2\}$

c) $\delta_2(q,a) = \delta_1\hat{}(q,a) =$ ε- CLOSURE(δ_1(ε- CLOSURE(q),a))

$\delta_2(q_0,a)$=ε- CLOSURE(δ_1(ε- CLOSURE(q_0),a))
=ε- CLOSURE($\delta_1(\{q_0,q_1,q_2,q_3\},a)$)
=ε- CLOSURE($\{q_1,q_2\}$) = $\{q_1,q_2\}$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\dots,q_m]$
   a) $q_{03} = [q_0]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA M_3=(Q_3, Σ, δ_3, q_{03}, F_3)

	a	b	c	
$[q_0]$				

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,...,q_m]$
   a) $q_{03} = [q_0]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$				

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA M_3=(Q_3, Σ, δ_3, q_{03}, F_3)

	a	b	c	
$[q_0]$				

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$				

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$				

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA M_3=(Q_3, Σ, δ_3, q_{03}, F_3)

	a	b	c	
$[q_0]$	$[q_1,q_2]$			

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$			

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{\, \boldsymbol{P} \,\}, a) = \{\, \boldsymbol{R} \,\}$ **then** $\delta_3([\, \boldsymbol{P} \,], a) = [\, \boldsymbol{R} \,]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$			

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{\boldsymbol{P}\}, a) = \{\boldsymbol{R}\}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$			

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,...,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$		

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,...,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{\, \boldsymbol{P} \,\}, a) = \{\, \boldsymbol{R} \,\}$ **then** $\delta_3([\, \boldsymbol{P} \,], a) = [\, \boldsymbol{R} \,]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$		

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,...,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA M_3=(Q_3, Σ, δ_3, q_{03}, F_3)

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$
   c) We add only those states that appeared on the right side (reachable states)

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{\ \boldsymbol{P}\ \}, a) = \{\ \boldsymbol{R}\ \}$ **then** $\delta_3([\ \boldsymbol{P}\ ], a) = [\ \boldsymbol{R}\ ]$
   c) We add only those states that appeared on the right side (reachable states)

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$				
$[q_1,q_2,q_3]$				

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,...,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$
   c) We add only those states that appeared on the right side (reachable states)

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$				
$[q_1,q_2,q_3]$				

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,...,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$
   c) We add only those states that appeared on the right side (reachable states)

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$				
$[q_1,q_2,q_3]$				

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Task 5

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NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$				
$[q_1,q_2,q_3]$				

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA M_3=(Q_3, Σ, δ_3, q_{03}, F_3)

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$				
$[q_1,q_2,q_3]$				

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$			
$[q_1,q_2,q_3]$				

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA M_3=(Q_3, Σ, δ_3, q_{03}, F_3)

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$			
$[q_1,q_2,q_3]$				

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$			
$[q_1,q_2,q_3]$				

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA M_3=(Q_3, Σ, δ_3, q_{03}, F_3)

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$			
$[q_1,q_2,q_3]$				

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$		
$[q_1,q_2,q_3]$				

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$		
$[q_1,q_2,q_3]$				

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$				

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$				
$[q_2]$				

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\emptyset]$	$[\emptyset]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\emptyset]$				

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   a) $q_{03} = [q_0]$
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   c) We add only those states that appeared on the right side (reachable states)

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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2. F_3 is the set of all states $[p_0, p_1, \ldots, p_j]$ where at least one state is $p_k \in F$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
   a) $q_{03} = [q_0]$
   b) **If** $\delta_2(\{ \boldsymbol{P} \}, a) = \{ \boldsymbol{R} \}$ **then** $\delta_3([\boldsymbol{P}], a) = [\boldsymbol{R}]$
   c) We add only those states that appeared on the right side (reachable states)
2. F_3 is the set of all states $[p_0, p_1, \ldots, p_j]$ where at least one state is $p_k \in F$

Task 5

2. Convert NFA M_2 to DFA M_3

NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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Task 5

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	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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Task 5

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	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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Task 5

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NFA $M_2=(Q, \Sigma, \delta_2, q_0, F_2)$

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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Task 5

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	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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Task 5

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	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA $M_3=(Q_3, \Sigma, \delta_3, q_{03}, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	

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Task 5

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NFA M_2=(Q, Σ, δ_2, q_0, F_2)

	a	b	c	
q_0	q_1,q_2	q_1,q_2	q_1,q_2,q_3	1
q_1	q_1,q_2	q_1,q_2	q_3	0
q_2	q_2	q_1,q_2	q_3	1
q_3	q_2	-	-	0

DFA M_3=(Q_3, Σ, δ_3, q_{03}, F_3)

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	0
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	0

1. $Q_3 = 2^Q \rightarrow$ we introduce composite states of shape $[q_0,q_1,\ldots,q_m]$
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Task 5

3. Minimize DFA M_3 to DFA M_4

DFA $M_3=(Q', \Sigma, \delta_3, q'_0, F_3)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	0
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	0

Task 5

3. Minimize DFA M_3 to DFA M_4

DFA M_3=(Q', Σ, δ_3, q'_0, F_3)

DFA M_4=(Q'', Σ, δ_4, q'_0, F_4)

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	0
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	0

Task 5

3. Minimize DFA M_3 to DFA M_4

DFA M_3=(Q', Σ, δ_3, q'_0, F_3)

DFA M_4=(Q'', Σ, δ_4, q'_0, F_4)

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	0
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	0

- Applying one of the minimization algorithms:

Task 5

3. Minimize DFA M_3 to DFA M_4

DFA $M_3=(Q', \Sigma, \delta_3, q'_0, F_3)$

DFA $M_4=(Q'', \Sigma, \delta_4, q'_0, F_4)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	0
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	0

- Applying one of the minimization algorithms:
  - Nondistiguishable states: $[q_2] \equiv [q_1,q_2] \equiv [q_1,q_2,q_3]$
  -

Task 5

3. Minimize DFA M_3 to DFA M_4

DFA $M_3=(Q', \Sigma, \delta_3, q'_0, F_3)$

DFA $M_4=(Q'', \Sigma, \delta_4, q'_0, F_4)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	0
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	0

- Applying one of the minimization algorithms:
  - Nondistiguishable states: $[q_2] \equiv [q_1,q_2] \equiv [q_1,q_2,q_3]$
  - Replace $[q_1,q_2] \rightarrow [q_2]$
  -

Task 5

3. Minimize DFA M_3 to DFA M_4

DFA $M_3=(Q', \Sigma, \delta_3, q'_0, F_3)$

DFA $M_4=(Q'', \Sigma, \delta_4, q'_0, F_4)$

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	0
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	0

- Applying one of the minimization algorithms:
  - Nondistiguishable states: $[q_2] \equiv [q_1,q_2] \equiv [q_1,q_2,q_3]$
  - Replace $[q_1,q_2] \rightarrow [q_2]$
    $[q_1,q_2,q_3] \rightarrow [q_2]$

Task 5

3. Minimize DFA M_3 to DFA M_4

DFA M_3=(Q', Σ, δ_3, q'_0, F_3)

	a	b	c	
$[q_0]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2,q_3]$	1
$[q_1,q_2]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_1,q_2,q_3]$	$[q_1,q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	0
$[q_2]$	$[q_2]$	$[q_1,q_2]$	$[q_3]$	1
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	0

DFA M_4=(Q'', Σ, δ_4, q'_0, F_4)

	a	b	c	
$[q_0]$	$[q_2]$	$[q_2]$	$[q_2]$	1
$[q_2]$	$[q_2]$	$[q_2]$	$[q_3]$	1
$[q_3]$	$[q_2]$	$[\varnothing]$	$[\varnothing]$	0
$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	$[\varnothing]$	0

- Applying one of the minimization algorithms:
  - Nondistiguishable states: $[q_2] \equiv [q_1,q_2] \equiv [q_1,q_2,q_3]$
  - Replace $[q_1,q_2] \rightarrow [q_2]$
    $[q_1,q_2,q_3] \rightarrow [q_2]$

Task 6

- Construct DFA that accepts language $L = L_1 \cap L_2$ ($L_1 \cup L_2$, $L_1 - L_2$, $L_2 - L_1$). Language L_1 is made out of sequences described by the reqular expression $r_1=a^*b^*c^*$. Sequences of the language L_2 are described by the regular expression $r_2=a^*(b+c)^*$.

