৭. $L((0+1)^*) = L(\varepsilon) \cup L(0+1) \cup L((0+1)(0+1)) \cup \dots$

$= \{\varepsilon\} \cup \{0,1\} \cup \{00,01,10,11\} \cup \{000,001,\dots\}$

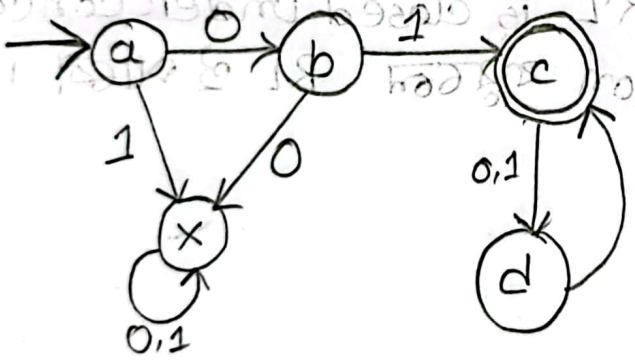
$= \{0,1\}^*$

* $L = \{w \mid w$ consists of 0's and 1's which is of even length and begins with $01\}$

R. Expression: $01((01)(01))^*$

even length র জন্য

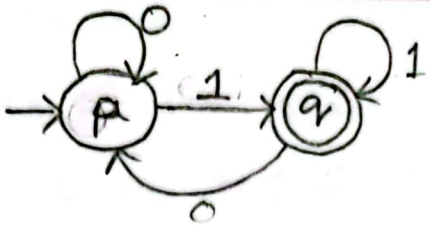
DFA



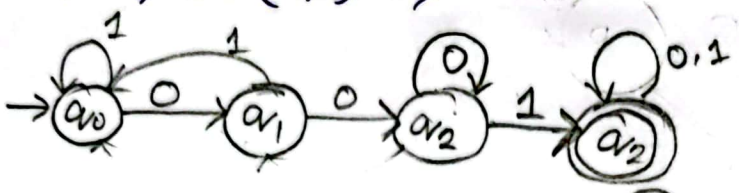

C → তে আসা মানে memorize করে রাখছি যে already 01 পেয়ে গেছি।

## Exercises:

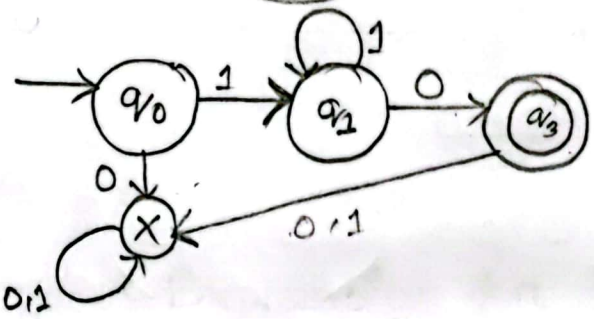
1. $(0|1)^* 1$ →



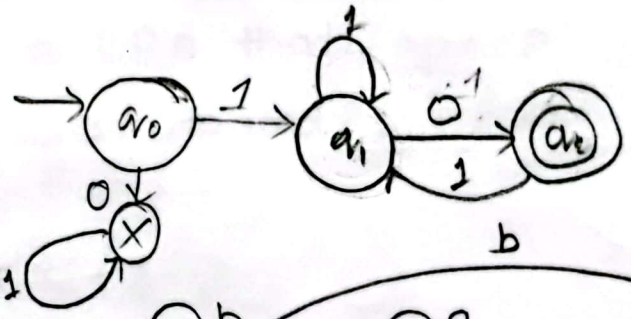

2. $(0|1)^* 00 (0|1)^*$ →



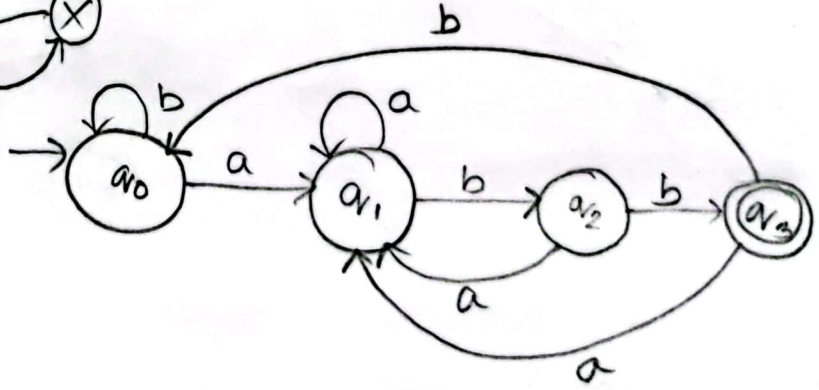

3. $1^* 10$ →




4. $1 (0|1)^*$ →




$(a|b)^* abb$ →

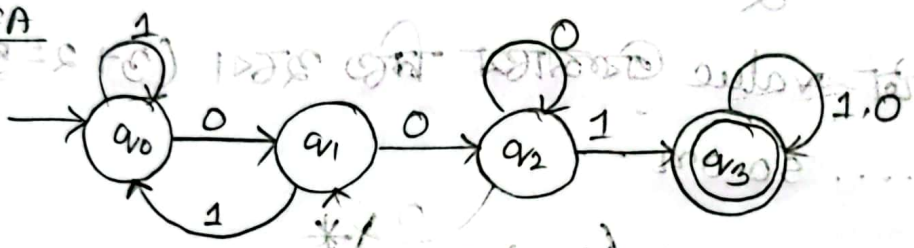


Q: Propose Regular Ex and construct a DFA.

