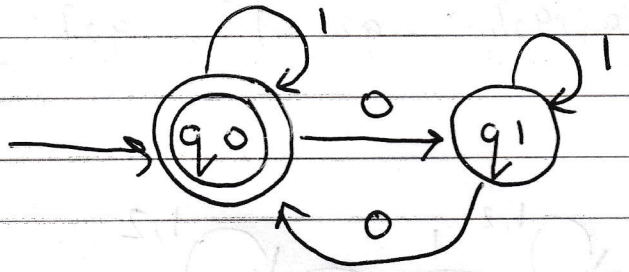
Assignment 1

Name: Daryl Fernandes
Roll: 72
ID: 2020012004
Sub: TCS

1) Alphabet $\{0, 1\}$

$L = \{ w \mid w$ contains positive even 0's$\}$

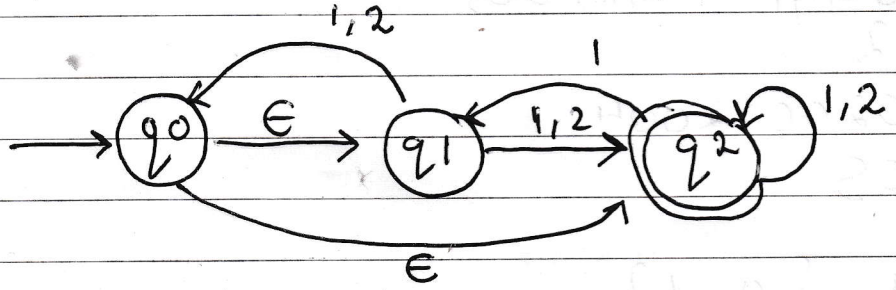


$M = \{Q, \Sigma, \delta, q_0, F\}$

$Q = q_0, q_1$
$\Sigma = \{0, 1\}$
$\delta = Q \times \Sigma$
$q = q_0$
$F = q_0$

