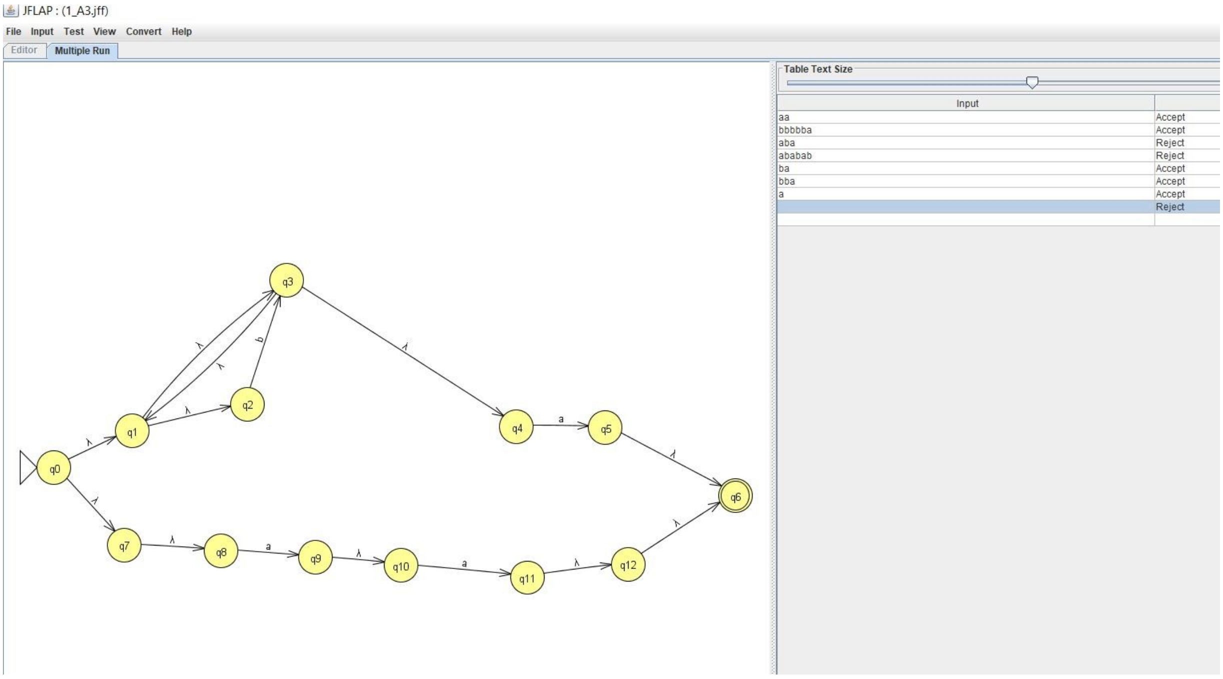
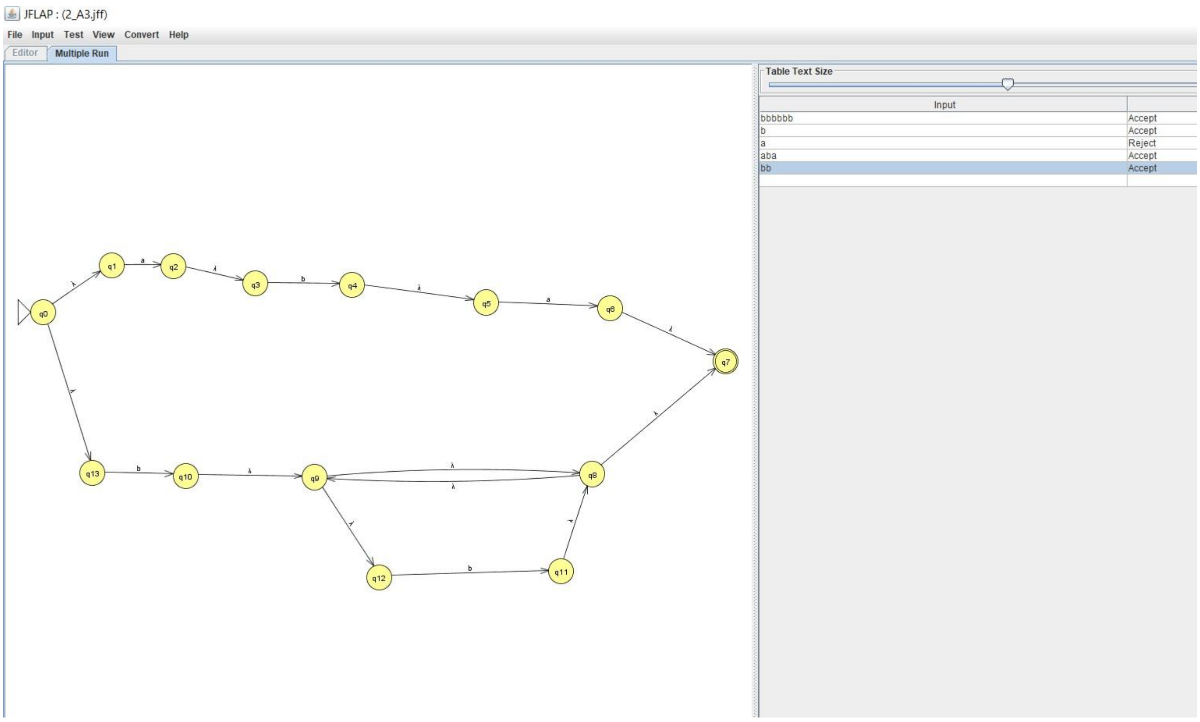
1. Create an nfa for Σ = {a, b} that accepts the language L (aa + b*a).



