ELAC Assignment 1

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Task:

$ab^*(ab|\varepsilon)^*b$

Find:

a) Three accepted strings

b) Find NFA

c) NFA-ε → DFA conversion

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a) The Three strings are:

1) ababb
2) aabb
3) ab

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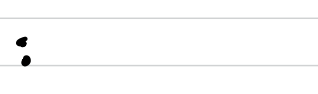
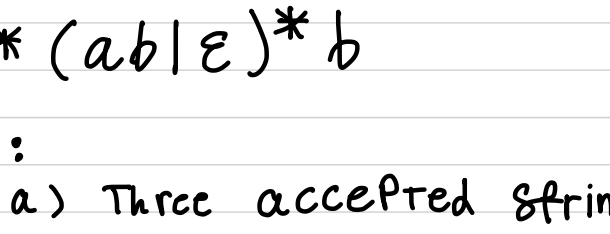
b) Thompson Algorithm NFA

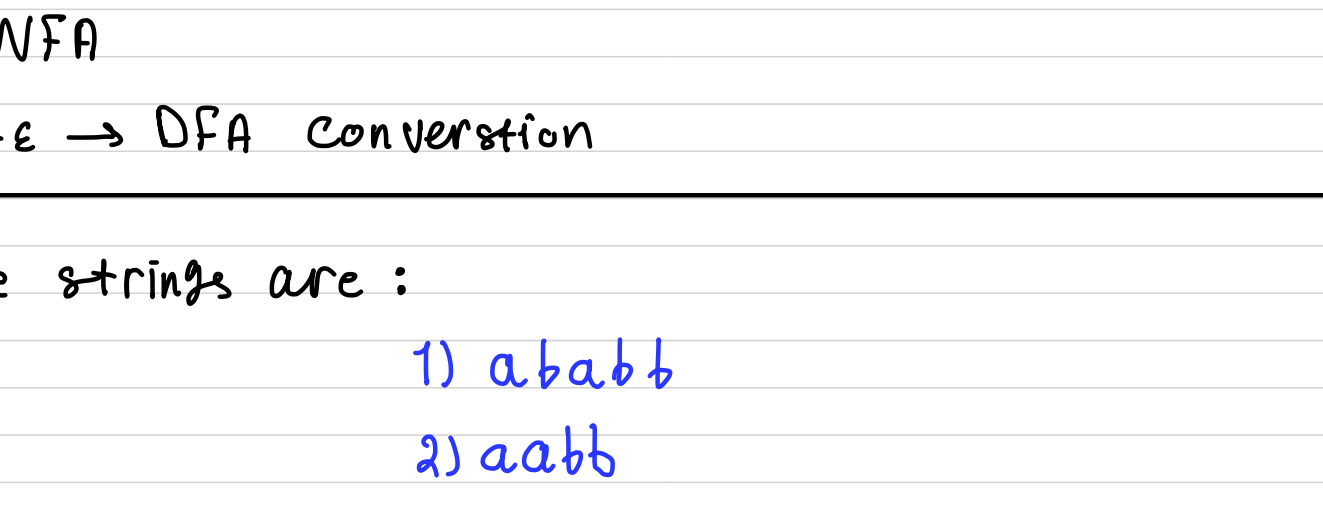
a:



b^*:

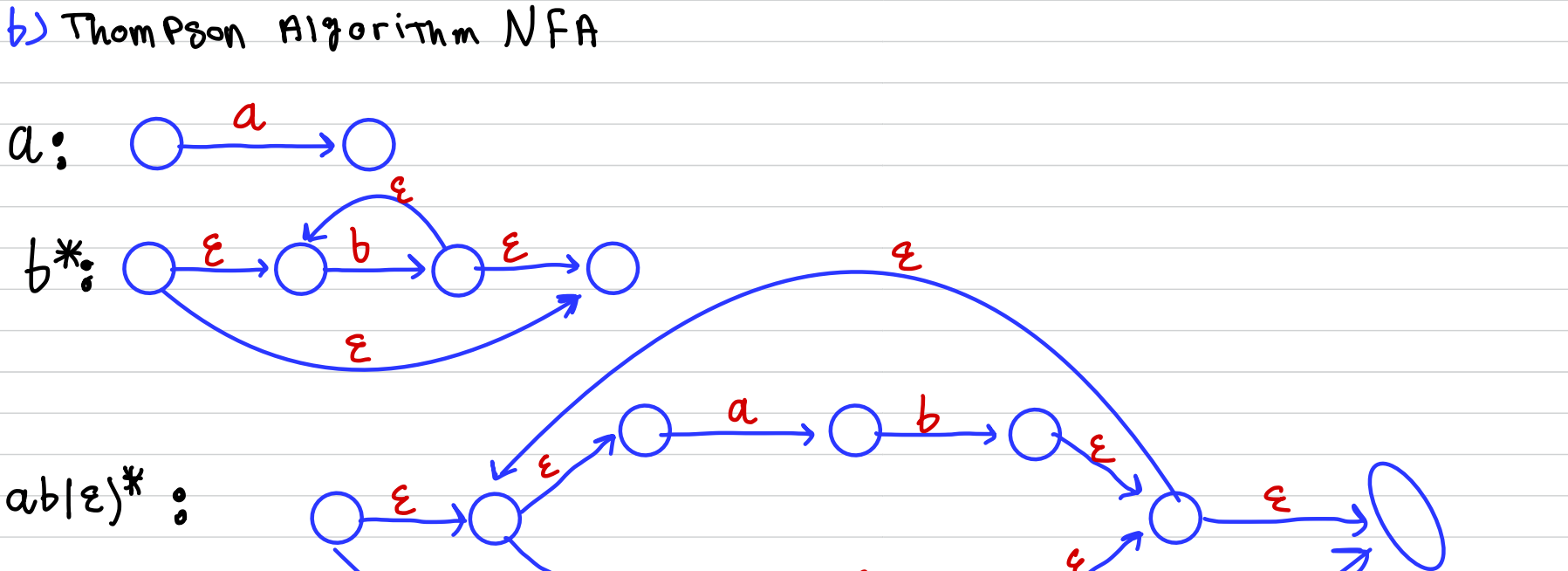


$(ab|\varepsilon)^*$:



b:

so $ab^*(ab|\varepsilon)^*b$:



