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17/SCI01/076

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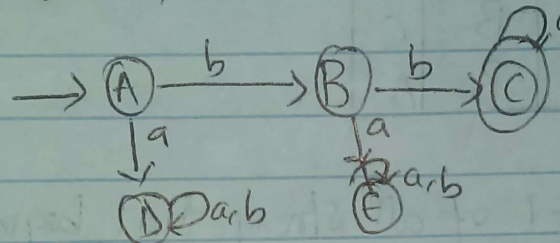
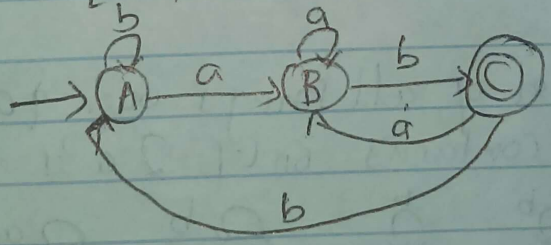
1) A finite automata is the simplest form of computation, it has very limited memory. It is an abstract machine that can be in exactly one of a finite number of states at a time. FA is the simplest machine to recognize patterns.
It takes the string of symbol as input and changes its state accordingly. When the desired symbol is found, then the transition occurs.

b) A deterministic finite automata (DFA) is represented formally by a 5-turple ie $\langle \delta, Q, \Sigma, q_0, f \rangle$, where;
Q = Set of all states
Σ = Inputs
q_0 = Initial state
f = Set of final states
δ = transition function.

2) L = set of all strings starting with bb
L = { bb, bba, bbab, bbaa, ... }



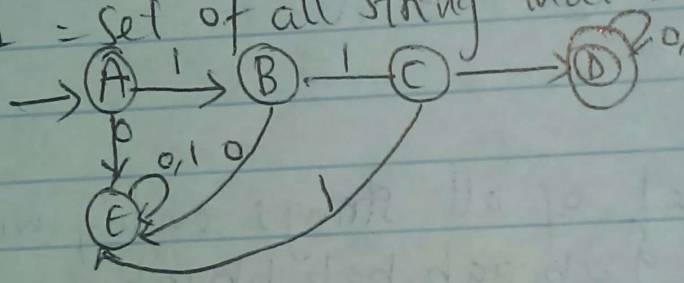
3) L = set of all strings ending with ab
i.e { ab, aab, bab, bbaab, ... }



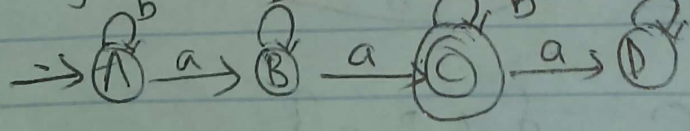
$Q = \{A, B, C\}$
$q_0 = A$
$\Sigma = \{a, b\}$
$\delta = ($
$=$

	a	b
A	B	A
B	B	C
C	B	A

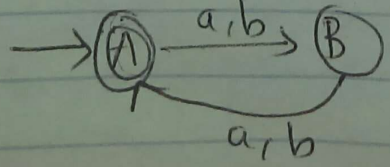
4) L = set of all string that begin with 110



3) i) L = set of all strings over {a, b} that the string contains only 2 a's



ii) L = set of all string over {a, b} that $w \in \{a,b\}^* / |w| = 0 \bmod 2$



iii) L = set of all string over {a, b} that w ∈ {a, b} |w| = 2 mod 3