

In the field of theoretical computer science, particularly in the area of formal languages and automata theory, a regular set refers to a set of strings that can be recognized or described by a regular expression, a finite automaton, or an equivalent formalism.

Formally, a regular set over an alphabet Σ is defined as follows:

1. The empty set \emptyset and the set containing the empty string $\{\epsilon\}$ are regular sets.
2. For each symbol $a \in \Sigma$, the singleton set $\{a\}$ is a regular set.
3. If A and B are regular sets, then their union $A \cup B$, concatenation $A \cdot B$, and Kleene star A^* are also regular sets.

In other words, regular sets can be built from basic building blocks (symbols, the empty set, and the empty string) using operations such as union, concatenation, and the Kleene star. These operations allow the construction of regular expressions, which are symbolic representations of regular sets.

Regular sets have many useful properties, including closure under complementation, intersection, and difference. They form the foundation of regular languages and are fundamental in the study of formal languages and automata theory. Regular sets are used to describe and analyze various aspects of computation, such as pattern matching, lexical analysis, and regular expressions in programming languages.

What is Regular Set in TOC ?

Ans. Regular sets are set which are accepted by FA (finite automata).

For example:

$L = \{\epsilon, 11, 1111, 111111, 11111111, \dots\}$

Here L is language set of even number of 1's.

Finite automata for above language L is,



The give set L is regular set because we can represent it using finite automta.

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