

Push down Automata

A PDA is an FA with a stack added. The FA can use stack for storage.

Example $0^n 1^n$

Idea: use stack to count the zeroes.
Then compare with the ones.

Say use x as stack symbol

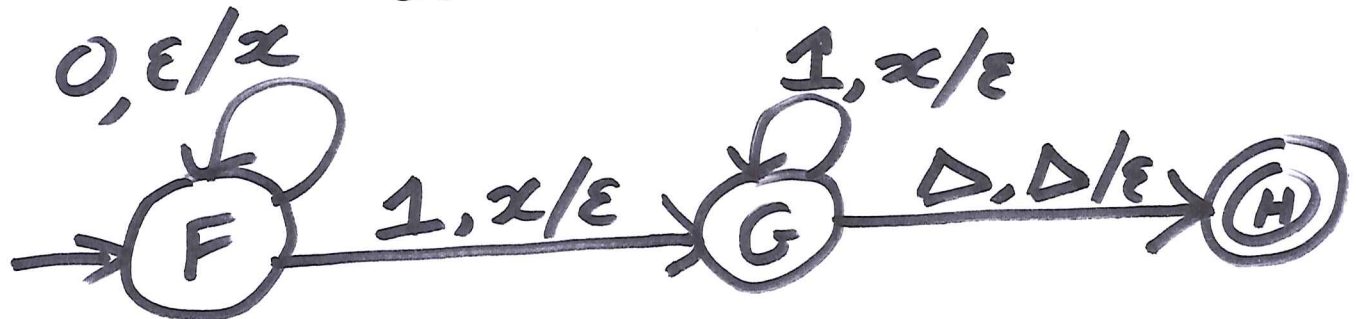
$$\underline{0^1 1^n}$$

In first state:

- if read 0 push x
- if read 1 pop x
& goto second state

In second state:

- if read 1 pop x
- if read end-of-string
check stack-is-empty
& Accept.



Note if no valid continuation,
machine dies.

Example:

Strings of a's and b's such that every initial segment has at least as many a's as b's.

initial segment = substring starting at beginning

e.g. a a b b a

Need 1 state:

- if read a, push
- if read b, pop
- if read Δ , ~~check~~ accept