$$\mathcal{L}((a \cup ba)^* bb) =$$
$$\{a, ba\}^* \{bb\}$$

$$= \{e, a, ba, aa, aba, baba, baa, aaa, \dots\}$$
$$\cdot \{bb\}$$

$$= \{bb, abb, babb, aabb, ababb, baabb,$$
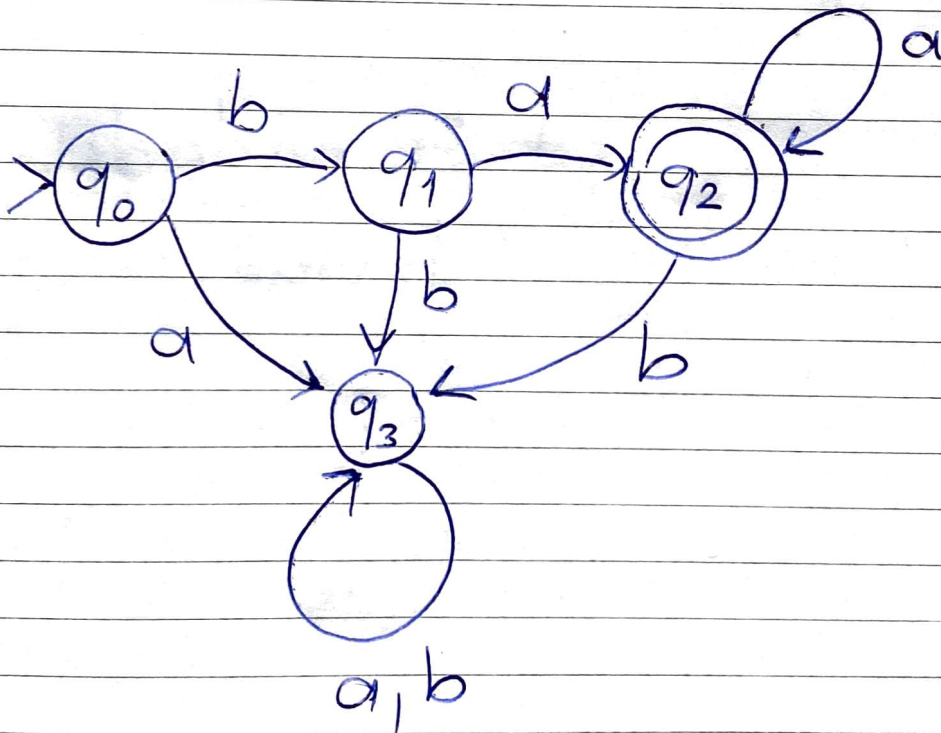$$bababb, aaabb, \dots\}$$

Sheep Language

$L = \{ba, baa, baaa, \dots \}$ $\Sigma = \{a, b\}$

In Turkish: $\{me, mee, meee, \dots \}$:)

Regular Expression for L: $ba^* \quad X$

wrong → $(ba)^* \quad X$

Correct: $baa^* \quad \checkmark$
ba^+

DFA for L:

start state: q_0

final state: q_2

q_3 is trap state

2.b)

$$((bb)^* \cup (ab)^*)^* (aa)((ba) \cup (bb))^*$$

L: Even length strings that contain aa only once.

$$\left.\begin{array}{l} bb \, ab \, \underline{aa} \checkmark \\ \underline{aa} \, bb \, ab \\ b\underline{aa} \, bb \, \underline{aa} \end{array}\right\} \begin{array}{l} \text{cannot be generated.} \\ \text{they are in } L. \end{array}$$

Correction:

Try:

$$((ab) \cup (ba)^* (bb))^* (aa)((ba) \cup (bb)(ab)^*)^*$$
$$\cup \; baab$$

But cannot generate $abaaba$

Try:

$$((ab)^* \cup (bb)^*)^* baab((ba)^* \cup (bb)^*)^*$$

Is it correct? Still No !

