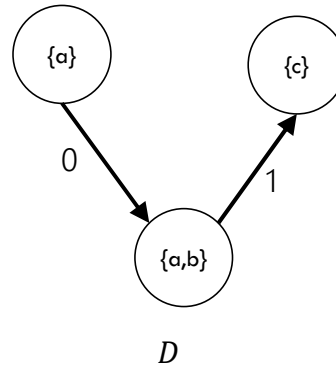
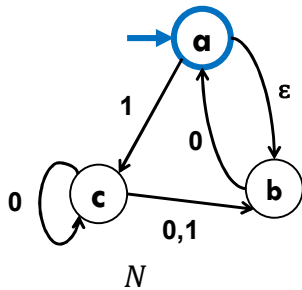


An example (starting point)



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Regular Expressions

Basis:

ϵ is a regular expression. The empty string itself matches the pattern (and nothing else does).

\emptyset is a regular expression. No strings match this pattern.

a is a regular expression, for any $a \in \Sigma$ (i.e. any character). The character itself matching this pattern.

Recursive

If A, B are regular expressions then $(A \cup B)$ is a regular expression matched by any string that matches A or that matches B [or both].

If A, B are regular expressions then AB is a regular expression. matched by any string x such that $x = yz$, y matches A and z matches B .

If A is a regular expression, then A^* is a regular expression. matched by any string that can be divided into 0 or more strings that match A .

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Let $P(A)$ be "There is an NFA whose language is the same as the language for A ." (base cases)

Base Cases:

\emptyset

ε

a ($a \in \Sigma$)

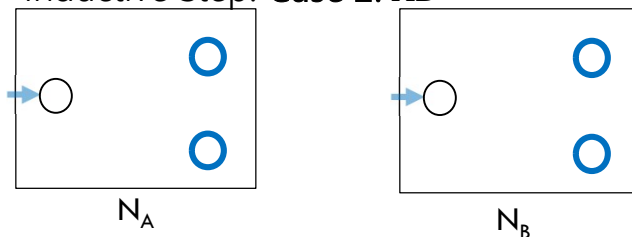
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Let $P(A)$ be "There is an NFA whose language is the same as the language for A ." (concatenation)

Let R be a regex not covered by the base cases. By the exclusion rule, $R = A \cup B$ or AB or A^* from some regexes A, B

Inductive Hypothesis: Suppose $P(A)$ and $P(B)$.

Inductive Step: **Case 2: AB**



Want a machine that accepts exactly strings matched by AB .

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