## CS & IT ENGINEERING



## Theory of Computation Finite Automata

Finite Automata
Closure Properties of Regular

Languages-1
DPP 13 Discussion



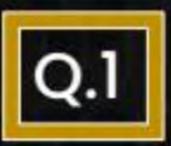
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TOPICS TO BE COVERED

01 Question

02 Discussion



## Consider the following statements:



S<sub>1</sub>: Kleene Closure (\*) of infinite set is always finite.

S<sub>2</sub>: Kleene Closure (\*) of finite set is always infinite.

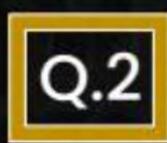
Which of the following is correct?



$$S_2$$
 only.

- Both S<sub>1</sub> and S<sub>2</sub> are correct.
- None of these.

$$(Fin)^* \Rightarrow ?$$



## Consider a language L, then subset of L will be?



- Regular.
- Subset of L > may be fin Regular but finite.
- Non-regular.
- None of these.

Consider two languages  $L_1$  and  $L_2$ .



$$L_1 = a^*b^* \longrightarrow \%$$

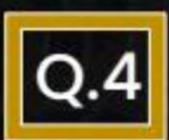
$$L_1 = a^*b^* \longrightarrow \%$$

$$L_1 \cap L_2 = \alpha^* + \beta^*$$

$$L_2 = b^*a^* \longrightarrow \gamma \vee \gamma$$

Which of the following is/are correct for above languages.

- A.  $L_1 \cup L_2$  is regular.
- B. For  $L_1 \cup L_2$  regular expression will be  $(a + b)^*$ .
- C.  $L_1 \cap L_2$  is regular.
- D. For  $L_1 \cap L_2$  regular expression will be  $(a^* + b^*)$ .



If subset of  $L_1$  is regular then what is  $L_1$ ?



- A.  $L_1$  must be finite.
- B. L<sub>1</sub> must be regular.
- L<sub>1</sub> must be non-regular.
- D. None of these.



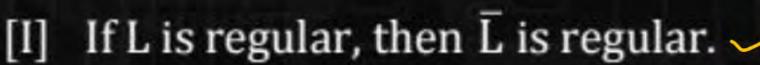


Regular language does not close under on which operation?



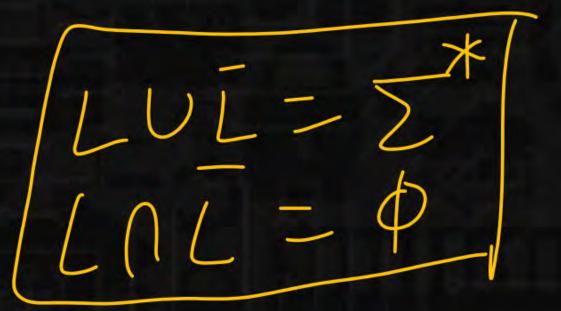
- A. Complement
- B. Union X
- C. Subset
- D. Intersection

Consider the following statements:



[II] If L is regular, then L is regular.

[III] Union of L and its complement is  $\Sigma^*$ .





Let 
$$L_1 = \{ \in \}$$

$$L_2 = \{a^+\}$$



Then which of the following is correct?

A. 
$$L_1 \cap L_2 = \in$$
.

- B.  $L_1 \cup L_2 = \text{any language.}$   $L_1 \cup L_2 = \frac{1}{\alpha}$
- C.  $L_1 \cup \overline{L}_2 = \in$ .
- D. None of these.