$\Sigma = \{a\}$
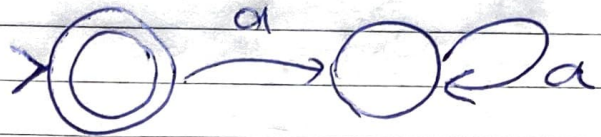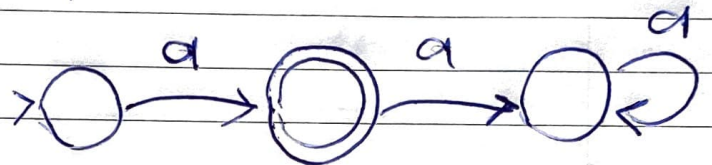
Language	DFA
ϕ	Any DFA with $F = \phi$ or with unreachable final states

$L = \{e\}$

$e \in L$ iff $s \in F$ (for DFA)

$L = \{a\}$

$L = \{a\}^*$

$\Sigma = \{a, b\}$ DFA

$L = \{a\}$

$L = \{a\}^*$
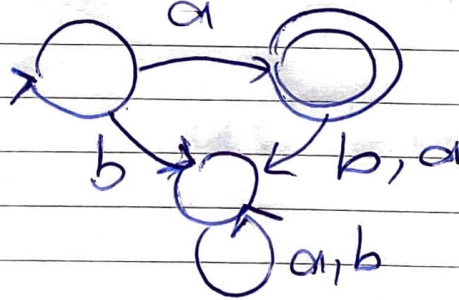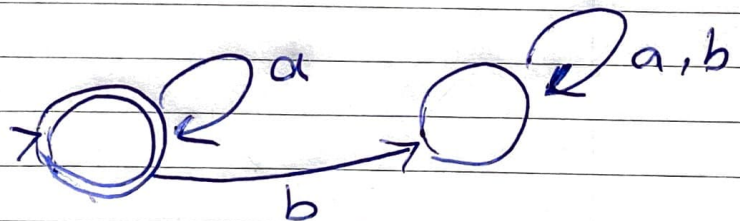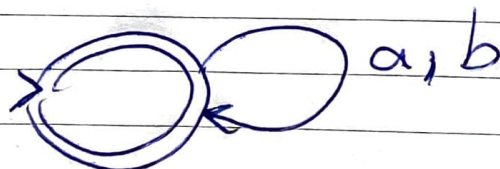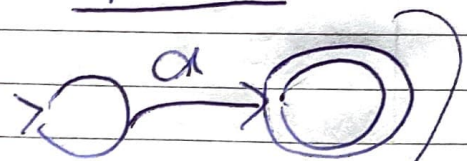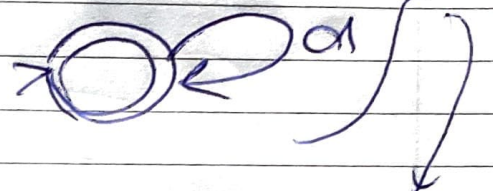

$L = \{a, b\}^*$

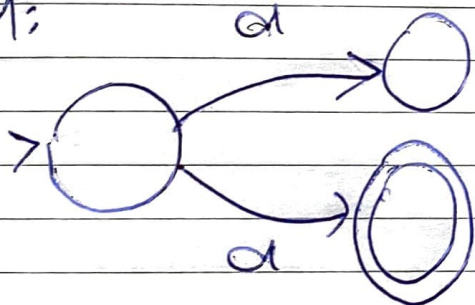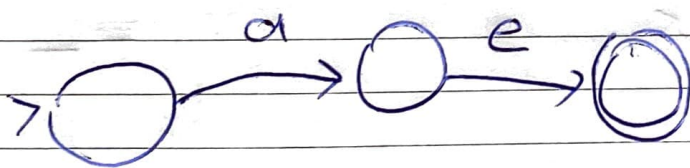$$\Sigma = \{a, b\}$$

$$L = \{a\}$$

$$L = \{a\}^*$$

transitions
for inp: symbol
b: not defined

NFA examples:

M:

