Why does so few of you solve state minimization tasks?

We're just showing that there exists state minimization, and present a simple method that can be applied to small state diagram.
State table

Initial state diagram

Initial state table
Is state minimization difficult?

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Kindergarten version …

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Done!

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Minimal number of states.

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Minimized state diagram

<table>
<thead>
<tr>
<th>Present state</th>
<th>Nextstate</th>
<th>Output</th>
<th>z</th>
</tr>
</thead>
<tbody>
<tr>
<td>A'</td>
<td>B C'</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>A' F</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>C'</td>
<td>F C'</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>F</td>
<td>C' A'</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

4 states needs 2 flip-flops ($2^2 = 4$).
More on state minimization in "Data Structures and Computer Algorithms"

- This method, (Moore 1956). State minimization of \( n \) states – runtime on computer is \( \propto n^2 \)

- Hopcroft’s algorithm (1971) – runtime on computer \( \propto n \cdot \log_2(n) \)

numerical Example: 100 states.

\[
100^2 = 10000 \\
100 \cdot \log_2(100) = 650
\]

Computer programs on the Internet must be scalable, they can ”overnight” become very popular - and run the risk of overloading the servers!

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