Faculty of Mathematics and informatics
Computer science department
Level: L2
Course: Theory of computation
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5th Practical Series

Push Down Automata

Let $A = \{a, b\}$ be an alphabet, and Let L=$\{a^n b^n, n \in N\}$ be a language on A

As we have proved, in ours course this language is not regular, in other words, we cannot use the finite automata to recognize it,

This language is a context-free language, because it exists a context free grammar that generates it: $G = (N, T, S, P), N = \{S\}, T = \{a, b\}, P = (S \rightarrow aSb|\varepsilon)$, an alternative solution is used through the Push Down Automata(PDA), which is a 7-tuples:

$M = (Q, \Sigma, S, \delta, q0, Z0, F)$
Q : finite set of states.
Σ : input alphabet
S : stack symbols
δ : transition function $Q \times (\Sigma \cup \{\varepsilon\}) \times S \rightarrow Q \times S^*$
$q0 \in Q$: *initial state*
$z0 \in S$: initial stack top symbol
$F \in Q$: set of accepting states.

- Build a Push Down Automaton that recognizes L(G)
- Show the acceptance sequence on the few given words (examples) by the PDA.
    - By final state, then by empty stack acceptability.