Task 6

- Construct DFA that accepts language $L = L_1 \cap L_2$ ($L_1 \cup L_2$, L_1-L_2, L_2-L_1). Language L_1 is made out of sequences described by the reqular expression $r_1=a^*b^*c^*$. Sequences of the language L_2 are described by the regular expression $r_2=a^*(b+c)^*$.

Algorithm:

Task 6

- Construct DFA that accepts language $L = L_1 \cap L_2$ ($L_1 \cup L_2$, $L_1 - L_2$, $L_2 - L_1$). Language L_1 is made out of sequences described by the reqular expression $r_1 = a^* b^* c^*$. Sequences of the language L_2 are described by the regular expression $r_2 = a^*(b+c)^*$.

Algorithm:

1. Construct DFA M_1 which accepts L_1

Task 6

- Construct DFA that accepts language $L = L_1 \cap L_2$ ($L_1 \cup L_2$, L_1-L_2, L_2-L_1). Language L_1 is made out of sequences described by the reqular expression $r_1=a^*b^*c^*$. Sequences of the language L_2 are described by the regular expression $r_2=a^*(b+c)^*$.

Algorithm:

1. Construct DFA M_1 which accepts L_1
2. Construct DFA M_2 which accepts L_2

Task 6

- Construct DFA that accepts language $L = L_1 \cap L_2$ ($L_1 \cup L_2$, $L_1 - L_2$, $L_2 - L_1$). Language L_1 is made out of sequences described by the reqular expression $r_1 = a^* b^* c^*$. Sequences of the language L_2 are described by the regular expression $r_2 = a^*(b+c)^*$.

Algorithm:

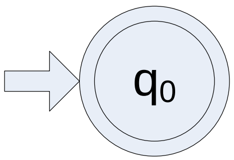
1. Construct DFA M_1 which accepts L_1
2. Construct DFA M_2 which accepts L_2
3. Construct DFA M_3 which accepts $L = L_1 \cap L_2$

