

Strings
Language

Some basic [Set Theory]

FA or FSA



DFA

$M = (Q, \Sigma, \delta, q_0, F)$



DFA



Transition Table

Set Builder form



DFA

Non-deterministic Finite Automata

Non-determinism



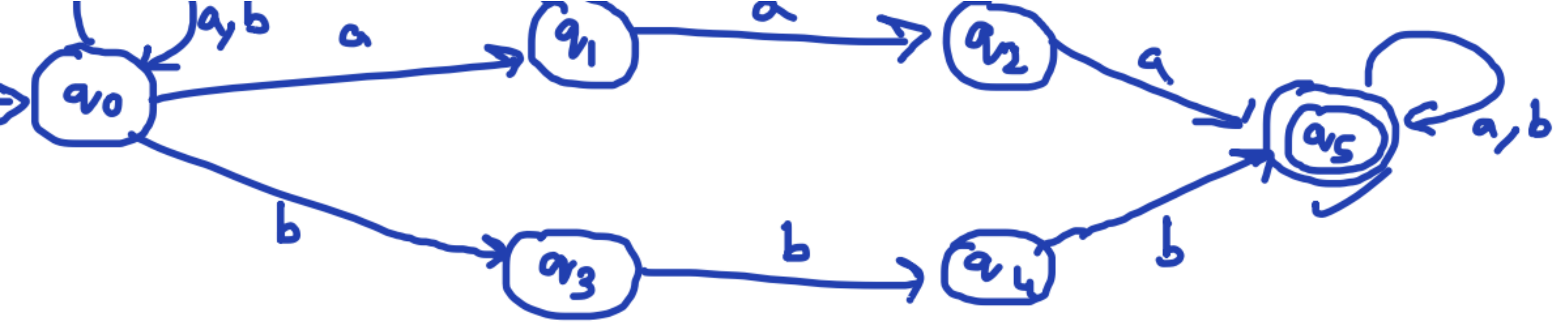
While constructing DFA from NF

$\{q_0, q_1\}$



$\{\}, \{q_0\}, \{q_1\}, \{q_0, q_1\}$





Transition Table for NFA

Σ	a	b
q_0	$[q_0, q_1]$	$[q_0, q_3]$
q_1	$[q_2]$	\emptyset
q_2	$[q_5]$	\emptyset
q_3	\emptyset	$[q_4]$
q_4	\emptyset	$[q_5]$

Transition Table for DFA

\Rightarrow

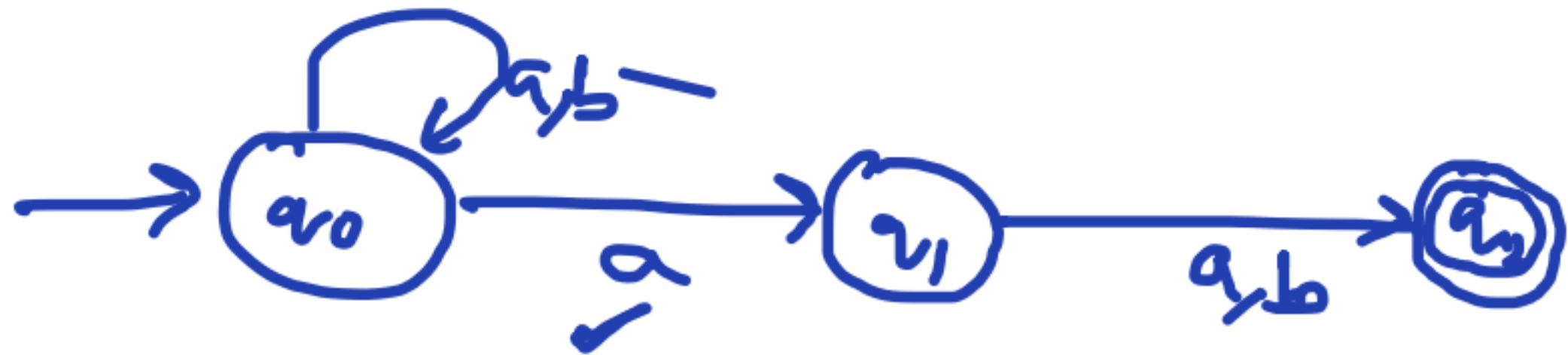
Σ	a	b
$[q_0]$	$[q_0, q_1]$	$[q_0, q_3]$
$[q_0, q_1]$	$[q_0, q_1, q_2]$	$[q_0, q_3]$
$[q_0, q_3]$	$[q_0, q_1]$	$[q_0, q_3, q_4]$
$[q_0, q_1, q_2]$	$[q_0, q_1, q_2, q_5]$	$[q_0, q_3]$
$[q_0, q_3, q_4]$	$[q_0, q_1]$	$[q_0, q_3, q_4, q_5]$



Σ	<u>NFA</u>	
	a	b
$\rightarrow q_0$	q_1	q_2
q_1	\emptyset	q_3
q_2	q_3	\emptyset
$*q_3$	\emptyset	\emptyset

Σ	<u> DFA</u>	
	a	b
$\rightarrow [q_0] = z_0$	$[q_1]$	$[q_2]$
$[q_1] = z_1$	\emptyset	$[q_3]$
$[q_2] = z_2$	$[q_3]$	\emptyset
$\emptyset = z_3$	\emptyset	\emptyset
$[q_3] = z_4$	\emptyset	\emptyset

FA



	a	b
q ₀	[q ₀ , q ₁]	q ₀
q ₁	q ₂	q ₂
q ₂	∅	∅

	a	b
→ [q ₀]	[q ₀ , q ₁]	[q ₀]
[q ₀ , q ₁]	[q ₀ , q ₁ , q ₂]	[q ₁ , q ₂]
*[q ₀ , q ₁ , q ₂]	[q ₀ , q ₁ , q ₂]	[q ₀ , q ₂]
*[q ₁ , q ₂]	[q ₀ , q ₁]	[q ₀]



aab

$[v_0, v_2, v_4, v_5]$

$[v_0, v_1, v_5]$

$[v_0, v_3, v_4, v_5]$

$[v_0, v_3, v_5]$

$[v_0, v_1, v_5]$

$[v_0, v_3, v_4, v_5]$

$[v_0, v_1, v_5]$

$[v_0, v_1, v_2, v_5]$

$[v_0, v_3, v_5]$

for a 6-State NFA \longrightarrow 9-State DFA