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P 3

$L = \{1^{2n}0^n : n \geq 0\}$ is not regular.

$x = 1^{2n}0^n$

$x \in L$ (suppose that L is regular)

By pumping lemma there are strings $u\,v\,w$ such that

1) $x = uvw$

2) $v \neq \epsilon$

3) $|uv| \leq n$

4) $uv^n w \in L$ for all $n \in N$

Let $n = 2$: any $n \neq 1$

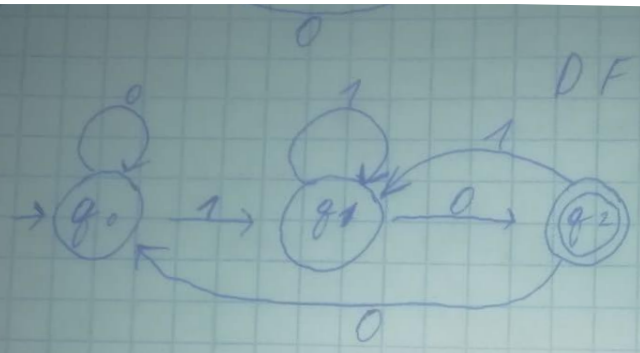
however $uv^2w = uvw = 0^{2n+j}1^n$

$j > 0$ $n + j \neq n$

therefore L is not regular.

DFA (P2)

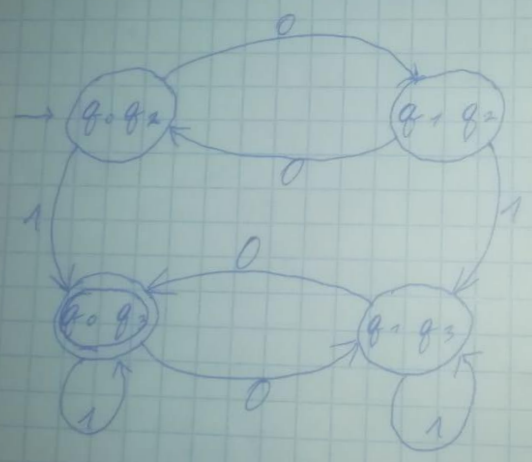
b)



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

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

P1 c) $L_1 \cap L_2 = \{$ intersection of $L_1, L_2 \}$



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

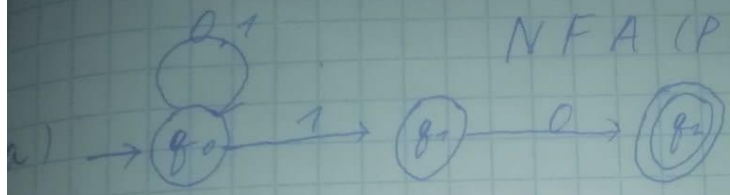
$\Sigma = \{0, 1\}$

$q_0 q_2$ - starting state

$F = q_0 q_3$

P2

NFA (P2)



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

q_0 - starting state.

$F = q_2$

q_1 q_0 q_2

(B) L_2 = { Binary strings contains at least one 1

q_2 - not contain

q_3 - contain

$Q = \{q_2, q_3\}$

q_2 - starting state $\Sigma = \{0, 1\}$

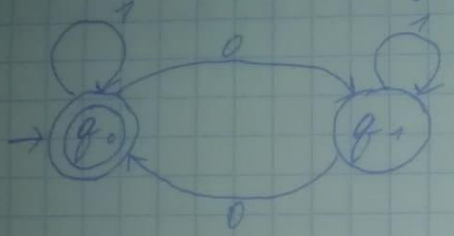
$F = q_3$

	0	1
q_2	q_2	q_3
q_3	q_3	q_3

Tautinov Edige

P_1

a) L_1 = { binary string with even of 0 }



q_0 - even

q_1 - odd

$Q = \{ q_0, q_1 \}$

q_0 - starting state

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

$F = q_0$

$\delta =$

	0	1
q_0	q_1	q_0
q_1	q_0	q_1