Task 6

L_1 … $r_1 = a^* b^* c^*$

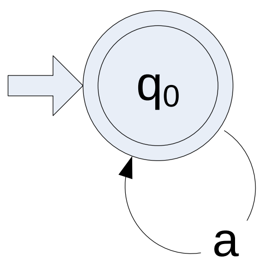
Task 6

L_1 … $r_1 = a^* b^* c^*$



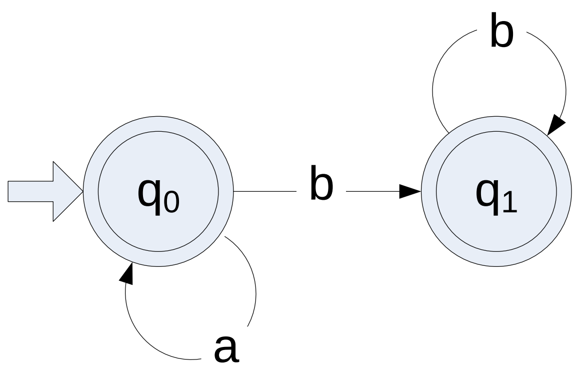
Task 6

$L_1 \ldots r_1 = a^* b^* c^*$



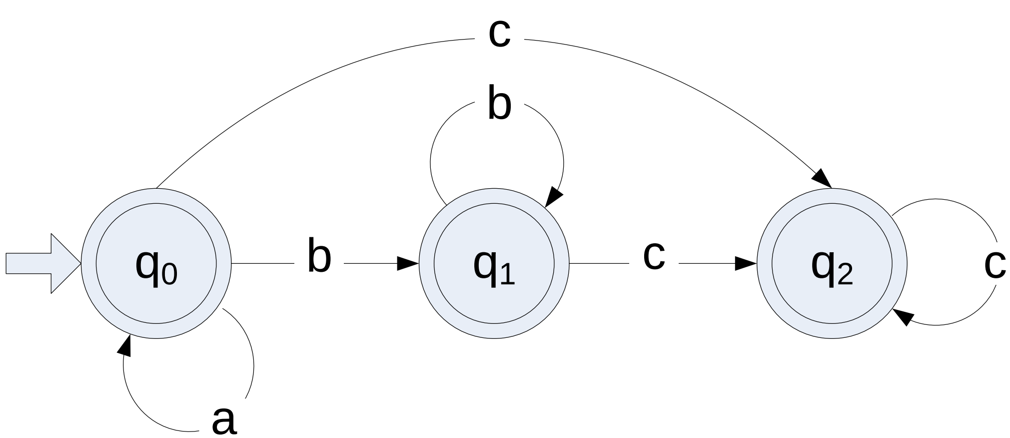
Task 6

$L_1 \ldots r_1 = a^* b^* c^*$



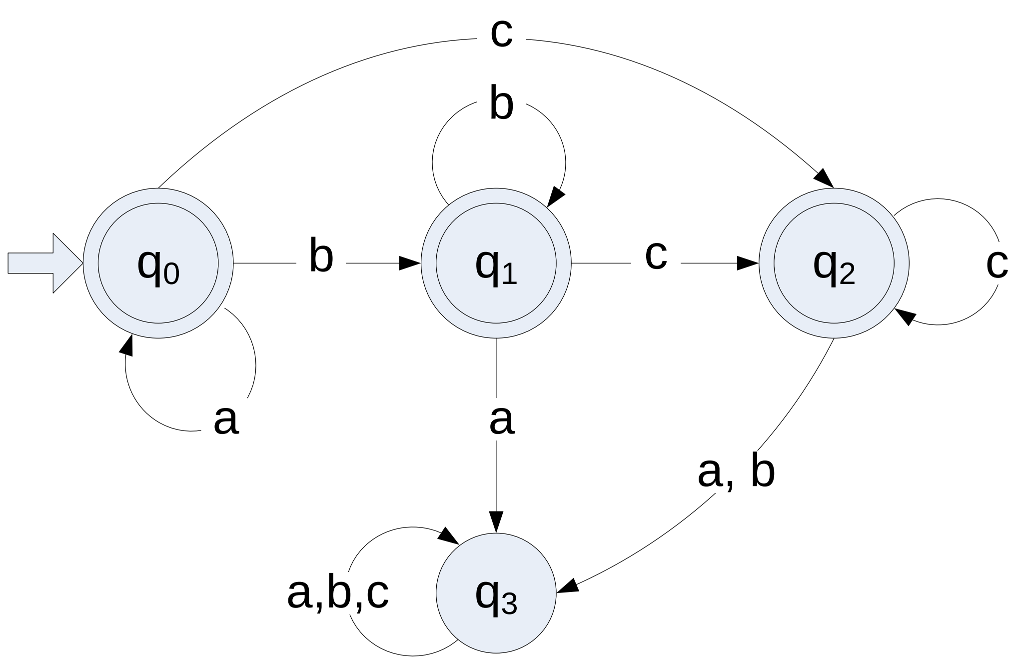
Task 6

$L_1 \ldots r_1 = a^* b^* c^*$



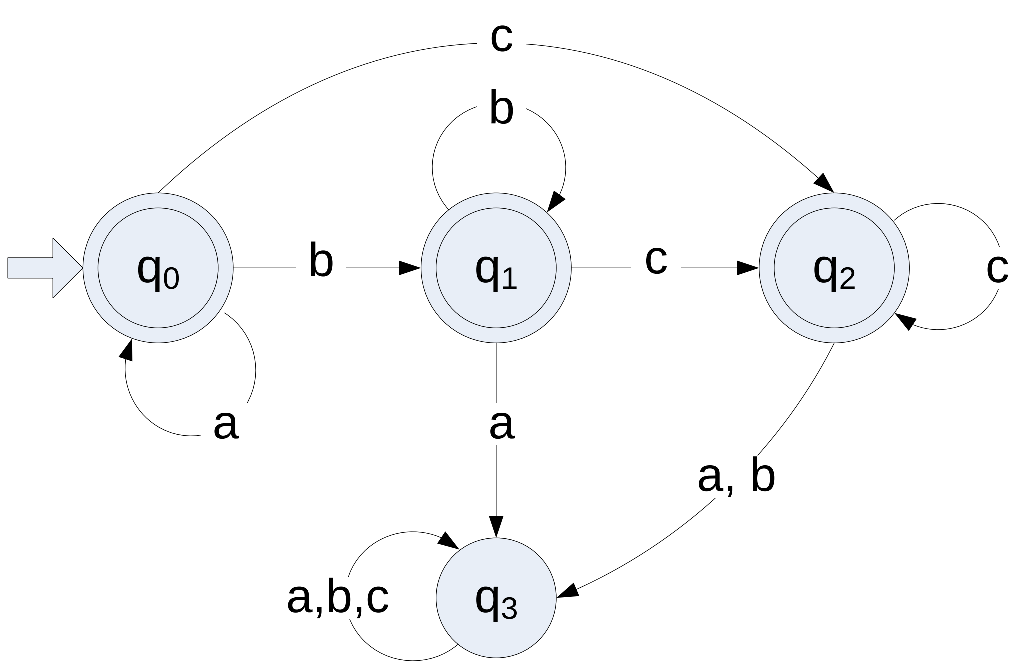
Task 6

$L_1 \ldots r_1 = a^* b^* c^*$



Task 6

$L_1 \ldots r_1 = a^* b^* c^*$



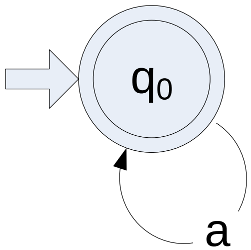
	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

Task 6

L_2 … $r_2 = a^*(b+c)^*$

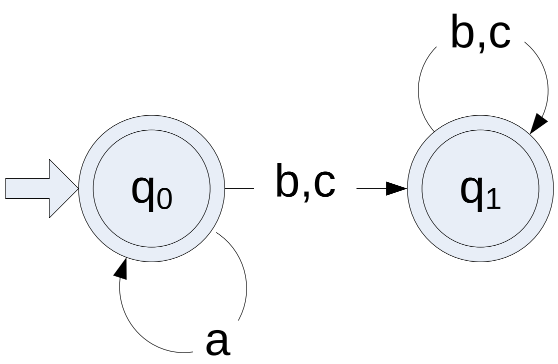
Task 6

$$L_2 \ldots\ r_2 = a^*(b+c)^*$$



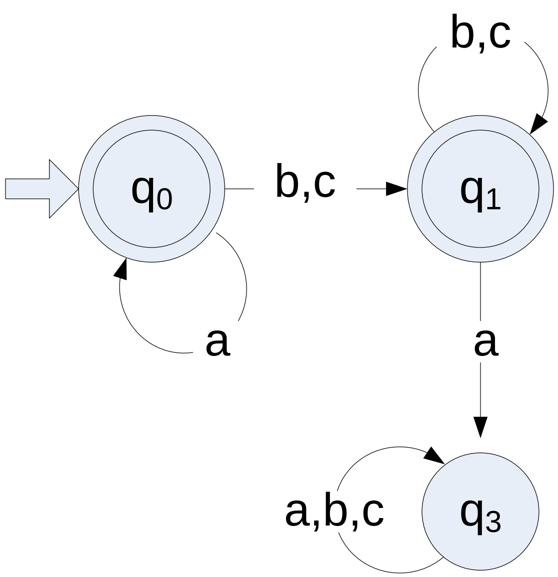
Task 6

$L_2 \ldots r_2 = a^*(b+c)^*$



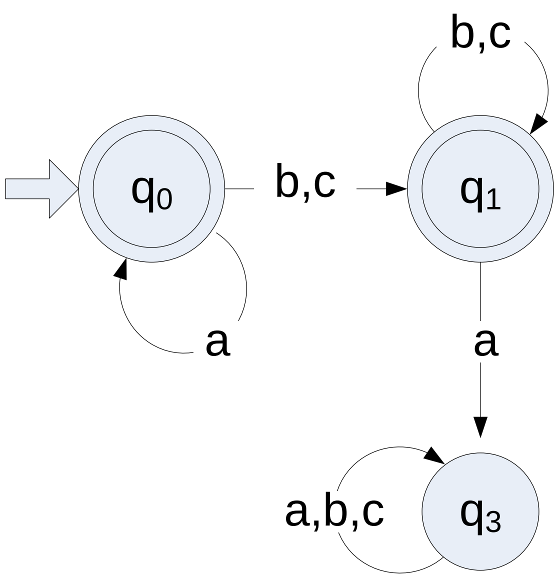
Task 6

$L_2 \ldots r_2 = a^*(b+c)^*$



Task 6

$L_2 \ldots r_2 = a^*(b+c)^*$



	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1\ \mathit{op}\ L_2$

Task 6

$L_1 \ldots r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1 \, op \, L_2$

	a	b	c	

Task 6

$L_1 \ldots r_1 = a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1\ op\ L_2$

	a	b	c	
$[q_0, q_0]$				

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$				

Task 6

$L_1 \ldots r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$				

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$				

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$			

Task 6

L_1 … $r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

L_2 … $r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

L_3 … L_1 *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$			

Task 6

$L_1 \ldots r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$			

Task 6

$L_1 \ldots r_1 = a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$		

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1 \; op \; L_2$

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$		

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	

Task 6

L_1 … $r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

L_2 … $r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

L_3 … L_1 *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	

Task 6

$L_1 \dots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \dots r_2 = a^* (b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \dots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_1,q_1]$				
$[q_2,q_1]$				

Task 6

L_1 … $r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

L_2 … $r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

L_3 … L_1 *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_1,q_1]$				
$[q_2,q_1]$				

Task 6

$L_1 \ldots r_1 = a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	

Task 6

$L_1 \ldots r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1\ op\ L_2$

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$				
$[q_3,q_1]$				

Task 6

$L_1 \ldots r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$				
$[q_3,q_1]$				

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1 \; op \; L_2$

	a	b	c	$L_1 \cap L_2$
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	

Task 6

$L_1 \ldots r_1 = a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	$L_1 \cap L_2$
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	

Task 6

L_1 … $r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

L_2 … $r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

L_3 … L_1 *op* L_2

	a	b	c	$L_1 \cap L_2$
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	

Task 6

$L_1 \ldots r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	$L_1 \cap L_2$
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	1
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	

Task 6

$L_1 \ldots r_1 = a^* b^* c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1 \; op \; L_2$

	a	b	c	$L_1 \cap L_2$
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	1
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	

Task 6

$L_1 \ldots r_1 = a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2 = a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	$L_1 \cap L_2$
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	1
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	

Task 6

$L_1 \ldots r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	$L_1 \cap L_2$
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	1
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	

Task 6

$L_1 \ldots r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	$L_1 \cap L_2$
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	1
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	1
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	

Task 6

$L_1 \ldots r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

$L_2 \ldots r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

$L_3 \ldots L_1$ *op* L_2

	a	b	c	$L_1 \cap L_2$
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	1
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	1
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	1
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	0
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	0

Task 6

L_1 … $r_1=a^*b^*c^*$

	a	b	c	
q_0	q_0	q_1	q_2	1
q_1	q_3	q_1	q_2	1
q_2	q_3	q_3	q_2	1
q_3	q_3	q_3	q_3	0

L_2 … $r_2=a^*(b+c)^*$

	a	b	c	
q_0	q_0	q_1	q_1	1
q_1	q_2	q_1	q_1	1
q_2	q_2	q_2	q_2	0

L_3 … L_1 *op* L_2

	a	b	c	$L_1 \cap L_2$	$L_1 \cup L_2$	L_1-L_2	L_2-L_1
$[q_0,q_0]$	$[q_0,q_0]$	$[q_1,q_1]$	$[q_2,q_1]$	1	1	0	0
$[q_1,q_1]$	$[q_3,q_2]$	$[q_1,q_1]$	$[q_2,q_1]$	1	1	0	0
$[q_2,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_2,q_1]$	1	1	0	0
$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	$[q_3,q_2]$	0	0	0	0
$[q_3,q_1]$	$[q_3,q_2]$	$[q_3,q_1]$	$[q_3,q_1]$	0	1	0	1

Task 7

- Write a regular expression to describe a language which contains sequences over alphabet {0, 1, 2} in which there are no consecutive repetitions of the symbol 0.

