

Moore Machine – Exercise

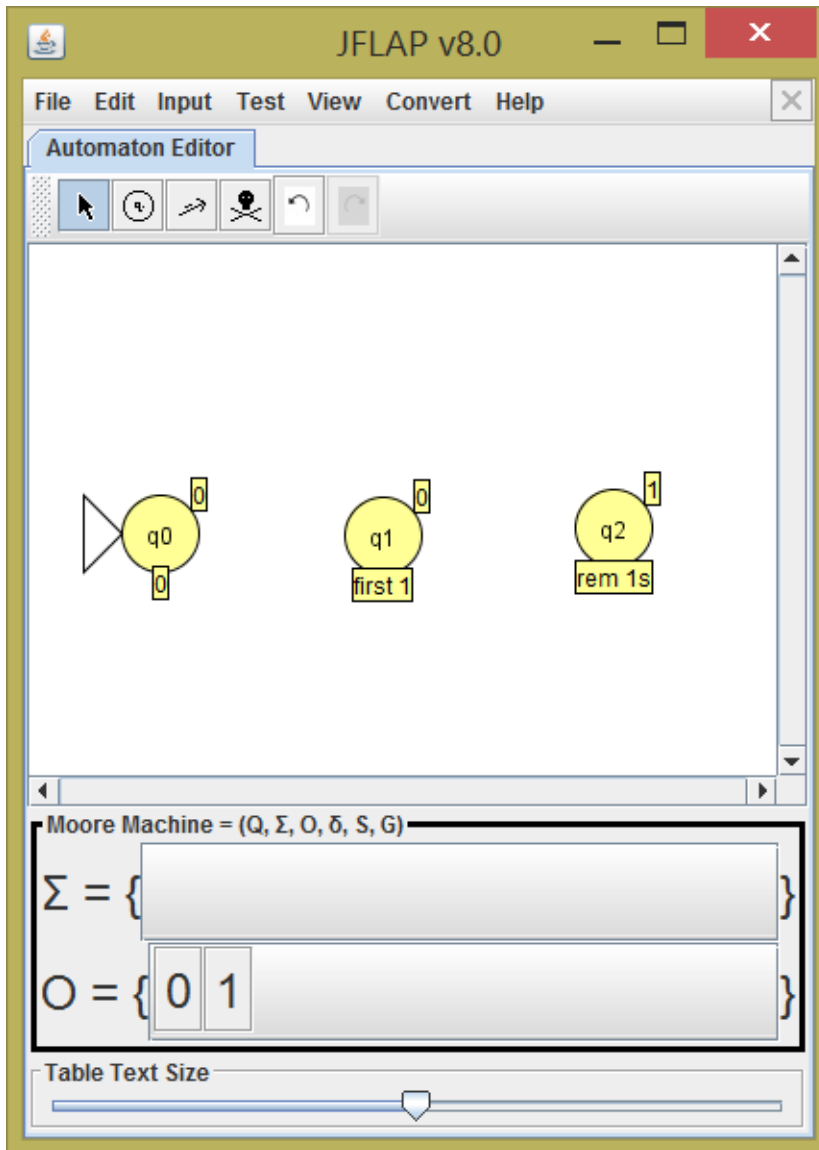
Problem:

Construct a Moore machine which takes a binary number and replaces the first 1 with a 0 from every substring starting with 1. For example, 0001001110 becomes 0000000110. This type of “bit stuffing” may be used in data transmission and telecommunications for run-length coding to limit the number of consecutive bits of the same value. A bit of the opposite value is inserted after the maximum allowed number of consecutive bits.

Solution:

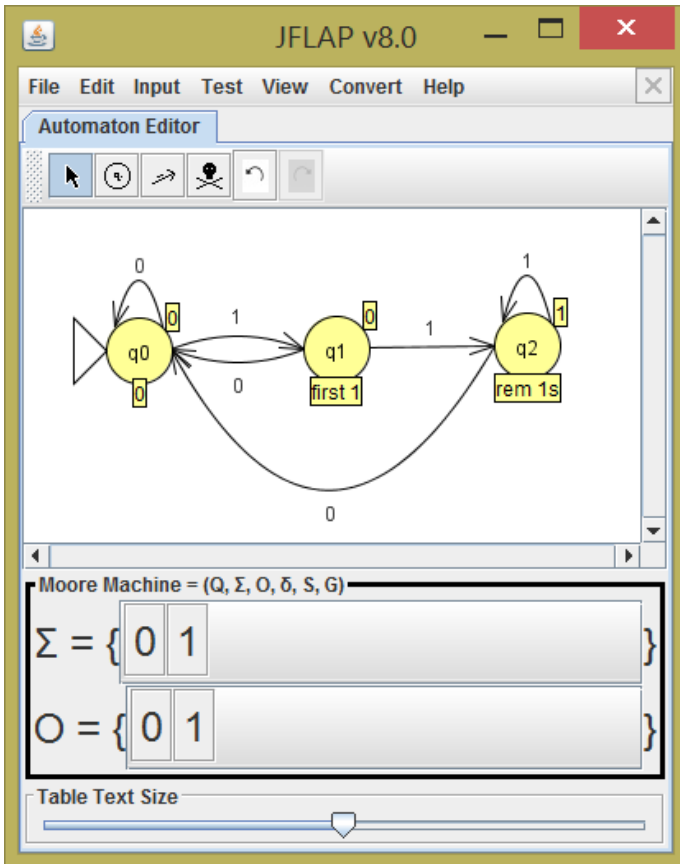
Open JFLAP and create a Moore machine with an initial state. Create three states as follows:

1. q_0 with an output of 0 to represent a 0 read.
2. q_1 with an output of 0 to represent the first 1 read within a substring of 1s.
3. q_2 with an output of 1 to represent the remaining 1's read after the first 1 was read.



Next, add the transitions:

1. At q_0 and an input of 0, stay at q_0 .
2. At q_0 and an input of 1, go to q_1 .
3. At q_1 and an input of 0, go back to q_0 .
4. At q_1 and an input of 1, go to q_2 .
5. At q_2 and an input of 0, go all the way back to q_0 .
6. At q_2 and an input of 1, stay at q_2 .



The Moore machine is complete, run some test strings using *Input > Multiple Runs*.