Q \ Σ	0	1
q_0	q_1	q_0
q_1	q_0	q_1

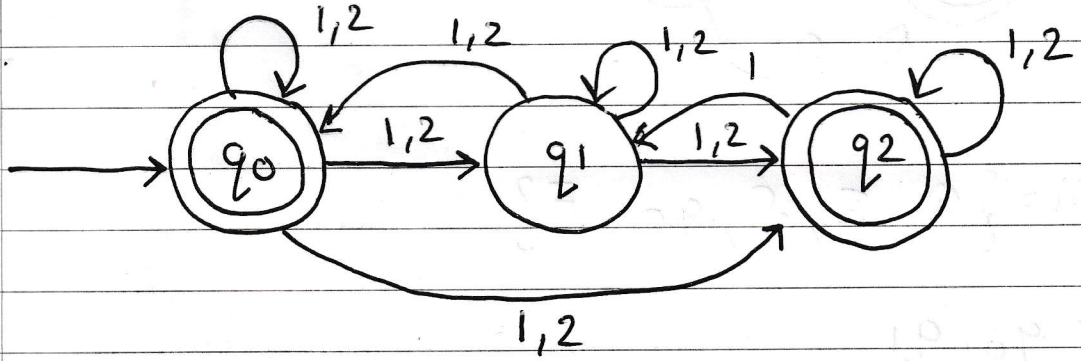
2) Construct NFA without ∈-moves



$\Sigma = \{1, 2\}$

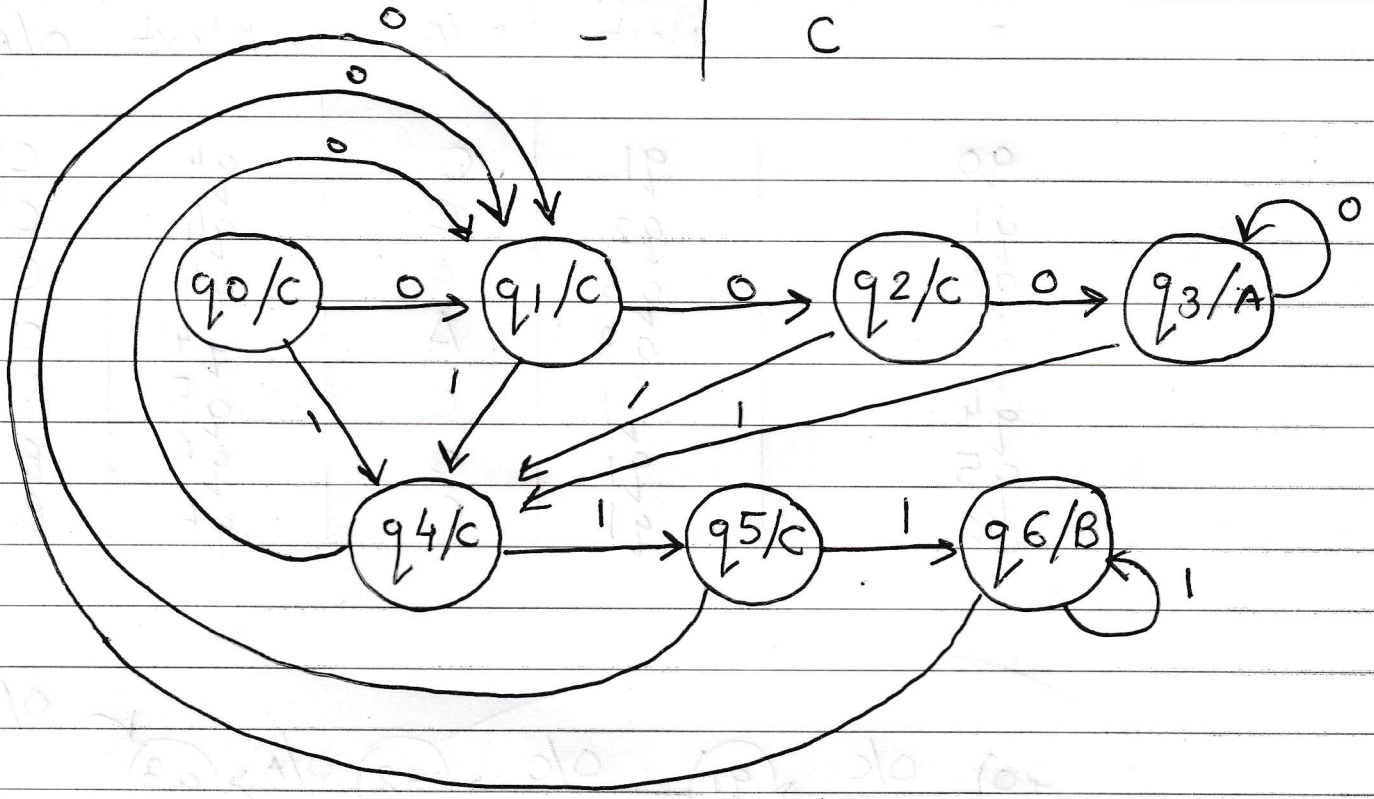
$F = \{q_2\}$

Q	∈ closure	δ(Y,0)	δ(Y,1)	δ(Y,2)	∈(x2)	∈(x3)
			1	2		
q0	{q0, q1, q2}	—	{q0, q1, q2}	{q0, q2}	{q0, q1, q2}	{q0, q1, q2}
q1	{q1}	—	q0	q0	{q0, q1, q2}	{q0, q1, q2}
q2	{q2}	—	{q1, q2}	q2	{q1, q2}	{q2}



3) $\Sigma = \{1, 0\}$

I/P	O/P
000	A
111	B
-	C



Moore Machine

Q \ Σ	I/P 0	I/P 1	O/P
q0	q1	q4	C
q1	q2	q4	C
q2	q3	q4	C
q3	q3	q4	A
q4	q1	q5	C
q5	q1	q6	C
q6	q1	q6	B

Mealy machine (equivalent)

Present state Q	I/P = 0		I/P = 1	
	Next	O/P	Next	O/P
q0	q1	C	q4	C
q1	q2	C	q4	C
q2	q3	A	q4	C
q3	q3	A	q4	C
q4	q1	C	q5	C
q5	q1	C	q6	B
q6	q1	C	q6	B