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$$(01+02+1+2)^*$$

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  1. If there is a 0 in a sub-sequence, next symbol MUST be either 1 or 2
  2. At the end of the sequence there can be ONE symbol 0 or nothing

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1. Sequence can, but it doesn't have to, start with the symbol 0

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---

1. Sequence can, but it doesn't have to, start with the symbol 0
2. Because of the possible appearance of the symbol 0 at the start of the sequence, next symbol MUST be either 1 or 2

$$(0+\varepsilon)$$

Task 7

- Write a regular expression to describe a language which contains sequences over alphabet {0, 1, 2} in which there are no consecutive repetitions of the symbol 0.

    1. If there is a 0 in a sub-sequence, next symbol MUST be either 1 or 2
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$$(01+02+1+2)^*(0+\varepsilon)$$

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1. Sequence can, but it doesn't have to, start with the symbol 0
2. Because of the possible appearance of the symbol 0 at the start of the sequence, next symbol MUST be either 1 or 2
    - In sequence concatenation there MUST NOT appear sub-sequence “00”

$$(0+\varepsilon)$$

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2. At the end of the sequence there can be ONE symbol 0 or nothing

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1. Sequence can, but it doesn't have to, start with the symbol 0
2. Because of the possible appearance of the symbol 0 at the start of the sequence, next symbol MUST be either 1 or 2
   - In sequence concatenation there MUST NOT appear sub-sequence “00”
   - Allowed combinations are: “10”, “20”, “1”, “2”

$$(0+\varepsilon)$$

Task 7

- Write a regular expression to describe a language which contains sequences over alphabet {0, 1, 2} in which there are no consecutive repetitions of the symbol 0.

1. If there is a 0 in a sub-sequence, next symbol MUST be either 1 or 2
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1. Sequence can, but it doesn't have to, start with the symbol 0
2. Because of the possible appearance of the symbol 0 at the start of the sequence, next symbol MUST be either 1 or 2
   - In sequence concatenation there MUST NOT appear sub-sequence “00”
   - Allowed combinations are: “10”, “20”, “1”, “2”

$$(0+\varepsilon)(10+20+1+2)^*$$

Task 8

- Examine if the next regular expressions are equivalent:

  a) $a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+$

  b) $a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b$

- Using algebraic laws we reduce the complex expression

Task 8

- Examine if the next regular expressions are equivalent:
  - a) $a^{*} (a^{+} + \varepsilon) a b (b^{+} + \varepsilon)^{*} = a^{+} b^{+}$
  - b) $a^{+} (a^{*} + b^{+})^{+} b^{+} = a (a + b)^{*} b$

- Using algebraic laws we reduce the complex expression

  - We get a simpler expression and confirm the equivalence

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  b) $a^{+} (a^{*} + b^{+})^{+} b^{+} = a (a + b)^{*} b$

- Using algebraic laws we reduce the complex expression

  - We get a simpler expression and confirm the equivalence

  or

Task 8

- Examine if the next regular expressions are equivalent:

  a) $a^{*} (a^{+} + \varepsilon) \, a \, b \, (b^{+} + \varepsilon)^{*} = a^{+} b^{+}$

  b) $a^{+} (a^{*} + b^{+})^{+} b^{+} = a \, (a + b)^{*} b$

- Using algebraic laws we reduce the complex expression

  - We get a simpler expression and confirm the equivalence

    or

  - We conclude that expressions are not equivalent

Task 8

a) $a^{*} (a^{+} + \varepsilon) a b (b^{+} + \varepsilon)^{*} = a^{+} b^{+}$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$

$x^+ + \varepsilon = x^*$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$$
$$= \underline{a^* a^*} a b (b^+ + \varepsilon)^*$$

$x^+ + \varepsilon = x^*$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$$

$$= \underline{a^* a^*} a b (b^+ + \varepsilon)^*$$

$$x^+ + \varepsilon = x^*$$

$$x^* x^* = x^*$$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$$
$$= \underline{a^* a^*} a b (b^+ + \varepsilon)^*$$
$$= a^* a b \underline{(b^+ + \varepsilon)}^*$$

$x^+ + \varepsilon = x^*$

$x^* x^* = x^*$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$$

$$= \underline{a^* a^*} a b (b^+ + \varepsilon)^*$$

$$= a^* a b \underline{(b^+ + \varepsilon)}^*$$

$x^+ + \varepsilon = x^*$

$x^* x^* = x^*$

$x^+ + \varepsilon = x^*$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$$
$$= \underline{a^* a^*} a b (b^+ + \varepsilon)^*$$
$$= a^* a b \underline{(b^+ + \varepsilon)^*}$$
$$= a^* a b \underline{(b^*)^*}$$

$x^+ + \varepsilon = x^*$

$x^* x^* = x^*$

$x^+ + \varepsilon = x^*$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$$
\begin{aligned}
& a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^* && x^+ + \varepsilon = x^* \\
&= \underline{a^* a^*} a b (b^+ + \varepsilon)^* && x^* x^* = x^* \\
&= a^* a b \underline{(b^+ + \varepsilon)}^* && x^+ + \varepsilon = x^* \\
&= a^* a b \underline{(b^*)}^* && (x^*)^* = x^*
\end{aligned}
$$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$$
$$= \underline{a^* a^*} a b (b^+ + \varepsilon)^*$$
$$= a^* a b \underline{(b^+ + \varepsilon)^*}$$
$$= a^* a b \underline{(b^*)^*}$$
$$= a^* a \underline{b b^*}$$

$$x^+ + \varepsilon = x^*$$
$$x^* x^* = x^*$$
$$x^+ + \varepsilon = x^*$$
$$(x^*)^* = x^*$$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$	$x^+ + \varepsilon = x^*$
$= \underline{a^* a^*} a b (b^+ + \varepsilon)^*$	$x^* x^* = x^*$
$= a^* a b \underline{(b^+ + \varepsilon)}^*$	$x^+ + \varepsilon = x^*$
$= a^* a b \underline{(b^*)^*}$	$(x^*)^* = x^*$
$= a^* a \underline{b b^*}$	$x x^* = x^+$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) \, a \, b \, (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$$a^* \underline{(a^+ + \varepsilon)} \, a \, b \, (b^+ + \varepsilon)^* \qquad\qquad x^+ + \varepsilon = x^*$$

$$= \underline{a^* a^*} \, a \, b \, (b^+ + \varepsilon)^* \qquad\qquad x^* x^* = x^*$$

$$= a^* a \, b \, \underline{(b^+ + \varepsilon)}^* \qquad\qquad x^+ + \varepsilon = x^*$$

$$= a^* a \, b \, \underline{(b^*)^*} \qquad\qquad (x^*)^* = x^*$$

$$= a^* a \, \underline{b \, b^*} \qquad\qquad x \, x^* = x^+$$

$$= \underline{a^* a} \, b^+$$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$	$x^+ + \varepsilon = x^*$
$= \underline{a^* a^*} a b (b^+ + \varepsilon)^*$	$x^* x^* = x^*$
$= a^* a b \underline{(b^+ + \varepsilon)^*}$	$x^+ + \varepsilon = x^*$
$= a^* a b \underline{(b^*)^*}$	$(x^*)^* = x^*$
$= a^* a \underline{b b^*}$	$x x^* = x^+$
$= \underline{a^* a} b^+$	$x^* x = x^+$

