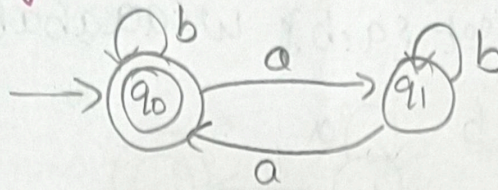


21-2-24
Wednesday.

CSA1322 - TOC
Practical Assignment-1

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192210280

- ① Design a DFA using simulator to accept even number of a's



States: q_0, q_1

Initial state: q_0

Final state: q_0

Input symbols: $\{a, b\}$

Automata = $\{\{q_0, q_1\}, \{a, b\}, \delta, q_0, q_0\}$

where δ

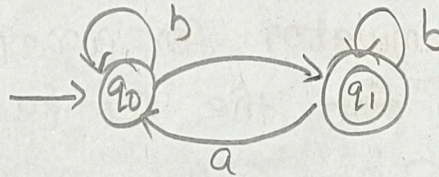
$\delta(q_0, a) = q_1$

$\delta(q_0, b) = q_0$

$\delta(q_1, a) = q_0$

$\delta(q_1, b) = q_1$

- ② Design DFA using simulator to accept odd number of a's.



States: q_0, q_1

Initial state: q_0

Final state: q_1

Input symbols: $\{a, b\}$

Automata = $\{\{q_0, q_1\}, \{a, b\}, \delta, q_0, q_1\}$

where δ

$\delta(q_0, a) = q_1$

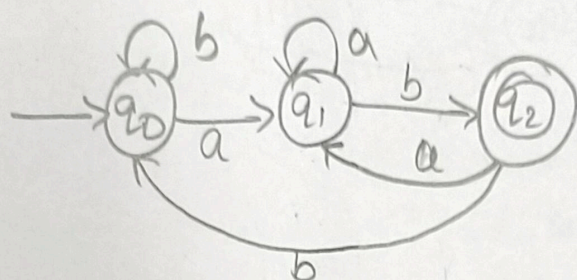
$\delta(q_0, b) = q_0$

$\delta(q_1, a) = q_0$

$\delta(q_1, b) = q_1$

- ③ Design a DFA using simulator to accept string the with ab over set $\{a, b\}$ $w = aaabab$.

Ans:



States : q_0, q_1, q_2

initial state : q_0

final state : q_2

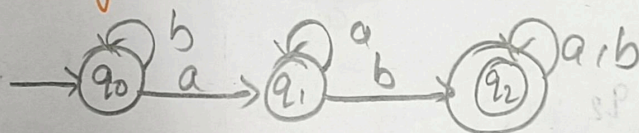
input symbols = $\{a, b\}$

Automata $\{ \{q_0, q_1, q_2\}, \{a, b\}, \delta, \{q_0, q_2\} \}$

String :- $aaabab$
 $\delta(q_0, aaabab) = \delta(q_1, aabab)$
 $= \delta(q_1, abab)$
 $= \delta(q_1, bab)$
 $= \delta(q_2, ab)$
 $= \delta(q_1, b)$
 $= q_2$
 $=$ final state
 string accepted.

- ④ Design DFA using simulator for accept the string having ab as sub string over the set $\{a, b\}$.

Ans:



States : q_0, q_1, q_2

initial state : q_0

Final state : q_2

input symbols = $\{a, b\}$

Automata = $\{ \{q_0, q_1, q_2\}, \{a, b\}, \delta, \{q_0, q_2\} \}$

where δ

$\delta(q_0, a) = q_1$

$\delta(q_0, b) = q_0$

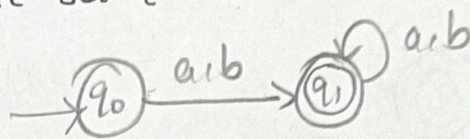
$\delta(q_1, a) = q_1$

$\delta(q_1, b) = q_2$

$\delta(q_2, a) = q_2$

$\delta(q_2, b) = q_2$.

5. Design a DFA simulator to accept the string start with a or b over the set $\{a, b\}$



$$Q = \{q_0, q_1\}$$

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

$$q_0 = q_0$$

$$F = \{q_1\}$$

where δ

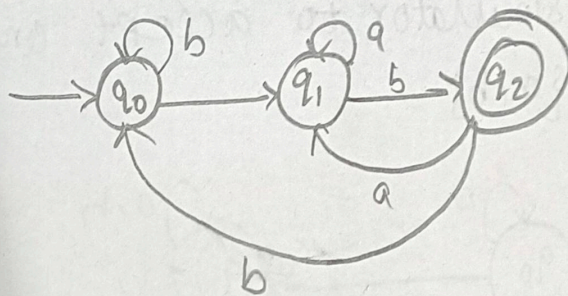
$$\delta(q_0, a) = q_1$$

$$\delta(q_0, b) = q_1$$

$$\delta(q_1, a) = q_1$$

$$\delta(q_1, b) = q_1$$

6. Design a DFA using simulator to accept the string end with ab over the set $\{a, b\}$ $w = abbaabab$.



States: q_0, q_1, q_2

initial state: q_0

Final state: q_2

input symbols = $\{a, b\}$

Automata = $\{\{q_0, q_1, q_2\}, \{a, b\}, \delta, q_0, q_2\}$

$w = abbaabab$

$$\delta(q_0, abbaabab) = \delta(q_1, bbaa$$

-bab)

$$= \delta(q_2, baabab)$$

$$= \delta(q_0, aabab)$$

$$= \delta(q_1, abab)$$

$$= \delta(q_1, bab)$$

$$= \delta(q_2, ab)$$

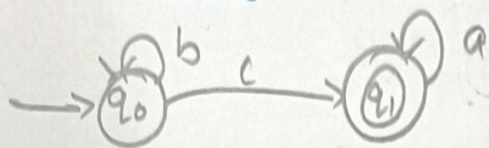
$$= \delta(q_1, b)$$

$$= q_2$$

final state

String accepted.

7. design DFA simulator to accept the input string "bc", "c", and "bcaaa".



States : q_0, q_1

Initial state : q_0

Final state : q_1

Input symbols : a, b, c

Automata = $\{ \{q_0, q_1\}, \{a, b, c\}, \delta, q_0, q_1 \}$

where δ

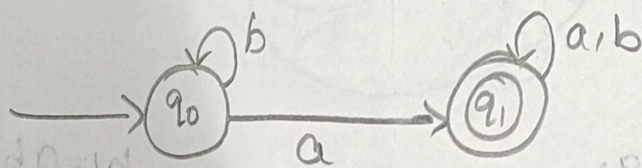
$$\delta(q_0, b) = q_0$$

$$\delta(q_0, c) = q_1$$

$$\delta(q_1, a) = q_1$$

bc, c, and bcaaa strings accepted.

8. Design a DFA Simulator to accept any number of a's where input = $\{a, b\}$



$Q = \{q_0, q_1\}$

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

$q_0 = q_0$

$f = q_1$

where δ

$$\delta(q_0, a) = q_1$$

$$\delta(q_0, b) = q_0$$

$$\delta(q_1, a) = q_1$$

$$\delta(q_1, b) = q_1$$

Automata = $\{ \{q_0, q_1\}, \{a, b\}, \delta, q_0, q_1 \}$.