

Regular Languages :-

↳ a language is said to be a Regular Language if and only if some FSM recognises it.

→ So what languages are NOT Regular?

(i) languages which are not recognised by any FSM

(ii) which require memory

⇒ Memory of FSM is very limited

⇒ It cannot store or count strings

eg:- ababb ababb → Not Regular.

need memory to store so that it can be repeated

eg:- $a^n b^n$ → Not Regular
same ∴ need to remember no. of a's first for b's to be made

Regular Expressions

(1)

(2)

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0 → Operations on Regular Languages :

① Union - $A \cup B = \{x \mid x \in A \text{ or } x \in B\}$

② Concatenation - $A \circ B = \{xy \mid x \in A \text{ or } x \in B\}$

③ Star - $A^* = \{x_1 x_2 x_3 \dots x_k \mid k \geq 0 \text{ and each } x_i \in A\}$

eg: 1 → $A = \{pq, r\}$, $B = \{t, uv\}$

$A \cup B = \{pq, r, t, uv\}$

$A \circ B = \{pqt, pquv, rt, ruv\}$

$A^* = \{\epsilon, pq, r, pqr, rpq, pqpq, rr, pqpqr, \dots\}$

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Theorem 1 :- The class of Regular Languages is closed under UNION.

Theorem 2 :- The class of RL is closed under CONCATENATION.