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$	$x^+ + \varepsilon = x^*$
$= \underline{a^* a^*} a b (b^+ + \varepsilon)^*$	$x^* x^* = x^*$
$= a^* a b \underline{(b^+ + \varepsilon)}^*$	$x^+ + \varepsilon = x^*$
$= a^* a b \underline{(b^*)^*}$	$(x^*)^* = x^*$
$= a^* a \underline{b b^*}$	$x x^* = x^+$
$= \underline{a^* a} b^+$	$x^* x = x^+$
$= a^+ b^+$	

Task 8

a) $\mathbf{a^* (a^+ + \varepsilon) a b (b^+ + \varepsilon)^* = a^+ b^+}$

Applied algebraic laws

$a^* \underline{(a^+ + \varepsilon)} a b (b^+ + \varepsilon)^*$	$x^+ + \varepsilon = x^*$
$= \underline{a^* a^*} a b (b^+ + \varepsilon)^*$	$x^* x^* = x^*$
$= a^* a b \underline{(b^+ + \varepsilon)}^*$	$x^+ + \varepsilon = x^*$
$= a^* a b \underline{(b^*)^*}$	$(x^*)^* = x^*$
$= a^* a \underline{b b^*}$	$x x^* = x^+$
$= \underline{a^* a} b^+$	$x^* x = x^+$
$= a^+ b^+$	

Task 8

b) $a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b$

Task 8

b) $a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b$

$a^+ \underline{(a^* + b^+)^+} b^+ =$

Task 8

b) $\mathbf{a^{+} (a^{*} + b^{+})^{+} b^{+} = a (a + b)^{*} b}$

Applied algebraic laws

$a^{+} \underline{(a^{*} + b^{+})^{+}} b^{+} =$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$a^+ \underline{(a^* + b^+)^+} b^+ =$

$x^+ = x x^*$

Task 8

b) $\mathbf{a^{+} (a^{*} + b^{+})^{+} b^{+} = a (a + b)^{*} b}$

Applied algebraic laws

$a^{+} \underline{(a^{*} + b^{+})^{+}} b^{+} =$

$= a^{+} (a^{*} + b^{+}) (a^{*} + \underline{b^{+}})^{*} b^{+}$

$x^{+} = x\, x^{*}$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$a^+ \underline{(a^* + b^+)^+} b^+ =$

$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$

$x^+ = x\, x^*$

$x^+ = x\, x^*$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$$a^+ \underline{(a^* + b^+)^+} b^+ =$$
$$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$$
$$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$$

$x^+ = x\, x^*$

$x^+ = x\, x^*$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$a^+ \underline{(a^* + b^+)^+} b^+ =$

$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$

$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$

$x^+ = x x^*$

$x^+ = x x^*$

$(x^* + yy^*)^* = (x + y)^*$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$a^+ \underline{(a^* + b^+)^+} b^+ =$

$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$

$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$

$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$

$x^+ = x x^*$

$x^+ = x x^*$

$(x^* + yy^*)^* = (x + y)^*$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$a^+ \underline{(a^* + b^+)^+} b^+ =$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$x^+ = x\, x^*$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$a^+ \underline{(a^* + b^+)^+} b^+ =$	
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$x^+ = x\, x^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+$	$x^+ = x\, x^*$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$a^+ \underline{(a^* + b^+)^+} b^+ =$ | $x^+ = x\,x^*$

$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$ | $x^+ = x\,x^*$

$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$ | $(x^* + yy^*)^* = (x + y)^*$

$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$ | $x^+ = x\,x^*$

$= a\ \underline{a^* (a^* + b^+)} (a + b)^* b^+$ | $x\,(y+z) = xy + xz$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$a^+ \underline{(a^* + b^+)^+} b^+ =$ | $x^+ = x\,x^*$
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$ | $x^+ = x\,x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$ | $(x^* + yy^*)^* = (x + y)^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$ | $x^+ = x\,x^*$
$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+$ | $x\,(y+z) = xy + xz$
$= a (\underline{a^* a^*} + a^* b^+) (a + b)^* b^+$

Task 8

b) $\mathbf{a^{+} (a^{*} + b^{+})^{+} b^{+} = a (a + b)^{*} b}$

Applied algebraic laws

$$a^{+} \underline{(a^{*} + b^{+})^{+}} b^{+} =$$

$$= a^{+} (a^{*} + b^{+}) (a^{*} + \underline{b^{+}})^{*} b^{+}$$

$$= a^{+} (a^{*} + b^{+}) \underline{(a^{*} + bb^{*})^{*}} b^{+}$$

$$= \underline{a^{+}} (a^{*} + b^{+}) (a + b)^{*} b^{+}$$

$$= a \, \underline{a^{*} (a^{*} + b^{+})} (a + b)^{*} b^{+}$$

$$= a (\underline{a^{*} a^{*}} + a^{*} b^{+}) (a + b)^{*} b^{+}$$

$x^{+} = x\, x^{*}$

$x^{+} = x\, x^{*}$

$(x^{*} + yy^{*})^{*} = (x + y)^{*}$

$x^{+} = x\, x^{*}$

$x\,(y+z) = xy + xz$

$x^{*} x^{*} = x^{*}$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$$a^+ \underline{(a^* + b^+)^+} b^+ =$$
$$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+ \qquad x^+ = x\,x^*$$
$$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+ \qquad x^+ = x\,x^*$$
$$= \underline{a^+} (a^* + b^+) (a + b)^* b^+ \qquad (x^* + yy^*)^* = (x + y)^*$$
$$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+ \qquad x^+ = x\,x^*$$
$$= a (\underline{a^* a^*} + a^* b^+) (a + b)^* b^+ \qquad x (y+z) = xy + xz$$
$$= a \underline{(a^* + a^* b^+)} (a + b)^* b^+ \qquad x^* x^* = x^*$$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$$a^+ \underline{(a^* + b^+)^+} b^+ =$$
$$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+ \qquad x^+ = x\, x^*$$
$$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+ \qquad x^+ = x\, x^*$$
$$= \underline{a^+} (a^* + b^+) (a + b)^* b^+ \qquad (x^* + yy^*)^* = (x + y)^*$$
$$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+ \qquad x^+ = x\, x^*$$
$$= a\, (\underline{a^* a^*} + a^* b^+) (a + b)^* b^+ \qquad x\, (y+z) = xy + xz$$
$$= a\, \underline{(a^* + a^* b^+)} (a + b)^* b^+ \qquad x^* x^* = x^*$$
$$xy + xz = x\, (y+z)$$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$$a^+ \underline{(a^* + b^+)^+} b^+ =$$

$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\,x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$x^+ = x\,x^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+$	$x^+ = x\,x^*$
$= a (\underline{a^* a^*} + a^* b^+) (a + b)^* b^+$	$x\,(y+z) = xy + xz$
$= a\, \underline{(a^* + a^* b^+)} (a + b)^* b^+$	$x^* x^* = x^*$
$= a\, a^* \underline{(\varepsilon + b^+)} (a + b)^* b^+$	$xy + xz = x\,(y+z)$

Task 8

b) $\mathbf{a^{+} (a^{*} + b^{+})^{+} b^{+} = a (a + b)^{*} b}$

$$a^{+} \underline{(a^{*} + b^{+})^{+}} b^{+} =$$
$$= a^{+} (a^{*} + b^{+}) (a^{*} + \underline{b^{+}})^{*} b^{+}$$
$$= a^{+} (a^{*} + b^{+}) \underline{(a^{*} + bb^{*})^{*}} b^{+}$$
$$= \underline{a^{+}} (a^{*} + b^{+}) (a + b)^{*} b^{+}$$
$$= a\ \underline{a^{*} (a^{*} + b^{+})} (a + b)^{*} b^{+}$$
$$= a\ (\underline{a^{*} a^{*}} + a^{*} b^{+}) (a + b)^{*} b^{+}$$
$$= a\ \underline{(a^{*} + a^{*} b^{+})} (a + b)^{*} b^{+}$$
$$= a\ a^{*} \underline{(\varepsilon + b^{+})} (a + b)^{*} b^{+}$$

