

Converting a DFA to Regular Grammar

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1 DFA to Regular Grammar

In this exercise we use JFLAP to convert a given DFA to a regular grammar. The DFA that we use as our example is shown in Figure 1. Input this DFA into JFLAP or load the file DFA1.jff.

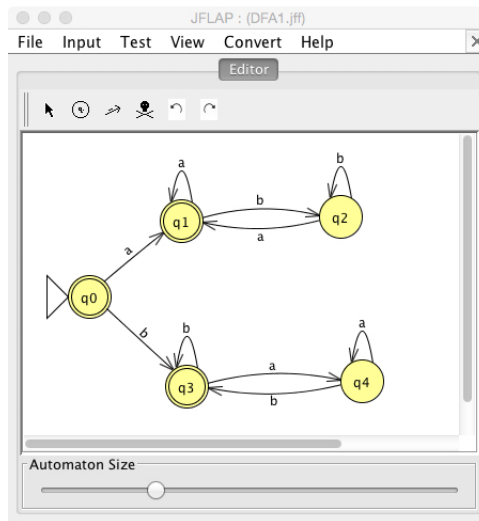


Figure 1: Input DFA

The algorithm to convert a DFA to a regular grammar is straightforward. We create a variable for each state. The variable corresponding to the initial state is the start variable, S . For each transition from state X to state Y with label x , we create a production $X \rightarrow xY$. For each final state X we create a production $X \rightarrow \lambda$.

Select Convert to Grammar. JFLAP gives you a window with the DFA and a panel on the right for productions. As you click each final state, a corresponding production is listed. As you click each transition, a corresponding production is again listed. You can click on “What’s Left” to find out what transitions remain to be processed. Repeat this as many times as necessary to obtain the Grammar shown in Figure 2.

Why does this give a grammar that generates the same language as that generated by the corresponding DFA?

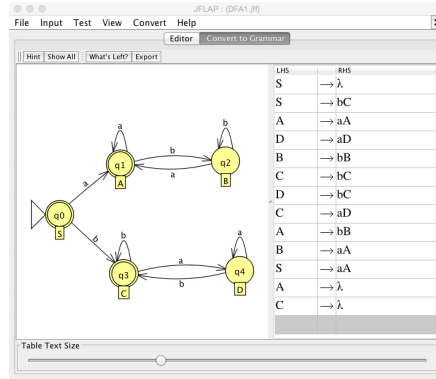


Figure 2: Input Regular Grammar

2 References

1. JFLAP - An Interactive Formal Languages and Automata Package, Susan H. Rodger and Thomas W Finley. Jones and Bartlett Publishers. 2006