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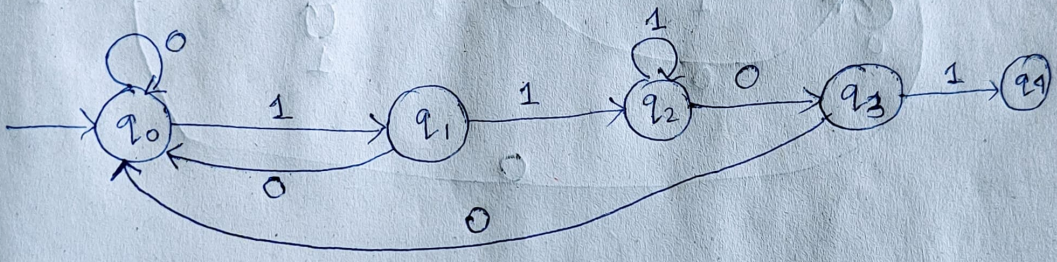
ROLL : 2021CSB065

SUBJECT : TOC

HOME TASK 5

1) $L_1 = \{ x \in \{0,1\}^* \mid x \text{ contains } 1101 \text{ as substring} \}$

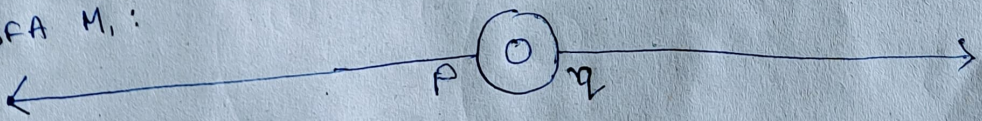
DFA M_1 such that $L(M_1) = L_1$:



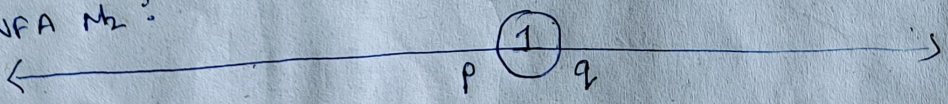
$L_2 = \{ y \in \{0,1\}^* \mid$ There exist a $x \in L_1$ exactly one bit of which is flipped to obtain $y \}$

Now representation of L_2 will be something as follows

DFA M_1 :

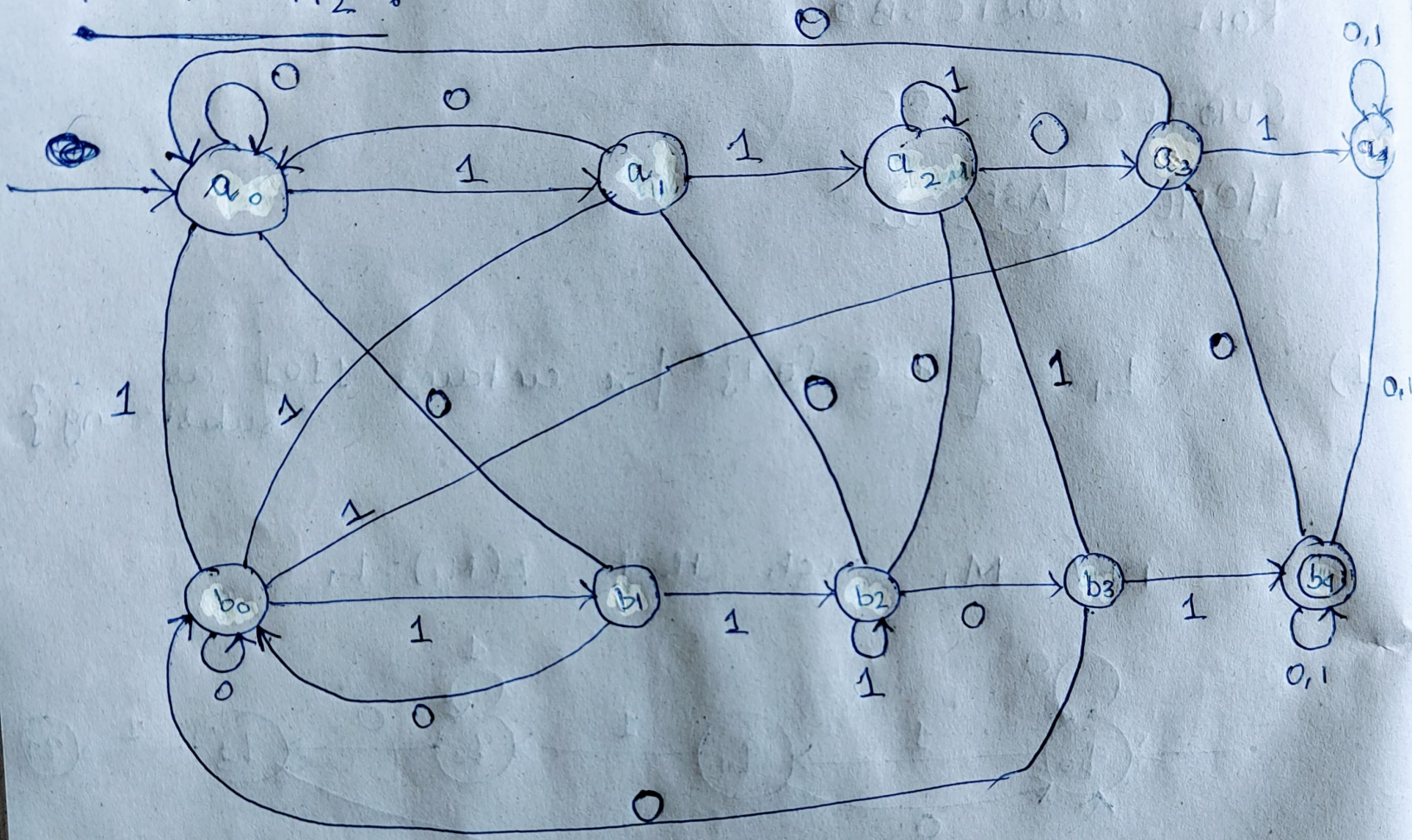


NFA M_2 :



So we need to take into account all positions where bit can be flipped and then plug it into the relevant state of copied DFA for processing.

NFA M_2 :



$a_i = (q_i, a)$ where $i = 0, 1, 2, 3, 4$

$b_i = (q_i, b)$ where $i = 0, 1, 2, 3, 4$

a, b are copies of DFA M1