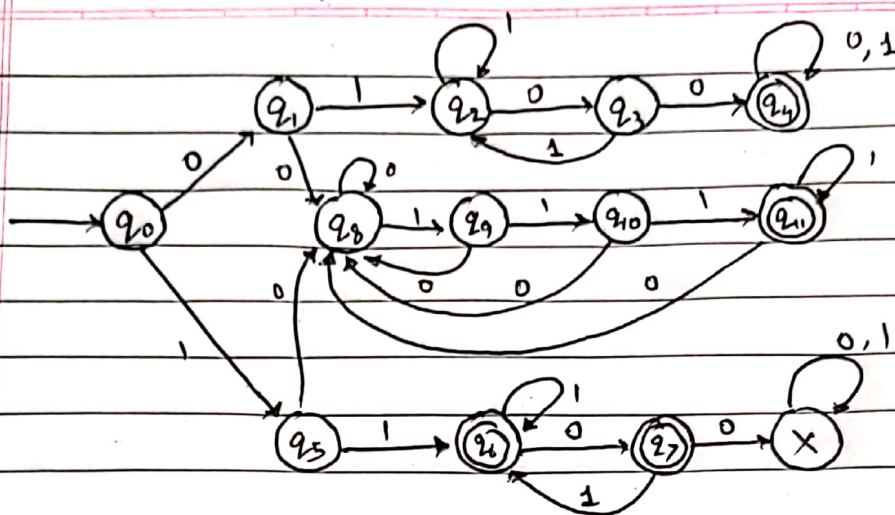


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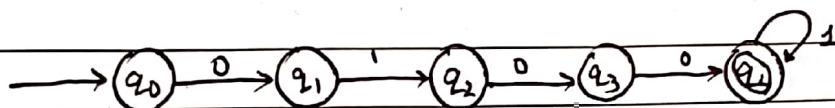
Ques 1)



eg)

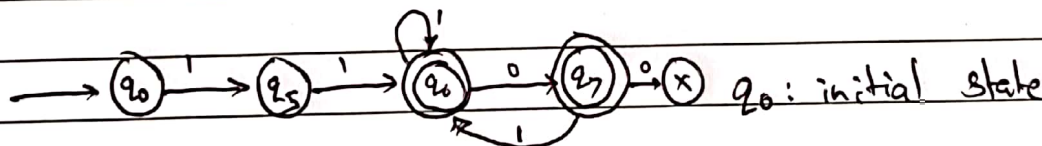
a) Acceptance:-

i) "01001" → This string is accepted since it starts with "01" and contains "00"



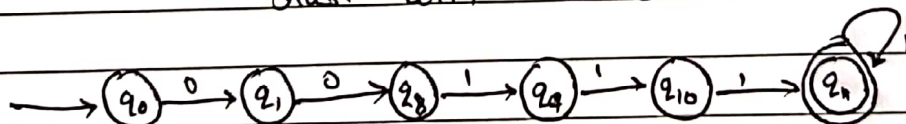
$q_0$ : initial state,  $q_4$ : final state

ii) "11011" → This string is accepted ∵ it starts with "11" and does not contain "00"



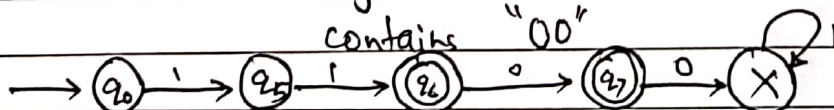
$q_0$ : initial state

iii) "00111" → This string is accepted as it does not start with "10" or "11" and ends with "111"



b) Rejected

"110001" → rejected as it starts with "11" and contains "00"



Ans 2) a) DFA are finite state machine that accept or reject strings of characters by passing them through a sequence that is uniquely determined by each string.

The term "deterministic" refers to the fact that each state sequence and every string is unique whereas the term "finite" refers to the fact that there are limited number of possible states which can be reached.

b) Automata theory is the study of abstract machines and the problems which they are able to solve. These abstract machines are called automata.

It takes a symbol as input and converts it from one state to another according to the transition function.

The transition function tells us which state to go next, given current state and symbol.

eg) DFA can be <sup>used to</sup> model a software which computes whether an online user's input for a field like email is valid or not.