RE

$\phi \Rightarrow \{\}$ ✓

$\epsilon \Rightarrow \{\epsilon\}$ ✓

$a \Rightarrow \{a\}$ ✓

$a^*_{0-n} \rightarrow \{\epsilon, a, aa, aaa, \ldots\}$

$a^+ \Rightarrow a.a^*$
$a^*.a$

$1-n$

$= \{a, aa, aaa, \ldots\}$

$(a+b)^* \Rightarrow \{\epsilon, a, b, aa, ab, bb, ba, \ldots\}$

set of all strings possible over a, b

Examples of RE

$\Sigma = \{a, b\}$ set of string length exactly 2

$L_1 = \{aa, ab, ba, bb\}$

Since the language is finite

definitely it FA & RE is going to be finite

$aa + ab + ba + bb$

$a(a+b) + b(a+b)$

for length 2 $\underbrace{(a+b)\ (a+b)}$

length 3
$(a+b)(a+b)(a+b)$

length 4
$(a+b)(a+b)(a+b)(a+b)$
goes on it n...

Set of language length is atleast 2

$L_1 = \{ aa, ab, bb, ba, aaa \dots \}$
2, 3, 4, ...
here language is infinite

$(a+b)(a+b)(a+b)^*$

Set of all string of length atmost 2

0, 1, 2.

$L_1 = \{ \epsilon, a, b, aa, ab, ba, bb \}$
finite language apply union

$\epsilon + a + b + aa + ab + ba + bb$

$(a+b+\epsilon)(a+b+\epsilon)$

$\{ aa, ab, a, ba, bb, b, \epsilon \}$

$A \to \alpha A$

$A \to \alpha$

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

even length strings

$L = \{\epsilon, aa, ab, ba, bb, \dots\}$

$$\boxed{((a+b)(a+b))^*}$$

$$((a+b)^2)^*$$

$$= (a+b)^{2*}$$

$$= (a+b)^{2n}$$

$n \geq 0$

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

odd length string

$(a+b)^{2n+1}, n \geq 0$

$$(a+b)^{2n} (a+b)$$

$$((a+b)^2)^* (a+b)$$

$$\boxed{((a+b)(a+b))^* a+b.}$$

INF

A
0-N

A → ~~NS~~y
T.NT

ε-production

1, ε-NFA to DF
2. RE
3. Addrents
4 ...

divisible by 3

$L = 0, 3, 6, 9, 12 \ldots$

$((a+b)(a+b)(a+b))^*$

$\cong \alpha \bmod 3 \rightarrow$ if the no is divisible by 3 & gets reminder α

$(a+b)^{3n+\alpha}, n \geq 0$

$\boxed{((a+b)(a+b)(a+b))^* / ((a+b)(a+b))}$

$\Sigma = \{a, b\}$ ① no's a's have to be exactly 2

$b^* a b^* a b^*$

ⓐ no of a's atleast 2

$b^* a b^* a (a+b)^* / (a+b)^* a (a+b)^* a (a+b)^*$

③ no of a's atmost 2

$b^* (\epsilon + a) b^* (\epsilon + a) b^*$

a's are even

$(b^* a b^* a)^* . b^*$

ends with a

$(a+b)^* a$

Starts with a

$a (a+b)^*$