2. Create a regular expression for the set of all strings that consist of an odd number of 'a's followed by 'bb' (for example "abb", "aaabb", "aaaaabb", etc.).

Solution: (aa)*abb

3. Use the construction in Theorem 3.1 to create an nfa that accepts the language L(bb* + aba).



4. Create a regular expression for the language accepted by the following nfa:
states: {q0,q1,q2,q3}

input alphabet: {a,b}

initial state: q0

final states: {q2}

transitions:

$\delta(q3,b) = \{q2\}$

$\delta(q1,b) = \{q1\}$

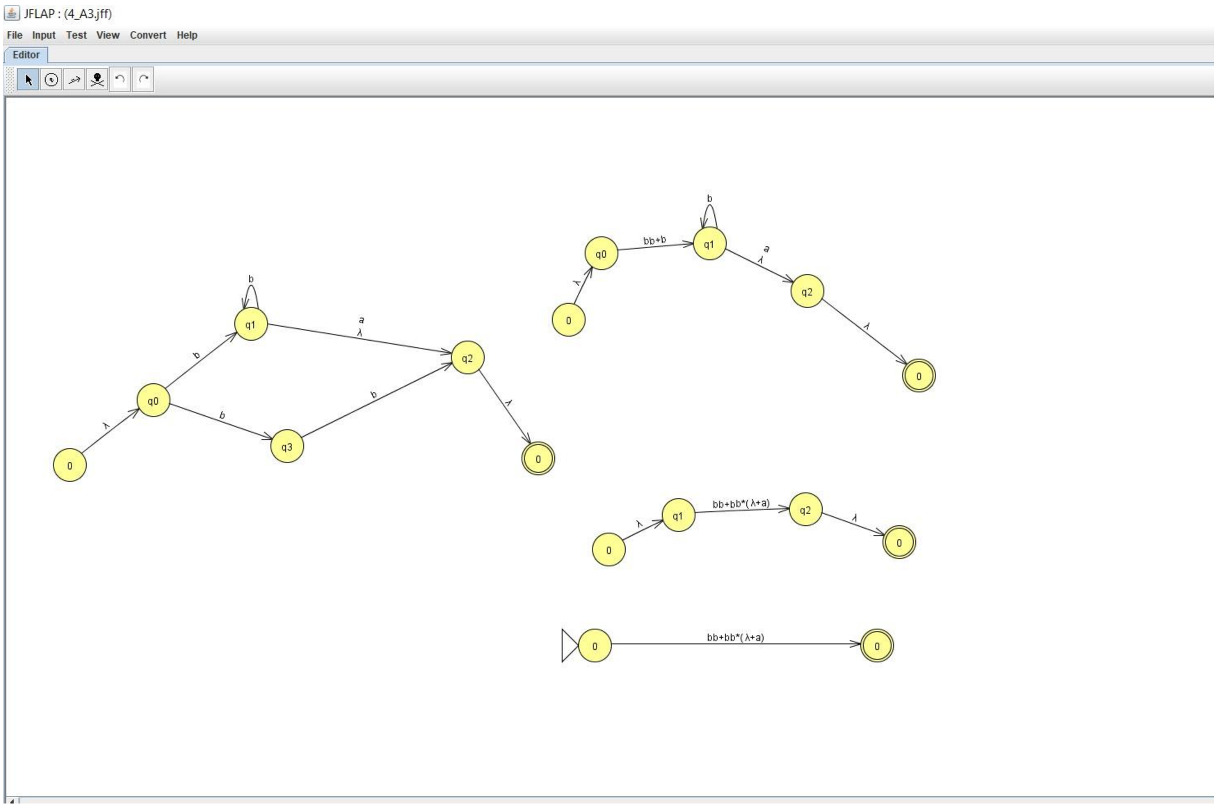
$\delta(q1,\lambda) = \{q2\}$

$\delta(q1,a) = \{q2\}$

$\delta(q0,b) = \{q3,q1\}$

Solution:

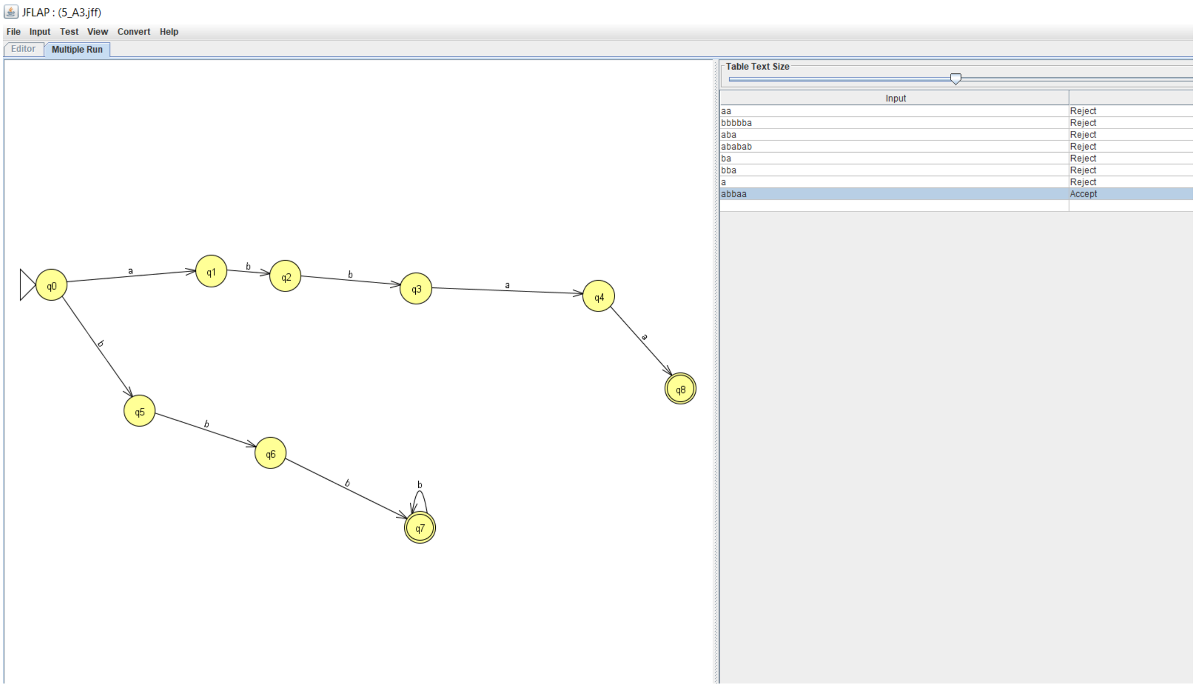
bb + bb*(λ + a)



5. Create a nfa for Σ = {a, b} that accepts the language generated by the following right-linear grammar:
S -> abbA|bbB

A -> aa|a

B -> bB|b



6. Construct a right-linear grammar for the language L ((a + b)*).

Solution: Consider the right linear grammar. Here we have
S->aS
S->bS
S-> λ

Hence, we have the right linear grammar as S -> λ | aS | bS