Applied algebraic laws

$x^{+} = x\,x^{*}$

$x^{+} = x\,x^{*}$

$(x^{*} + yy^{*})^{*} = (x + y)^{*}$

$x^{+} = x\,x^{*}$

$x\,(y+z) = xy + xz$

$x^{*} x^{*} = x^{*}$

$xy + xz = x\,(y+z)$

$x^{+} + \varepsilon = x^{*}$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$a^+ \underline{(a^* + b^+)^+} b^+ =$	$x^+ = x\,x^*$
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\,x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$x^+ = x\,x^*$
$= a\,\underline{a^* (a^* + b^+)} (a + b)^* b^+$	$x\,(y+z) = xy + xz$
$= a\,(\underline{a^* a^*} + a^* b^+) (a + b)^* b^+$	$x^* x^* = x^*$
$= a\,\underline{(a^* + a^* b^+)} (a + b)^* b^+$	$xy + xz = x\,(y+z)$
$= a\,a^* \underline{(\varepsilon + b^+)} (a + b)^* b^+$	$x^+ + \varepsilon = x^*$
$= a\,a^* b^* (a + b)^* \underline{b^+}$	

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

	Applied algebraic laws
$a^+ \underline{(a^* + b^+)^+} b^+ =$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$x^+ = x\, x^*$
$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+$	$x\,(y+z) = xy + xz$
$= a\, (\underline{a^* a^*} + a^* b^+) (a + b)^* b^+$	$x^* x^* = x^*$
$= a\, \underline{(a^* + a^* b^+)} (a + b)^* b^+$	$xy + xz = x\,(y+z)$
$= a\, a^* \underline{(\varepsilon + b^+)} (a + b)^* b^+$	$x^+ + \varepsilon = x^*$
$= a\, a^* b^* (a + b)^* \underline{b^+}$	$x^+ = x^* x$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

	Applied algebraic laws
$a^+ \underline{(a^* + b^+)^+} b^+ =$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$x^+ = x\, x^*$
$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+$	$x\, (y+z) = xy + xz$
$= a\, (\underline{a^* a^*} + a^* b^+) (a + b)^* b^+$	$x^* x^* = x^*$
$= a\, \underline{(a^* + a^* b^+)} (a + b)^* b^+$	$xy + xz = x\, (y+z)$
$= a\, a^* \underline{(\varepsilon + b^+)} (a + b)^* b^+$	$x^+ + \varepsilon = x^*$
$= a\, a^* b^* (a + b)^* \underline{b^+}$	$x^+ = x^* x$
$= a\, a^* \underline{b^* (a + b)^*} b^* b$	

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

Applied algebraic laws

$a^+ \underline{(a^* + b^+)^+} b^+ =$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$x^+ = x\, x^*$
$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+$	$x\,(y+z) = xy + xz$
$= a\, (\underline{a^*\, a^*} + a^*\, b^+) (a + b)^* b^+$	$x^* x^* = x^*$
$= a\, \underline{(a^* + a^*\, b^+)} (a + b)^* b^+$	$xy + xz = x\,(y+z)$
$= a\, a^* \underline{(\varepsilon + b^+)} (a + b)^* b^+$	$x^+ + \varepsilon = x^*$
$= a\, a^*\, b^* (a + b)^* \underline{b^+}$	$x^+ = x^* x$
$= a\, a^*\, \underline{b^* (a + b)^*} b^*\, b$	$y^* (x + y)^* = (x + y)^*$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

	Applied algebraic laws
$a^+ \underline{(a^* + b^+)^+} b^+ =$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$x^+ = x\, x^*$
$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+$	$x\, (y+z) = xy + xz$
$= a\, (\underline{a^* a^*} + a^* b^+) (a + b)^* b^+$	$x^* x^* = x^*$
$= a\, \underline{(a^* + a^* b^+)} (a + b)^* b^+$	$xy + xz = x\, (y+z)$
$= a\, a^* \underline{(\varepsilon + b^+)} (a + b)^* b^+$	$x^+ + \varepsilon = x^*$
$= a\, a^* b^* (a + b)^* \underline{b^+}$	$x^+ = x^* x$
$= a\, a^* \underline{b^* (a + b)^*} b^* b$	$y^* (x + y)^* = (x + y)^*$
$= a\, \underline{a^* (a + b)^*} b^* b$	

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

	Applied algebraic laws
$a^+ \underline{(a^* + b^+)^+} b^+ =$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\, x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$x^+ = x\, x^*$
$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+$	$x\, (y+z) = xy + xz$
$= a\, (\underline{a^* a^*} + a^* b^+) (a + b)^* b^+$	$x^* x^* = x^*$
$= a\, \underline{(a^* + a^* b^+)} (a + b)^* b^+$	$xy + xz = x\, (y+z)$
$= a\, a^* \underline{(\varepsilon + b^+)} (a + b)^* b^+$	$x^+ + \varepsilon = x^*$
$= a\, a^* b^* (a + b)^* \underline{b^+}$	$x^+ = x^* x$
$= a\, a^* \underline{b^* (a + b)^*} b^* b$	$y^* (x + y)^* = (x + y)^*$
$= a\, \underline{a^* (a + b)^*} b^* b$	$x^* (x + y)^* = (x + y)^*$

Task 8

b) $\mathbf{a^{+} (a^{*} + b^{+})^{+} b^{+} = a (a + b)^{*} b}$

$$
\begin{aligned}
& a^{+} \underline{(a^{*} + b^{+})^{+}} b^{+} = \\
& \quad = a^{+} (a^{*} + b^{+}) (a^{*} + \underline{b^{+}})^{*} b^{+} \\
& \quad = a^{+} (a^{*} + b^{+}) \underline{(a^{*} + bb^{*})^{*}} b^{+} \\
& \quad = \underline{a^{+}} (a^{*} + b^{+}) (a + b)^{*} b^{+} \\
& \quad = a\ \underline{a^{*} (a^{*} + b^{+})} (a + b)^{*} b^{+} \\
& \quad = a (\underline{a^{*} a^{*}} + a^{*} b^{+}) (a + b)^{*} b^{+} \\
& \quad = a\ \underline{(a^{*} + a^{*} b^{+})} (a + b)^{*} b^{+} \\
& \quad = a\ a^{*} \underline{(\varepsilon + b^{+})} (a + b)^{*} b^{+} \\
& \quad = a\ a^{*} b^{*} (a + b)^{*} \underline{b^{+}} \\
& \quad = a\ a^{*} \underline{b^{*} (a + b)^{*}} b^{*} b \\
& \quad = a\ \underline{a^{*} (a + b)^{*}} b^{*} b \\
& \quad = a\ \underline{(a + b)^{*} b^{*}} b
\end{aligned}
$$

Applied algebraic laws

$$
\begin{aligned}
& x^{+} = x\, x^{*} \\
& x^{+} = x\, x^{*} \\
& (x^{*} + yy^{*})^{*} = (x + y)^{*} \\
& x^{+} = x\, x^{*} \\
& x\, (y+z) = xy + xz \\
& x^{*} x^{*} = x^{*} \\
& xy + xz = x\, (y+z) \\
& x^{+} + \varepsilon = x^{*} \\
& x^{+} = x^{*} x \\
& y^{*} (x + y)^{*} = (x + y)^{*} \\
& x^{*} (x + y)^{*} = (x + y)^{*}
\end{aligned}
$$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

	Applied algebraic laws
$a^+ \underline{(a^* + b^+)^+} b^+ =$	$x^+ = x\,x^*$
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\,x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$x^+ = x\,x^*$
$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+$	$x\,(y+z) = xy + xz$
$= a\, (\underline{a^* a^*} + a^* b^+) (a + b)^* b^+$	$x^* x^* = x^*$
$= a\, \underline{(a^* + a^* b^+)} (a + b)^* b^+$	$xy + xz = x\,(y+z)$
$= a\, a^* \underline{(\varepsilon + b^+)} (a + b)^* b^+$	$x^+ + \varepsilon = x^*$
$= a\, a^* b^* (a + b)^* \underline{b^+}$	$x^+ = x^* x$
$= a\, a^* \underline{b^* (a + b)^*} b^* b$	$y^* (x + y)^* = (x + y)^*$
$= a\, \underline{a^* (a + b)^*} b^* b$	$x^* (x + y)^* = (x + y)^*$
$= a\, \underline{(a + b)^* b^*} b$	$(x + y)^* y^* = (x + y)^*$

