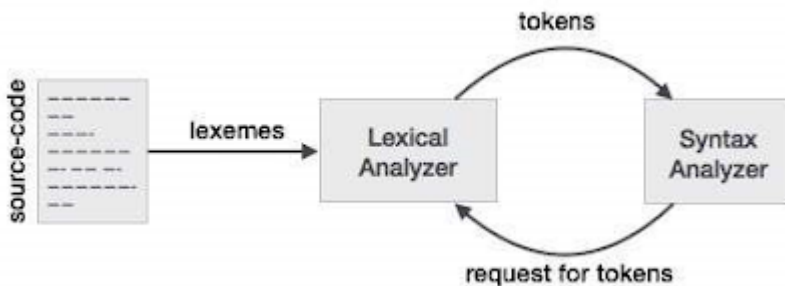




1. The lexical analyzer breaks syntaxes into a series of tokens, by removing any whitespace or comments in the source code.
2. If the lexical analyzer finds a token invalid, it generates an error. It reads character streams from the source code, checks for legal tokens, and passes the data to the syntax analyzer when it demands.




In programming language, keywords, constants, identifiers, strings, numbers, operators and punctuations symbols can be considered as tokens. For example, in C language, the variable declaration `int value = 100;` contains the tokens: `int` (keyword), `value` (identifier), `=` (operator), `100` (constant) and `;` (symbol).

Lexeme	Token
=	EQUAL_OP
*	MULT_OP
,	COMMA
(LEFT_PAREN





Let us understand how the language theory undertakes the following terms:

1. Alphabets
2. Strings
3. Special symbols
4. Language
5. Longest match rule
6. Operations
7. Notations
8. Representing valid tokens of a language in regular expression
9. Finite automata

1.  Any finite set of symbols

- {0,1} is a set of binary alphabets,
- {0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F} is a set of Hexadecimal alphabets,
- {a-z, A-Z} is a set of English language alphabets.

2.  Any finite sequence of alphabets is called a string.

3.  A typical high-level language contains the following symbols:

Arithmetic Symbols	Addition(+), Subtraction(-), Multiplication(*), Division(/)
Punctuation	Comma(,), Semicolon(;), Dot(.)
Assignment	=

- x^* means zero or more occurrence of x .
- x^+ means one or more occurrence of x .

9. XXXXXXXXXX Finite automata is a state machine that takes a string of symbols as input and changes its state accordingly. If the input string is successfully processed and the automata reaches its final state, it is accepted. The mathematical model of finite automata consists of:

- Finite set of states (Q)
- Finite set of input symbols (Σ)
- One Start state (q_0)
- Set of final states (q_f)
- Transition function (δ)

The transition function (δ) maps the finite set of state (Q) to a finite set of input symbols (Σ),
 $Q \times \Sigma \rightarrow Q$

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