Finite automata

Reduction of one problem to another

Diagonalization

Nondeterminism

Interweaving

Finite automata

Nondeterministic finite automata

Conversion nfa to fa

Sets accepted by finite automata are called regular sets

Not all sets are regular

Class of regular sets closed under complement.

Epsilon moves, multiple start states, restricting to one final state.

Regular expressions

The class of sets denoted by regular expressions is the class of set defined by finite automata.

Closure properties of class of regular sets

Machine constructions

Homomorphisms and inverse homomorphisms

Operations like shuffle

Minimizing states in fa.

Pumping lemma for regular sets

Decision procedures

Interesting fa

Context-free languages

cfl's properly contains regular sets

cfl's defined by error in string

pda's

acceptance by final state and by empty store define same class of languages

reduction of many state to one state

one state equivalent to cfl's

machine construction for intersection with regular sets

normal forums: eliminate useless variables, epsilon productions, singleton productions

Chomsky normal forum

Pumping lemma for cfl

Closure properties

Decision properties

Dynamic programming applied to membership problem