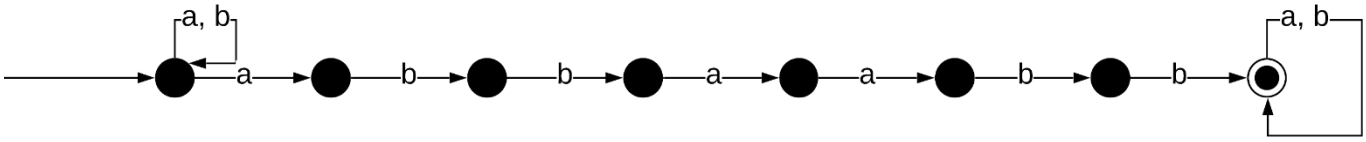
Khuyen Le Thi Minh – s5128

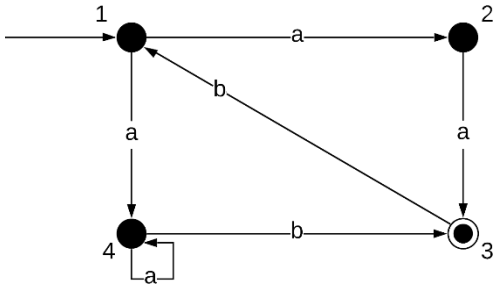
Homework 05

1. *Give a non – deterinistic automaton accepting words over alphabet $\{a.b\}$, containing a subword 'abbaabb'*



2. *Determinise the following non – deterministic automaton*
(ommit the non – reachable states, if they appear in the construction).

	a	b
$\rightarrow 1$	2,4	–
2	3	–
$F3$	–	1
4	4	3



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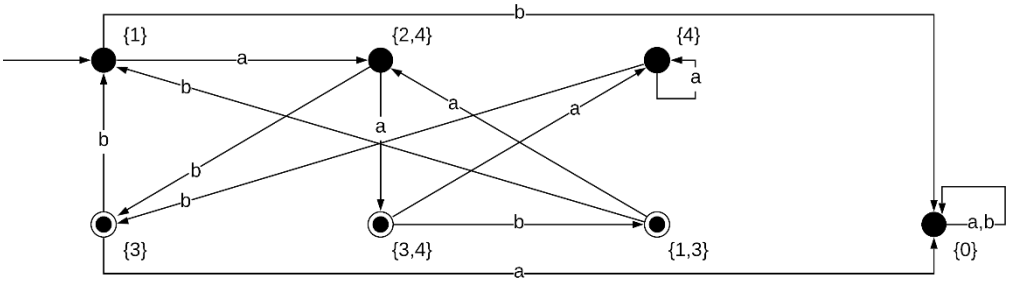
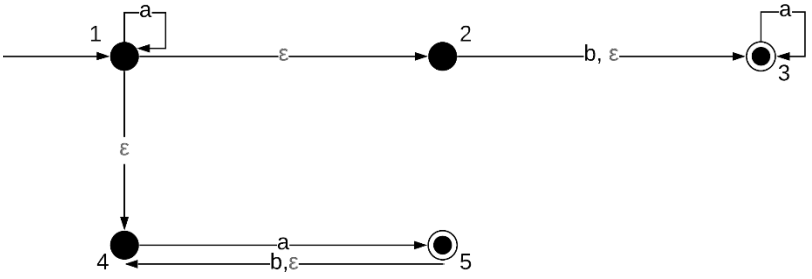
	a	b
$\rightarrow \{1\}$	$\{2,4\}$	$\{0\}$
$\{2,4\}$	$\{3,4\}$	$\{3\}$
$F\{3\}$	$\{0\}$	$\{1\}$
$F\{3,4\}$	$\{4\}$	$\{1,3\}$
$F\{1,3\}$	$\{2,4\}$	$\{1\}$
$\{4\}$	$\{4\}$	$\{3\}$
$\{0\}$	$\{0\}$	$\{0\}$