$a \in L(M)$
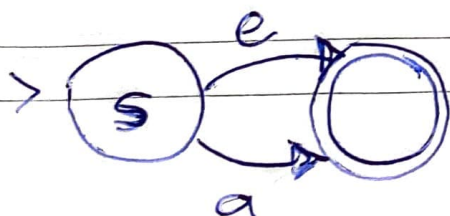

$a \in L(M)$

$a \in L(M)$
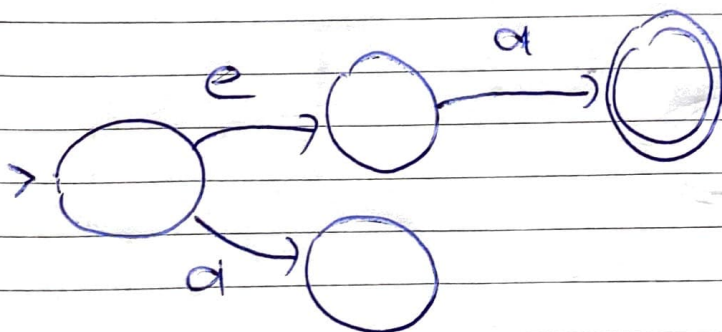
$e \in L(M)$ (Note that)
$a \in L(M)$ ($s \notin F$)

$$\Sigma = \{a, b, c\}$$

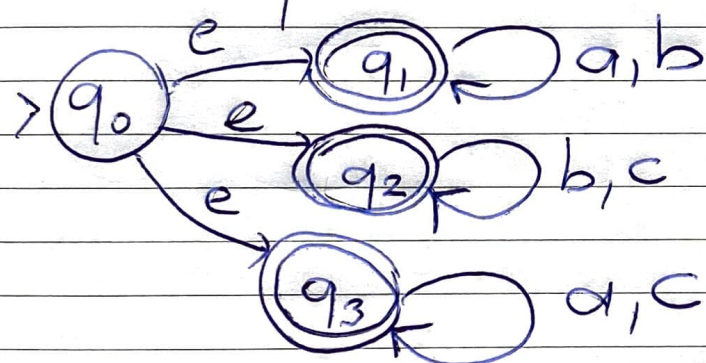$$L = \{w \in \Sigma^* \mid \text{Exactly 1 alphabet symbol is missing in } w\}$$

ex:

$abb \in L$
$bbc \in L$
$ac \in L$

$abc \notin L$

NFA for L:

$(q_0, ab) \vdash_M (q_1, \underline{ab}) \vdash_M (q_1, b) \vdash_M (q_1, e)$ <u>accepted</u>

or

$\vdash_M (q_2, \underline{ab}) \vdash_M$ no next configuration

or

$\vdash_M (q_3, ab) \vdash_M (q_3, b) \vdash$ no next configuration
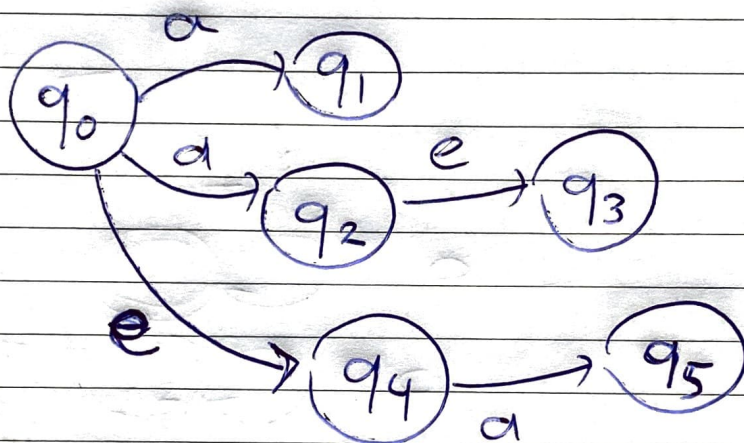
$$M \qquad M'$$

NFA to DFA construction:

Eliminate sources of nondeterminism:

1. Eliminate empty transitions

2. Add missing transitions
   (undefined)

3.

From q_0 by consuming a
next state can be q_1, q_2, q_3, q_4, q_5

Subset Construction $\qquad K' = 2^K$