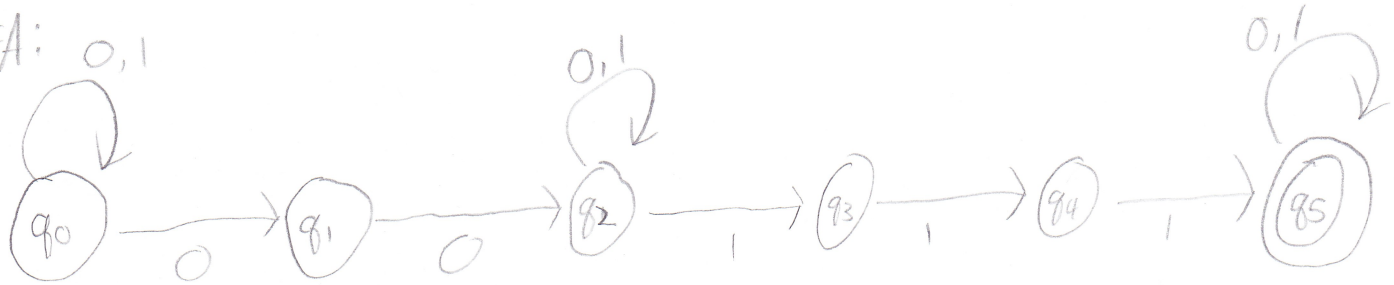
1) NFA:



$*_1 = \{q_0, q_1, q_2, q_3, q_4, q_5\}$

State	0	1
q_0	$\{q_0, q_1\}$	q_0
$\{q_0, q_1\}$	$\{q_0, q_1, q_2\}$	q_0
$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2, q_3\}$
$\{q_0, q_1, q_2, q_3\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2, q_3, q_4\}$
$\{q_0, q_1, q_2, q_3, q_4\}$	$\{q_0, q_1, q_2\}$	$\{q_0, q_1, q_2, q_3, q_4, q_5\}^{*_1}$
$\{q_0, q_1, q_2, q_3, q_4, q_5\}^{*_1}$	$*_1$	$*_1$

$q_0 = A$

$\{q_0, q_1\} = B$

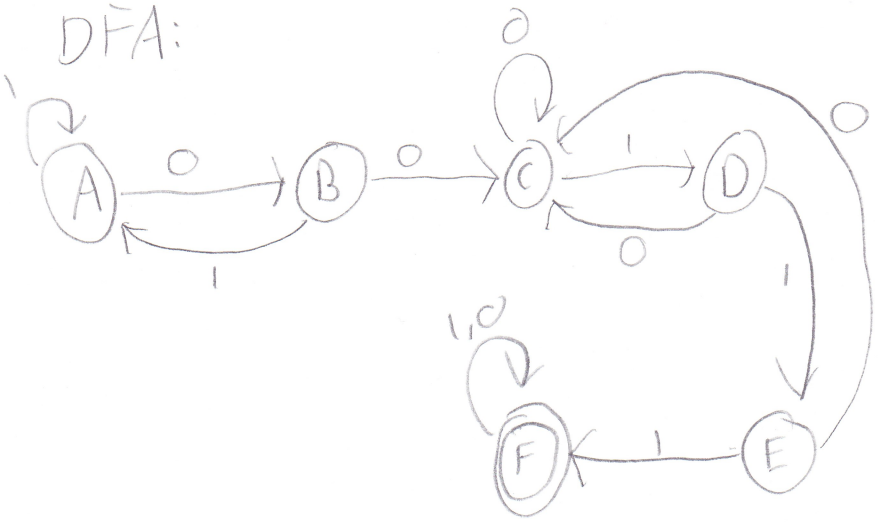
$\{q_0, q_1, q_2\} = C$

$\{q_0, q_1, q_2, q_3\} = D$

$\{q_0, q_1, q_2, q_3, q_4\} = E$

$\{q_0, q_1, q_2, q_3, q_4, q_5\} = F$

DFA:

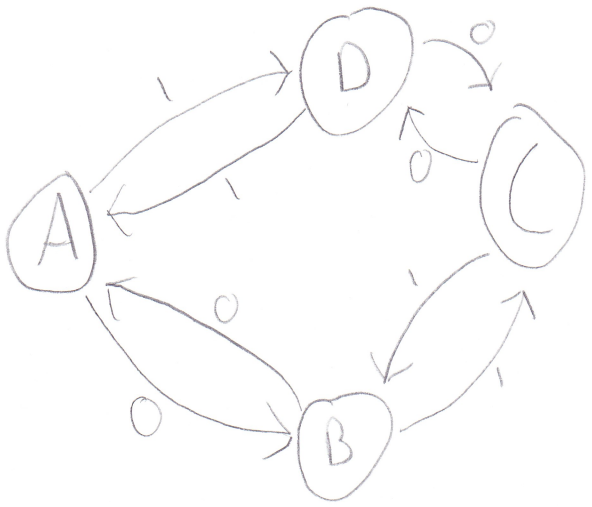


$L = \{w \mid w \in (a,b,c)^* \; w \neq abc\}$

1) $R = (a+b+c)^* - abc$

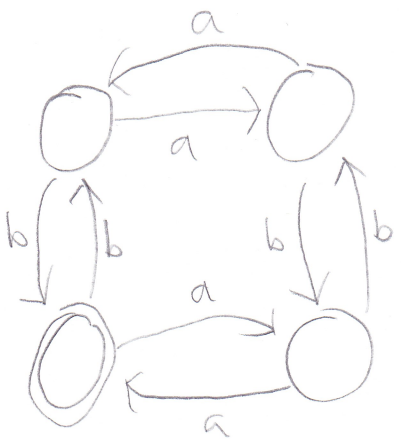
2) DFA

A = both even
B = odd 0s, even 1s
C = both odd
D = even 0s, odd 1s



3) DFA to Regular expression

$0011^*1 + 0101^*1 + 1001^*1 + 1010^*1 + 1100^*1$
$+0110^*1$



Since I can construct a DFA L_1 is regular

L_2: pumping Lemma

$w = aabbb$ $\quad w = xyz$

$|w| = 5$ $\quad x = aa$

$|w| > c$ $\quad y = bb$

$c = 4$ $\quad z = b$

$xy^2z = aabbbbb$

$2m = 5n$

Since this doesn't satisfy $3m = 2n$

L_2 is not regular