$L = \{w \mid w$ consists of 0s and 1s that contains a substring of 2 or more 0s followed by a 1$\}$

Ans: R.E = $(0|1)^* \; 00^*1 \; (0|1)^*$

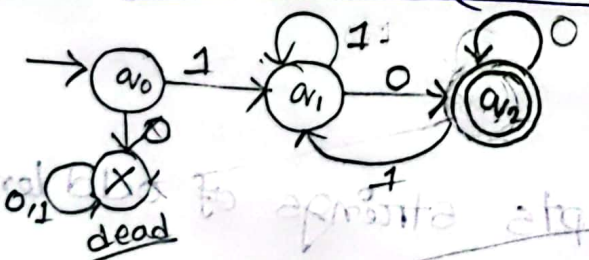
DFA




Q: Propose Regular Expression for the following language and construct a DFA that accept $L(1\,(0|1)^*\,0)$

$L = \{w \mid w$ consists of As and Bs in which two Bs do not come together$\}$

Ans: DFA for $L\,(1\;(0|1)^*\;0)$:




R.E: $(A + AB)^* \mid B(A+AB)^*$

অথবা

$(BA + A)^* (\epsilon + B)$

A B BBX
A
A A
A AB
A B A
A BAB
A A B A B

B
B A
B A A
B A B

③ Propose R.E and construct a DFA

$L = \{w \mid w$ consists of 0s and 1s which is of ODD length start with 10$\}$

Start হবে 1 0 দিয়ে তাই

Ans: যেখানে odd length বানাতে হবে min 3 হতে হয়

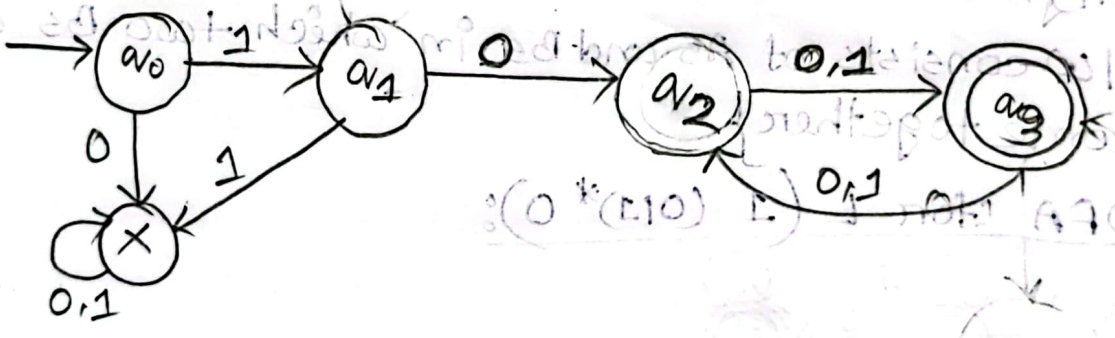
$\frac{1}{1}\ \frac{0}{2}\ \frac{(1|0)}{3}$ কিন্তু যদি odd (5, 7, 9, 11 ...) হয় তখন

3র পর দুইটা value একসাথে নিতে হবে। (3+2=5)

(5+2)=7 ..... so on.

