Minimizing deterministic finite automaton

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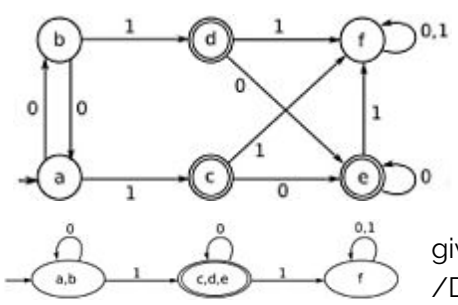
Minimizing deterministic finite automaton



(//wikipedia.org /wiki/File:Minimized DFA.jpg)

Equivalent minimal DFA. Nondistinguishable states have been joined into a single one.

In automata theory (/topic/Automata theory&item_type=topic) (a branch of computer science (/topic/Computer science&item_type=topic)), **DFA minimization** is the task of transforming a given deterministic finite automaton (/topic /Deterministic finite automaton&item_type=topic) (DFA) into an equivalent DFA that has a minimum number of states. Here, two DFAs are called equivalent if they recognize the same regular language (/topic/Regular language&item_type=topic). Several different algorithms accomplishing this task are known and described in standard textbooks on automata theory.[1]

Minimum DFA

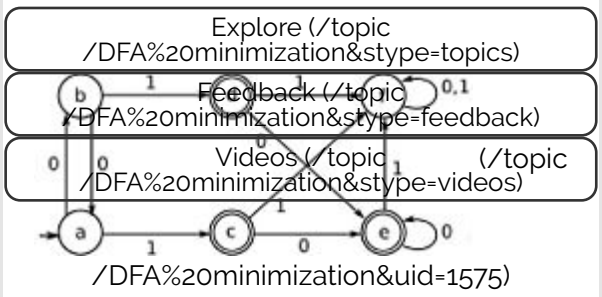
For each regular language that can be accepted by a DFA, there exists a **minimal automaton**, a DFA with a minimum number of states and this DFA is unique (except that states can be given different names.)[2] The minimal DFA ensures minimal computational cost for tasks such as pattern matching.

There are two classes of states that can be removed/merged from the original DFA without affecting the language it accepts to minimize it.

- **Unreachable states** are those states that are not reachable from the initial state of the DFA, for any input string.
- **Nondistinguishable states** are those that cannot be distinguished from one another for any input string.

Topic

DFA minimization (/topic /DFA%20minimization&uid=1575)



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Equivalent minimal DFA. Nondistinguishable states have been joined into a single one. In automata theory (a branch of computer science), DFA minimization is the task of transforming a given deterministic finite automaton (DFA) into an equivalent DFA that has a minimum number of states. Here, two DFAs are called e... *More...*

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Topic

Deterministic finite automaton (/topic

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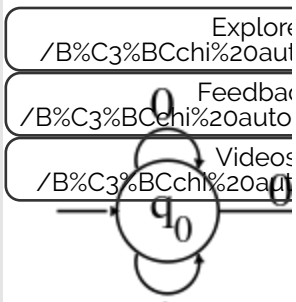

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In computer science a Büchi automaton is ω-automaton , which automaton to infinite infinite input sequenc of the automaton tha of the final states infi automata recognize l languag...

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