Task 8

b) $\mathbf{a^{+} (a^{*} + b^{+})^{+} b^{+} = a (a + b)^{*} b}$

$$
\begin{aligned}
& a^{+} \underline{(a^{*} + b^{+})^{+}} b^{+} = \\
& \quad = a^{+} (a^{*} + b^{+}) (a^{*} + \underline{b^{+}})^{*} b^{+} \\
& \quad = a^{+} (a^{*} + b^{+}) \underline{(a^{*} + bb^{*})^{*}} b^{+} \\
& \quad = \underline{a^{+}} (a^{*} + b^{+}) (a + b)^{*} b^{+} \\
& \quad = a \, \underline{a^{*} (a^{*} + b^{+})} (a + b)^{*} b^{+} \\
& \quad = a (\underline{a^{*} a^{*}} + a^{*} b^{+}) (a + b)^{*} b^{+} \\
& \quad = a \, \underline{(a^{*} + a^{*} b^{+})} (a + b)^{*} b^{+} \\
& \quad = a \, a^{*} \underline{(\varepsilon + b^{+})} (a + b)^{*} b^{+} \\
& \quad = a \, a^{*} b^{*} (a + b)^{*} \underline{b^{+}} \\
& \quad = a \, a^{*} \underline{b^{*} (a + b)^{*}} b^{*} b \\
& \quad = a \, \underline{a^{*} (a + b)^{*}} b^{*} b \\
& \quad = a \, \underline{(a + b)^{*} b^{*}} b \\
& \quad = a (a + b)^{*} b
\end{aligned}
$$

Applied algebraic laws

$$
\begin{aligned}
& x^{+} = x \, x^{*} \\
& x^{+} = x \, x^{*} \\
& (x^{*} + yy^{*})^{*} = (x + y)^{*} \\
& x^{+} = x \, x^{*} \\
& x \, (y+z) = xy + xz \\
& x^{*} x^{*} = x^{*} \\
& xy + xz = x \, (y+z) \\
& x^{+} + \varepsilon = x^{*} \\
& x^{+} = x^{*} x \\
& y^{*} (x + y)^{*} = (x + y)^{*} \\
& x^{*} (x + y)^{*} = (x + y)^{*} \\
& (x + y)^{*} y^{*} = (x + y)^{*}
\end{aligned}
$$

Task 8

b) $\mathbf{a^+ (a^* + b^+)^+ b^+ = a (a + b)^* b}$

	Applied algebraic laws
$a^+ \underline{(a^* + b^+)^+} b^+ =$	$x^+ = x\,x^*$
$= a^+ (a^* + b^+) (a^* + \underline{b^+})^* b^+$	$x^+ = x\,x^*$
$= a^+ (a^* + b^+) \underline{(a^* + bb^*)^*} b^+$	$(x^* + yy^*)^* = (x + y)^*$
$= \underline{a^+} (a^* + b^+) (a + b)^* b^+$	$x^+ = x\,x^*$
$= a\, \underline{a^* (a^* + b^+)} (a + b)^* b^+$	$x\,(y+z) = xy + xz$
$= a\, (\underline{a^* a^*} + a^* b^+) (a + b)^* b^+$	$x^* x^* = x^*$
$= a\, \underline{(a^* + a^* b^+)} (a + b)^* b^+$	$xy + xz = x\,(y+z)$
$= a\, a^* \underline{(\varepsilon + b^+)} (a + b)^* b^+$	$x^+ + \varepsilon = x^*$
$= a\, a^* b^* (a + b)^* \underline{b^+}$	$x^+ = x^* x$
$= a\, a^* \underline{b^* (a + b)^*} b^* b$	$y^* (x + y)^* = (x + y)^*$
$= a\, \underline{a^* (a + b)^*} b^* b$	$x^* (x + y)^* = (x + y)^*$
$= a\, \underline{(a + b)^* b^*} b$	$(x + y)^* y^* = (x + y)^*$
$= a\, (a + b)^* b$	

Task 9

- Construct Moore machine that outputs remainder of division of octal number by number 5

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  - Machine has 5 states that represent current remainders of division by 5

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q_0						
q_1						
q_2						
q_3						
q_4						

Task 9

- Construct Moore machine that outputs remainder of division of octal number by number 5
  - Machine has 5 states that represent current remainders of division by 5
    - $\lambda(q_x) = x$

q_0						
q_1						
q_2						
q_3						
q_4						

Task 9

- Construct Moore machine that outputs remainder of division of octal number by number 5
  - Machine has 5 states that represent current remainders of division by 5
    - $\lambda(q_x) = x$

						λ
q_0						0
q_1						1
q_2						2
q_3						3
q_4						4

Task 9

- Construct Moore machine that outputs remainder of division of octal number by number 5
  - Machine has 5 states that represent current remainders of division by 5
    - $\lambda(q_x) = x$
  - Input symbols are grouped by congruence with 5

						λ
q_0						0
q_1						1
q_2						2
q_3						3
q_4						4

Task 9

- Construct Moore machine that outputs remainder of division of octal number by number 5
  - Machine has 5 states that represent current remainders of division by 5
    - $\lambda(q_x) = x$
  - Input symbols are grouped by congruence with 5

	0,5	1,6	2,7	3	4	λ
q_0						0
q_1						1
q_2						2
q_3						3
q_4						4

Task 9

- Construct Moore machine that outputs remainder of division of octal number by number 5
  - Machine has 5 states that represent current remainders of division by 5
    - $\lambda(q_x) = x$
  - Input symbols are grouped by congruence with 5
  - We calculate the transifiton function according to formula:

	0,5	1,6	2,7	3	4	λ
q_0						0
q_1						1
q_2						2
q_3						3
q_4						4

Task 9

- Construct Moore machine that outputs remainder of division of octal number by number 5
  - Machine has 5 states that represent current remainders of division by 5
    - $\lambda(q_x) = x$
  - Input symbols are grouped by congruence with 5
  - We calculate the transifiton function according to formula:
    - $remainder_{n+1}=(remainder_n*base+digit_{n+1})\%divisor$

	0,5	1,6	2,7	3	4	λ
q_0						0
q_1						1
q_2						2
q_3						3
q_4						4

Task 9

- Construct Moore machine that outputs remainder of division of octal number by number 5
  - Machine has 5 states that represent current remainders of division by 5
    - $\lambda(q_x) = x$
  - Input symbols are grouped by congruence with 5
  - We calculate the transifiton function according to formula:
    - $remainder_{n+1}=(remainder_n*base+digit_{n+1})\%divisor$
    - $\delta(q_x, a) = q_{(x*8 + a)\%5}$

	0,5	1,6	2,7	3	4	λ
q_0						0
q_1						1
q_2						2
q_3						3
q_4						4

Task 9

- Construct Moore machine that outputs remainder of division of octal number by number 5

  - Machine has 5 states that represent current remainders of division by 5
    - $\lambda(q_x) = x$
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	0,5	1,6	2,7	3	4	λ
q_0						0
q_1						1
q_2						2
q_3						3
q_4						4

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	0,5	1,6	2,7	3	4	λ
q_0	q_0					0
q_1						1
q_2						2
q_3						3
q_4						4

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    - $\delta(q_x, a) = q_{(x*8 + a)\%5}$

	0,5	1,6	2,7	3	4	λ
q_0	q_0					0
q_1						1
q_2						2
q_3						3
q_4						4

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    - $\delta(q_x, a) = q_{(x*8 + a)\%5}$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1						1
q_2						2
q_3						3
q_4						4

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    - $\delta(q_x, a) = q_{(x*8 + a)\%5}$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

Task 10

- From the given Moore machine construct Mealy machine.