C) NFA To DFA

1) $\varepsilon\text{-cl}(q_0) = \{q_0\}$ State A

move[A, a] = $\{q_1\}$

move[A, b] = $\emptyset$

2) $\varepsilon\text{-cl}(q_1) = \{q_1, q_2, q_4, q_5, q_6, q_9, q_{10}, q_{11}, q_{12}\}$ State B

move[B, a] = $\{q_7\}$

move[B, b] = $\{q_3, q_{13}\}$

3) $\varepsilon\text{-cl}(q_7) = \{q_7\}$ State C

4) $\varepsilon\text{-cl}(q_3, q_{13}) = \{q_2, q_4, q_5, q_6, q_9, q_{10}, q_{11}, q_{12}, q_3, q_{13}\}$ State D *

move[C, a] = $\emptyset$

move[C, b] = $\{q_8\}$

move[D, a] = $\{q_7\}$ C

move[D, b] = $\{q_3, q_{13}\}$ D

5) $\varepsilon\text{-cl}(q_8) = \{q_5, q_6, q_8, q_9, q_{10}, q_{11}, q_{12}\}$ State E

move[E, a] = $\{q_7\}$ C

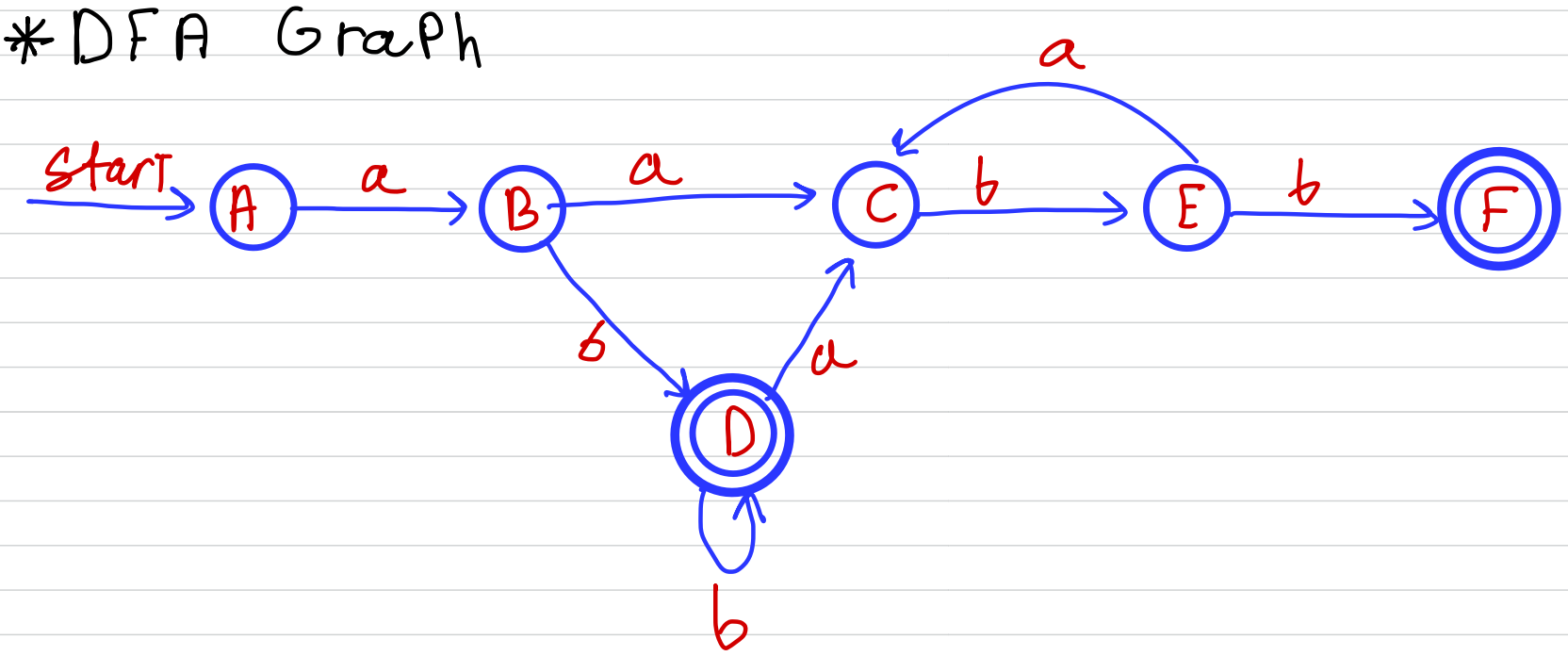
move[E, b] = $\{q_{13}\}$ f

6) $\varepsilon\text{-cl}(q_{13}) = \{q_{13}\}$ State f *

move[F, a] = $\emptyset$

move[F, b] = $\emptyset$

* DFA Graph



* Transition Table

		a	b
→	A	B	∅
	B	C	D
	C	∅	E
*	D	C	D
	E	C	F
*	f	∅	∅

A - start state

D, F - final states