

Games, graphs, and machines

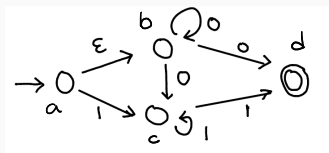


← NFA

why not both?

NFA Acceptance

Is the string 0110 accepted by the following NFA?



Parallel run

$\{a, b\}$

$\downarrow 0$

$\{b, c, d\}$

$\downarrow 1$

$\{c, d\}$

$\xrightarrow{1}$

$\{c, d\}$

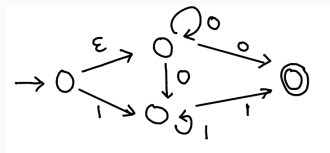
$\xrightarrow{0}$

$\{\}$

NFA Rejection

accepted

Find a few strings not accepted by the same NFA.



$$(0^+ = 0^*0 = 00^*)$$

accepted : $0, 00, 000, \dots, 0^*0, \dots \checkmark$
 $11, 11^*1, \dots \checkmark, 01^*1, \dots$

Not : $0110,$

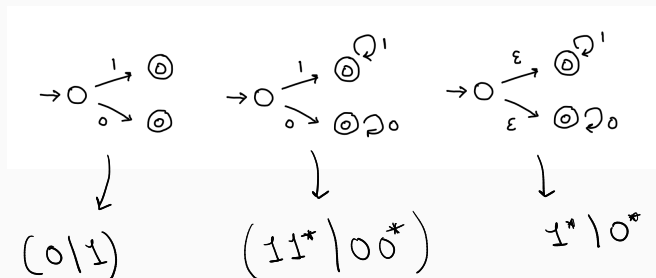
$\epsilon, (011)^*(10)(011)^* \leftarrow \text{maybe.}$

Coming up : convert aut. \rightarrow regex.

NFA Language

What strings are accepted by the following NFAs?

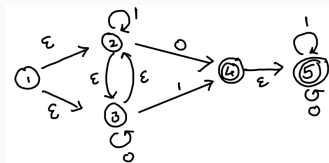
($\text{DFA}_s \subseteq \text{NFA}_s$)



NFA to DFA

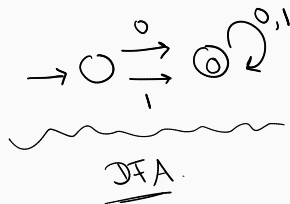
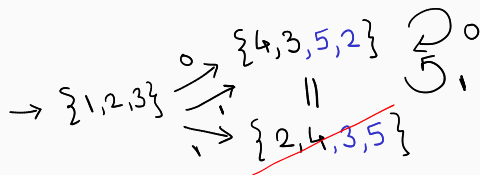
Convert the following NFA to an equivalent DFA.

DO NOT
enumerate all
 ϵ -closed states.



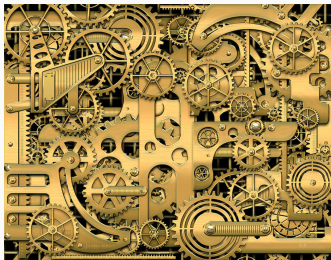
DONE when
every
state has
0 out &
1 out.

1. Write the starting ϵ -closed state
= ϵ -closure {original start} = {1, 2, 3}



Determinism vs non-determinism

Q: Is $P = NP$ or $P \subsetneq NP$?



P
class of feasible problems
with a det.
computer

NP
class of feasible
problems with
non-det. computer