তাই R.E = $10(0|1)((0|1)(0|1))^*$

DFA

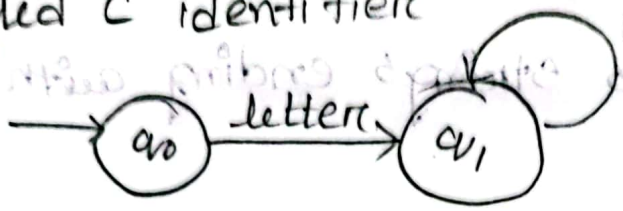



4. Design a DFA that accepts strings of odd len over alphabet $\{a, b\}$

Ans: $(a|b)((a|b)(a|b))^*$

⑤ Propose regular expressions and DFAs for the keyword int and valid C identifier.

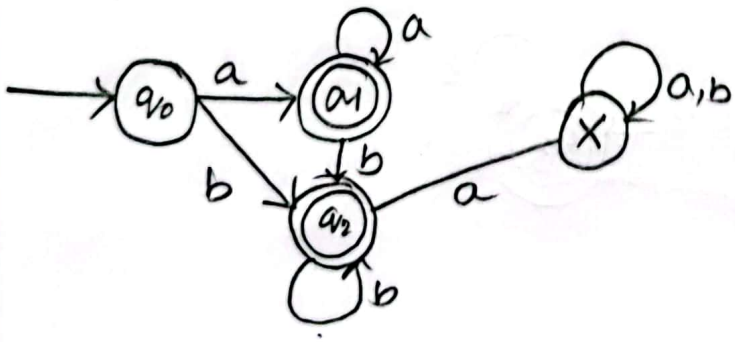
valid C identifier



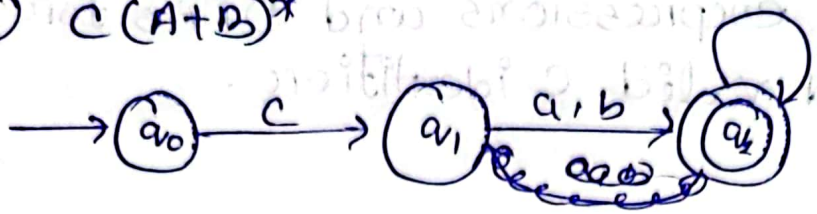

6

⑥ DFA accepts the language having all 'a' before all 'b'

Re: $a^*|b^*$

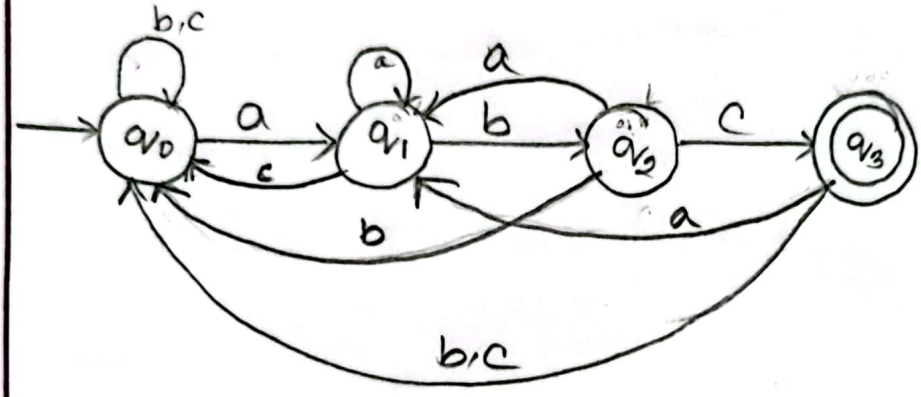


⑦ $C(A+B)^*$




⑧ DFA that accepts strings ending with 'abc'

→ $(a|b|c)^*$ abc




⑨ DFA $\{a^n b^m \mid n \bmod 2 = 0,\ m \geq 1\}$

→ a have to be even number of a

→ any number of b then.

R.E → $(a \cdot a)^* b^*$