

Regular languages :-

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

→ do most 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:- ababbb ababbb → Not Regular

need memory to store to trace it
can be repeated

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

Regular Expressions

(2)

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 - $A^* = \{x_1 x_2 x_3 \dots x_n \mid n \geq 0 \text{ and each } x_i \in A\}$

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

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

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

$$A^* = \{\epsilon, pq, r, pq, r, pq, r, \dots\}$$

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

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