3. *Eliminate ε – transitions in the following automation*

	a	b	ε
$\rightarrow$ 1	1	–	2,4
2	–	3	3
3	3	–	–
4	5	–	–
5	–	4	4



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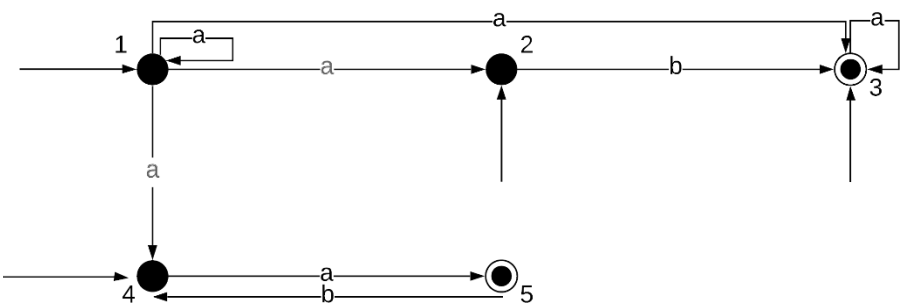
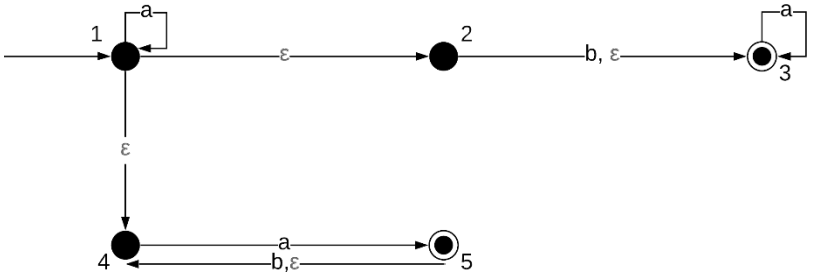
	a	b
$\rightarrow$ 1	1,2,3,4	–
$\rightarrow$ 2	–	3
$\rightarrow$ 3	3	–
$\rightarrow$ 4	5	–
5	–	4

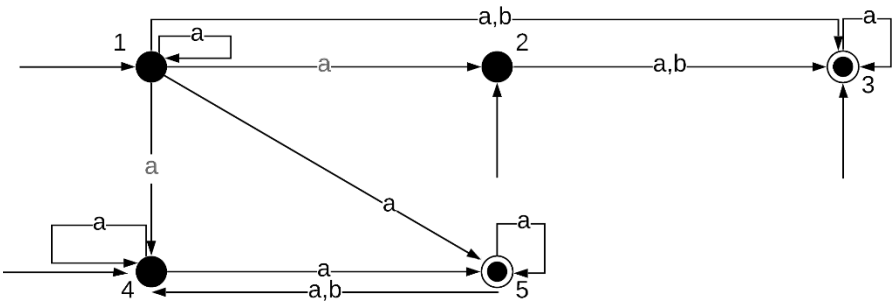


I'vesearched on the internet of the way how to remove ε – transitions and there is another way, in here it stated that every state on epsilon going to itself.

	a	b	ε
→ 1	1	–	2,4
2	–	3	3
3	3	–	–
4	5	–	–
5	–	4	4



	a	b
→ 1	1,2,3,4,5	3
2	3	3
3	3	–
4	4,5	–
5	4,5	4



sketch

	ε^*	a	ε^*
1	1	1	1,2,3,4
	2	–	–
	3	3	3
	4	5	4,5
2	2	–	–
	3	3	3
3	3	3	3
4	4	5	4,5
5	4	5	4,5
	5	–	–

	ε^*	b	ε^*
1	1	–	–
	2	3	3
	3	–	–
	4	–	–
2	2	3	3
	3	–	–
3	3	–	–
4	4	–	–
5	4	–	–
	5	4	4