Formal Language & Regular Expressions:

→ It a set of words, (i.e.) finite strings of letters symbols or tokens.

Regular Expressions:

→ A sequence of symbols & characters expressing a string or pattern to be searched for within a longer piece of text.

Languages: (L)

Eg1:- $\Sigma = \{a, b\}$.

$\Sigma = \{a, b, c, \ldots\ldots z\}$.

$\Sigma^* = \{\epsilon, a, b, c, \ldots\ldots z, aa, ab, ac \ldots\ldots zz \ldots aaa\ldots\}$.

Eg2:-

$\Sigma = \{a, b\} = \Sigma^* = \{\epsilon, a, b, ab, ba, aa, bb, aaa\ldots\}$

L = Set of all the strings starts with a.

$L = \{a, aa, ab, aaa, abb, aab, \ldots\ldots\}$.

Eg3:

L = Set of all the strings ends with bb.

$L = \{bb, abb, aabb, aaabb, \ldots\ldots\}$.

Language Definition:- (L).

Let Σ be an alphabet and Σ^* be the set of all strings over Σ. consider a subset of Σ^*, this subset is called language over Σ and denoted by L.

$$L \subseteq \Sigma^*$$

(subset.)

$\Sigma = \{a, b\}$.

$L = \{$ starts with a and ends with b$\}$.

$= \{ab, aab, aabb, aaabb, abbb, \ldots\}$.

RE = a(a+b)* b.

$\Sigma = \{0, 1\}$

$L = \{$ ends with 11$\}$.

$= \{11, 011, 0011, 01011, 1111, 01111, \ldots\}$.

RE = (0+1)* 11.

R.E = ~~(0+1)* 11~~. $(a+b)^* bb = \{\epsilon, a, b, aa, ab, ba, bb, \ldots\} bb$.

$= \{bb, abb, bbb, aabb, abbb, \ldots\}$.

$L = \{$ ends with bb$\}$.

Basic expression:

$a^* = \{\epsilon, a, aa, aaa, aaaa \ldots\}$.

$1^* = \{\epsilon, 1, 11, 1111, 111111, \ldots\}$.

$(0+1)^* = \{\epsilon, 0, 1, 01, 00, 10, 000, 1111, \ldots\}$

$(00)^* = \{\epsilon, 00, 000, 0000 \ldots\}$.

$(01)^* = \{\epsilon, 01, 0101, 010101, \ldots\}$.

$01^* = \{\epsilon, 1, 11, 111, 1111, 11111, \ldots\}$.

$= \{0, 01, 011, 0111, 01111, 011111 \ldots\}$.

$L = \{$ starts with zero followed by 0 to n, no. of 1's$\}$.