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

- Convert Moore $\rightarrow$ Mealy
  - $\delta_2(q,a) = \delta_1(q,a)$

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

- Convert Moore $\rightarrow$ Mealy
  - $\delta_2(q,a) = \delta_1(q,a)$

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

- Convert Moore $\rightarrow$ Mealy
  - $\delta_2(q,a) = \delta_1(q,a)$
  - $\lambda_2(q,a) = \lambda_1(\delta_1(q,a))$

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

- Convert Moore → Mealy
  - $\delta_2(q,a) = \delta_1(q,a)$
  - $\lambda_2(q,a) = \lambda_1(\delta_1(q,a))$

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

λ_2	0,5	1,6	2,7	3	4
q_0					
q_1					
q_2					
q_3					
q_4					

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

- Convert Moore → Mealy
  - $\delta_2(q,a) = \delta_1(q,a)$
  - $\lambda_2(q,a) = \lambda_1(\delta_1(q,a))$

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

λ_2	0,5	1,6	2,7	3	4
q_0					
q_1					
q_2					
q_3					
q_4					

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

- Convert Moore → Mealy
  - $\delta_2(q,a) = \delta_1(q,a)$
  - $\lambda_2(q,a) = \lambda_1(\delta_1(q,a))$

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

λ_2	0,5	1,6	2,7	3	4
q_0					
q_1					
q_2					
q_3					
q_4					

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

- Convert Moore → Mealy
  - $\delta_2(q,a) = \delta_1(q,a)$
  - $\lambda_2(q,a) = \lambda_1(\delta_1(q,a))$

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

λ_2	0,5	1,6	2,7	3	4
q_0					
q_1					
q_2					
q_3					
q_4					

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

- Convert Moore → Mealy
  - $\delta_2(q,a) = \delta_1(q,a)$
  - $\lambda_2(q,a) = \lambda_1(\delta_1(q,a))$

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δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

λ_2	0,5	1,6	2,7	3	4
q_0					
q_1					
q_2					
q_3					
q_4					

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Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

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δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

λ_2	0,5	1,6	2,7	3	4
q_0					
q_1					
q_2					
q_3					
q_4					

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	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

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  - $\lambda_2(q,a) = \lambda_1(\delta_1(q,a))$

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δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

λ_2	0,5	1,6	2,7	3	4
q_0	0				
q_1					
q_2					
q_3					
q_4					

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

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  - $\delta_2(q,a) = \delta_1(q,a)$
  - $\lambda_2(q,a) = \lambda_1(\delta_1(q,a))$

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

λ_2	0,5	1,6	2,7	3	4
q_0	0				
q_1					
q_2					
q_3					
q_4					

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

- Convert Moore → Mealy
  - $\delta_2(q,a) = \delta_1(q,a)$
  - $\lambda_2(q,a) = \lambda_1(\delta_1(q,a))$

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

λ_2	0,5	1,6	2,7	3	4
q_0	0	1	2	3	4
q_1					
q_2					
q_3					
q_4					

Task 10

Moore $M_1 = (Q, \Sigma, \Delta, \delta_1, \lambda_1, q_0)$

	0,5	1,6	2,7	3	4	λ
q_0	q_0	q_1	q_2	q_3	q_4	0
q_1	q_3	q_4	q_0	q_1	q_2	1
q_2	q_1	q_2	q_3	q_4	q_0	2
q_3	q_4	q_0	q_1	q_2	q_3	3
q_4	q_2	q_3	q_4	q_0	q_1	4

- Convert Moore $\rightarrow$ Mealy
  - $\delta_2(q,a) = \delta_1(q,a)$
  - $\lambda_2(q,a) = \lambda_1(\delta_1(q,a))$

Mealy $M_2 = (Q, \Sigma, \Delta, \delta_2, \lambda_2, q_0)$

δ_2	0,5	1,6	2,7	3	4
q_0	q_0	q_1	q_2	q_3	q_4
q_1	q_3	q_4	q_0	q_1	q_2
q_2	q_1	q_2	q_3	q_4	q_0
q_3	q_4	q_0	q_1	q_2	q_3
q_4	q_2	q_3	q_4	q_0	q_1

λ_2	0,5	1,6	2,7	3	4
q_0	0	1	2	3	4
q_1	3	4	0	1	2
q_2	1	2	3	4	0
q_3	4	0	1	2	3
q_4	2	3	4	0	1

Task 11

- From given Mealy machine construct Moore machine.

δ	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

- Convert Mealy $\rightarrow$ Moore

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	

Task 11

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$			

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$			

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

- Convert Mealy → Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$			

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$			

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

- Convert Mealy → Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$			

Task 11

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$		

Task 11

- Convert Mealy → Moore
  - q_{02}=[q_{01},0]
  - δ_2([q,a],b)=[δ_1(q,b), λ_1(q,b)]

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
[q_0,0]	[q_0,0]		

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$		

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

- Convert Mealy → Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$		

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

- Convert Mealy $\to$ Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

- Convert Mealy → Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	

Task 11

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	
$[q_3,0]$			

Task 11

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	
$[q_3,0]$			

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

- Convert Mealy $\rightarrow$ Moore
    - $q_{02}=[q_{01},0]$
    - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	
$[q_3,0]$	$[q_2,1]$	$[q_0,0]$	

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	
$[q_3,0]$	$[q_2,1]$	$[q_0,0]$	
$[q_2,1]$			

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

- Convert Mealy → Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	
$[q_3,0]$	$[q_2,1]$	$[q_0,0]$	
$[q_2,1]$	$[q_2,1]$	$[q_1,1]$	

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

- Convert Mealy → Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	
$[q_3,0]$	$[q_2,1]$	$[q_0,0]$	
$[q_2,1]$	$[q_2,1]$	$[q_1,1]$	
$[q_1,1]$	$[q_1,0]$	$[q_3,1]$	
$[q_1,0]$	$[q_1,0]$	$[q_3,1]$	
$[q_3,1]$	$[q_2,1]$	$[q_0,0]$	

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

- Convert Mealy → Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$
  - $\lambda_2([q,a]) = a$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	
$[q_3,0]$	$[q_2,1]$	$[q_0,0]$	
$[q_2,1]$	$[q_2,1]$	$[q_1,1]$	
$[q_1,1]$	$[q_1,0]$	$[q_3,1]$	
$[q_1,0]$	$[q_1,0]$	$[q_3,1]$	
$[q_3,1]$	$[q_2,1]$	$[q_0,0]$	

Task 11

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

- Convert Mealy $\rightarrow$ Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$
  - $\lambda_2([q,a]) = a$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	λ_2
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	
$[q_3,0]$	$[q_2,1]$	$[q_0,0]$	
$[q_2,1]$	$[q_2,1]$	$[q_1,1]$	
$[q_1,1]$	$[q_1,0]$	$[q_3,1]$	
$[q_1,0]$	$[q_1,0]$	$[q_3,1]$	
$[q_3,1]$	$[q_2,1]$	$[q_0,0]$	

Task 11

- Convert Mealy → Moore
  - $q_{02}=[q_{01},0]$
  - $\delta_2([q,a],b)=[\delta_1(q,b), \lambda_1(q,b)]$
  - $\lambda_2([q,a]) = a$

Mealy $M_1 = (Q_1, \Sigma, \Delta, \delta_1, \lambda_1, q_{01})$

δ_1	0	1
q_0	q_0	q_3
q_1	q_1	q_3
q_2	q_2	q_1
q_3	q_2	q_0

λ_1	0	1
q_0	0	0
q_1	0	1
q_2	1	1
q_3	1	0

Moore $M_2 = (Q_2, \Sigma, \Delta, \delta_2, \lambda_2, q_{02})$

δ_2	0	1	λ_2
$[q_0,0]$	$[q_0,0]$	$[q_3,0]$	0
$[q_3,0]$	$[q_2,1]$	$[q_0,0]$	0
$[q_2,1]$	$[q_2,1]$	$[q_1,1]$	1
$[q_1,1]$	$[q_1,0]$	$[q_3,1]$	1
$[q_1,0]$	$[q_1,0]$	$[q_3,1]$	0
$[q_3,1]$	$[q_2,1]$	$[q_0,0]$	1