



MINIMALITY PROBLEMS FOR PROMISE VERSIONS OF FINITE AUTOMATA

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WHAT IS A PROMISE PROBLEM

- Generalization of formal languages
- $P=(P_{\text{yes}},P_{\text{no}})$
- 2 modes of acceptance:
 - Solving
 - Recognizing



RECOGNIZING MODE

- Introduced in [9]
- Promise version deterministic finite automata (pvDFA)
 - 3 types of states:
 - Accepting
 - Rejecting
 - Neither accepting nor rejecting

$$sr(P) \leq s(P_{\text{yes}}) s(P_{\text{no}}) - 1$$



SOLVING MODE I.

1. promise problems that can be recognized by a pvDFA
2. Promise problems whose yes and no components are CFL
3. Promise problems whose yes and no components are recursive
4. Promise problems that can be solved by a DFA



SOLVING MODE II.

- Does given DFA solve given promise problem?
- Exists an algorithm that finds minimal DFA solving a given promise problem?
- Can given promise problem be solved by a DFA?

	DFA	PDA	TM	Can be solved
Solves DFA given problem?	✓	✓	✗	✗
Minimization	✓		✗	
Can problem be solved by DFA?	✓		✗	

