CS & IT ENGINEERING

Theory of Computation

Finite Automata

DPP 07 Discussion



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TOPICS TO BE COVERED

01 Question

02 Discussion

Let
$$L_1 = \phi$$
, $L_2 = \{\epsilon\}$, $L_3 = \{a, \epsilon\}$.



 L_1 , L_2 , L_3 are languages defined over $\Sigma = \{a\}$ then, $L_3.L_2.L_1^* + L_1.L_3$ is____.

[MCQ]

φ

$$(\alpha+\epsilon)$$
. ϵ . ϕ^* + ϕ . $(\alpha+\epsilon)$

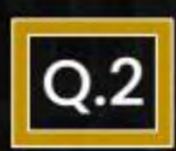
В.

{a}

c. {a, ε}

D.

 $\{a^n\mid n\geq 2\}$



Consider the following given grammar



$$S \rightarrow AB$$

$$A \rightarrow AS \mid a$$

$$B \rightarrow BA | SB | b$$

Which of the following string generated by above grammar?



bbaa





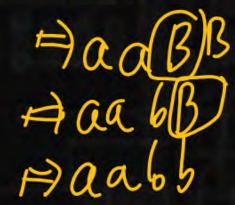


baba

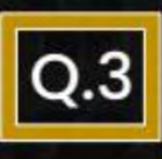




aabb

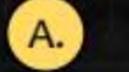


baab



If the finite automaton M has 100 states and all the states are Non final except initial state over the alphabet $\Sigma = \{0, 1\}$ then the set L(M) can be:

E # L(M)



φ



C. {ε}

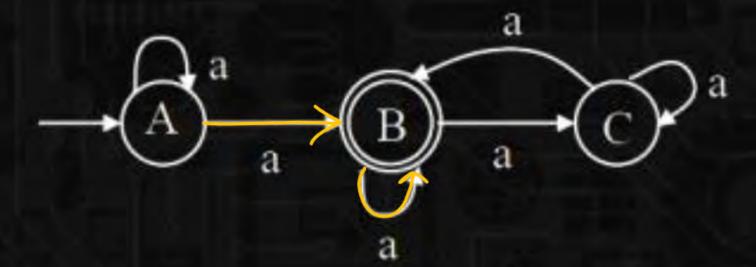


Subset of Σ



Consider the following finite automata.





Find the language accepted by above FA?









Q.5

Which of the following language does not satisfy the prefix



$$L = \{ \underbrace{wxw^R}_{a \ b \ a} | kw \in (0+1)^* \}$$

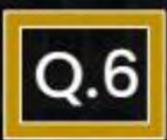


$$L = \{a^m b^{2m} \mid m \ge 1\} = \{a^{\frac{1}{2}}, a^{\frac{1}{2}}, \dots\}$$



$$L = \{w \in (0+1)^* \mid n_0(w) = n_1(w)\}$$

$$= \{ \varepsilon, (0) \mid 0 \text{ or } 0 \}$$



Consider the following left linear Grammar.



$$S \rightarrow Sa|Sb|A \Rightarrow S \rightarrow Sa|Sb|(ab)^*$$

 $A \rightarrow Aab|\epsilon \Rightarrow L(A) = (ab)^*$

Choose the correct language generated by the above grammar.

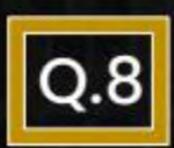
Consider a language $L = \{w \mid w \in \{a, b\}^*, 5^{th} \text{ symbol from end is } \mathbb{W} \}$



'a'}

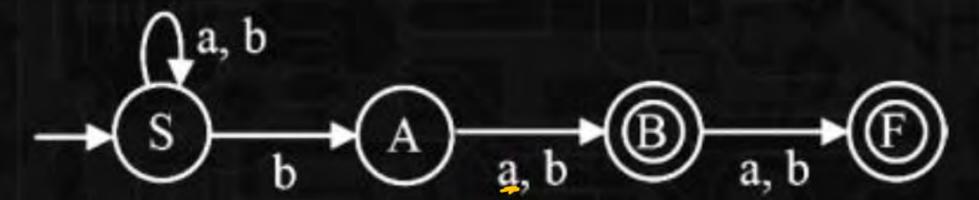
If number of state in NFA is P and Number of states in MDFA (minimal DFA) is Q then the value of PXQ is ____. [NAT]

$$P = 5+1 = 6$$
 $Q = 2^5 = 32$
 192

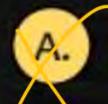


Consider the following finite automaton:





Which one of the following is correct representation of above finite automaton? [MCQ]



Second symbol from ends is 'b'.

ba



Containing (b + ab + ba) as a substring.



Third symbol from ends is 'b'



None of these.



