Finite state machines

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Introduction

- Let's consider some alphabet Σ.
- We can create words. Set of all word is Σ^*
- We want to know if some word is part of some language $A \subseteq \Sigma^*$

Finite state machine - Definition

- Abstract machine
- Takes word as an input and returns some state
- Can be used to recognize some classes of languages

Important classes of languages

Regular languages

- Language defined by regular expression
- Regular languages are closed under certain operations

Context-free languages

- Language defined by context-free grammar
- Context-free languages are closed under certain operations

DFA

- It is a tuple $< Q, \Sigma, \delta, q_0, F >$
- Can recognize regular languages

NFA

- Similarly to DFA, it is a tuple $< Q, \Sigma, \delta, q_0, F >$
- Can recognize regular languages

PDA

- It is a tuple $< Q, \Sigma, \Gamma, \delta, q_0, F, Z >$
- Can recognize context-free languages

Summary

- Finite-state machines can help recognizing languages
- There are some interesting classes of languages
- FSMs can recognize languages from these classes

The End

Thank you for your attention