Welcome To My Presentation

My Presentation Topics is
"FA for the language of all those strings containing a1 as a substring"

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What is FA?

➤ Finite automata(FA) are used 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.

➤ We can solve this given question by using DFA or NFA. Here we use DFA to solve this problem.

What is DFA?

➢ DFA refers to **Deterministic Finite Automata**. Deterministic refers to the uniqueness of the computation. The finite automata are called finite automata if the machine is read an input string one symbol at a time.

➢ In DFA, there is only one path for specific input from the current state to the next state.

➢ DFA does not accept the null move, i.e., the DFA cannot change state without any input character.

➢ DFA can contain multiple final states. It is used in Lexical Analysis in Compiler.

Solve using DFA

- A DFA is defined by the 5-tuple:

  $$\{Q, \sum, q_0, F, \delta\}$$

- Here,

  - Q: finite set of states
  - $\sum$: finite set of the input symbol
  - q_0: initial state
  - F: final state
  - δ: Transition function

How to use an DFA?

➤ <u>Input:</u> a word w in $\sum$*

➤ <u>Question:</u> Is w acceptable by the DFA?

➤ <u>Steps:</u>

- Start at the "start state" q_0
- For every input symbol in the sequence w do

  - Compute the next state from the current state, given the current input symbol in w and the transition function

- If after all symbols in w are consumed, the current state is one of the accepting states (F) then *accept w;*
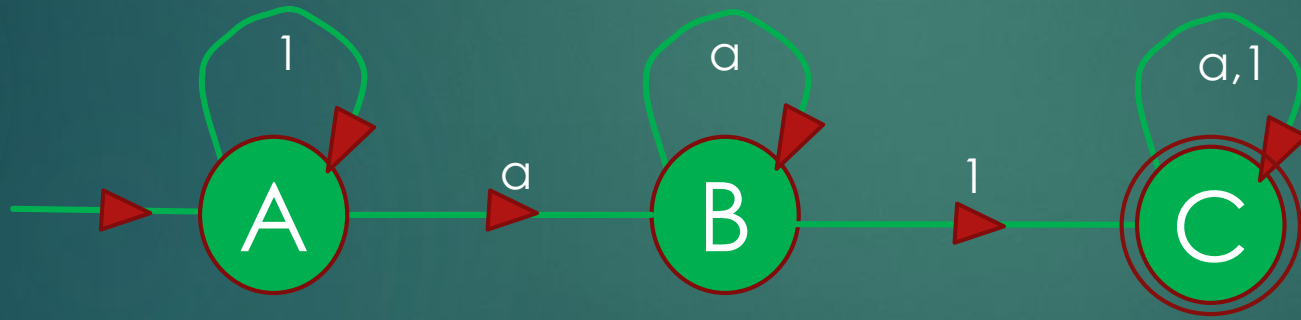- Otherwise, *reject w.*

Problem Solve

❑ Question :

FA for the language of all those strings containing a1 as a substring.

❑ Solve :

Input Alphabet, $\sum$ ={ a, 1}

Language, L ={a1, a11, 11a1, 111a1a1a1a, a1aa1,1a1a1a11a11a, ………..}

Transition Diagram

Problem Solve

Five Tuple :

- A finite set of states, $Q = \{A, B, C\}$
- A finite set of input symbols, $\sum = \{a, 1\}$
- Start state $, q_0 = A$
- Set of accepting states, $F = \{C\}$

Transition Table		
δ	a	1
A	B	A
B	B	C
*C	C	C

States

Symbol

Application of FA

➢ For **the designing of lexical analysis of a compiler**.

➢ For recognizing the pattern using regular expressions.

➢ For the designing of the combination and sequential circuits using Mealy and Moore Machines.

Thank You