

$$M = (Q, \varepsilon, \delta, q_0, F)$$

$$F \subseteq Q, \quad \delta: Q \times \Sigma \rightarrow Q$$

$$q_0 \in Q$$

PFA math description

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A a set of  $w \in \Sigma^*$ ,  
that are in the language

$$A \subseteq L$$

B "

$$\textcircled{1} \quad A = B$$

$$\textcircled{2} \quad A \cup B$$

$$\textcircled{3} \quad A^*$$

① Concatenation

$$\underline{A \circ B} = \{ wv \mid w \in A, v \in B \}$$

$$A = \{ a, ab \}$$

$$B = \{ \epsilon, ba \}$$

$$A \circ B = \{ \begin{array}{l} a\epsilon, ab\epsilon, \\ a\epsilon ba, ab\epsilon ba \end{array} \}$$

concat. continued

$a b a$

$A = \{ a \}$

$B = \{ b \}$

$$(A \circ B) \circ A$$

$$A \circ B = \{ a b \} \quad B \circ A = \{ b a \}$$

② Union  $A, B$

$$\rightarrow A \cup B = \{ w \mid$$

③

Star  $A^*$   $\{ w \mid w \in A \text{ or } w \in \beta \}$

$$A^* = \{ \epsilon \} \cup A \cup A \cdot A \cup \dots = \bigcup_{i=0}^{\infty} A^i$$

only  $*$  yields  $(\infty) = \infty$  !!

Stack, unfiltered

$$\Delta = \{a\}$$

$$\Delta^* = \{\epsilon, a, aa, aaa, \dots\}$$

$$= \{a^i \mid i \geq 0\}$$

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$$\Sigma^* = \{\epsilon, \sigma\sigma, \sigma\sigma\sigma, \dots\}$$

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