

Regular expression

- union $+$ $\rightarrow r_1 + r_2$
- concatenation $\cdot$ $\rightarrow r_1 \cdot r_2$
- Kleen $*$ $\rightarrow r_1^*$

a) $\phi, \epsilon, a \in \Sigma$
 $\{\}, \{\epsilon\}, \{a\}$

<u>R.E</u>	<u>Language</u>
ϕ	$L = \{ \}$
ϵ	$L = \{ \epsilon \}$
a	$L = \{ a \}$
a^*	$L = \{ \epsilon, a, aa, aaa, \dots \}$
a^+	$L = \{ a, aa, aaa, \dots \}$ i.e. <u>aa^*</u> or <u>a^+a</u>
$(a+b)^*$	$L = \{ \epsilon, a, b, aa, ab, ba, bb, \dots \}$
$(a+b)$	$L = \{ a, b \}$
ab	$L = \{ ab \}$
$(a+b+c)$	$L = \{ a, b, c \}$

$$(ab + a)b$$

$$L = (ab, a)b$$

$$= (ab, a)b$$

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

$$L = (a, ba)(b, a)$$

$$L = ab, bab, aa, baa$$

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

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

$$L = ab + b$$

$$(a + b)^2$$

$$(a + b) \cdot (a + b) \Rightarrow \{ab + aa + bb + ba\}$$

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

$$L = ? \Rightarrow (a + b)^+$$

$$L = \{a, b, aa, bb, \dots\}$$