

Automaadid elus

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(TÜ Arvutiteaduse Instituut)

⌘ Pealeht

⌘ Moodle

⌘ Bitbucket

⌘ Projekt

⌘ Materjalid

⌘ Töövahendid

⌘ Reeglid

⌘ Viited

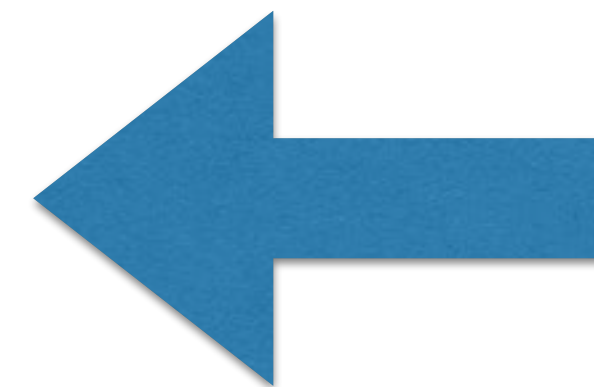
Viited

Raamatud

- Introduction to Compiler Design. *Torben Mogensen*.
 - Õpiku veebileht.
- Compiler Design: Syntactic and Semantic Analysis. *Rein*
- Compilers: Principles, Techniques, and Tools. *Alfred V. A*
- Teoreetiline informaatika: Loengukonspekt (PDF). *Jaan*

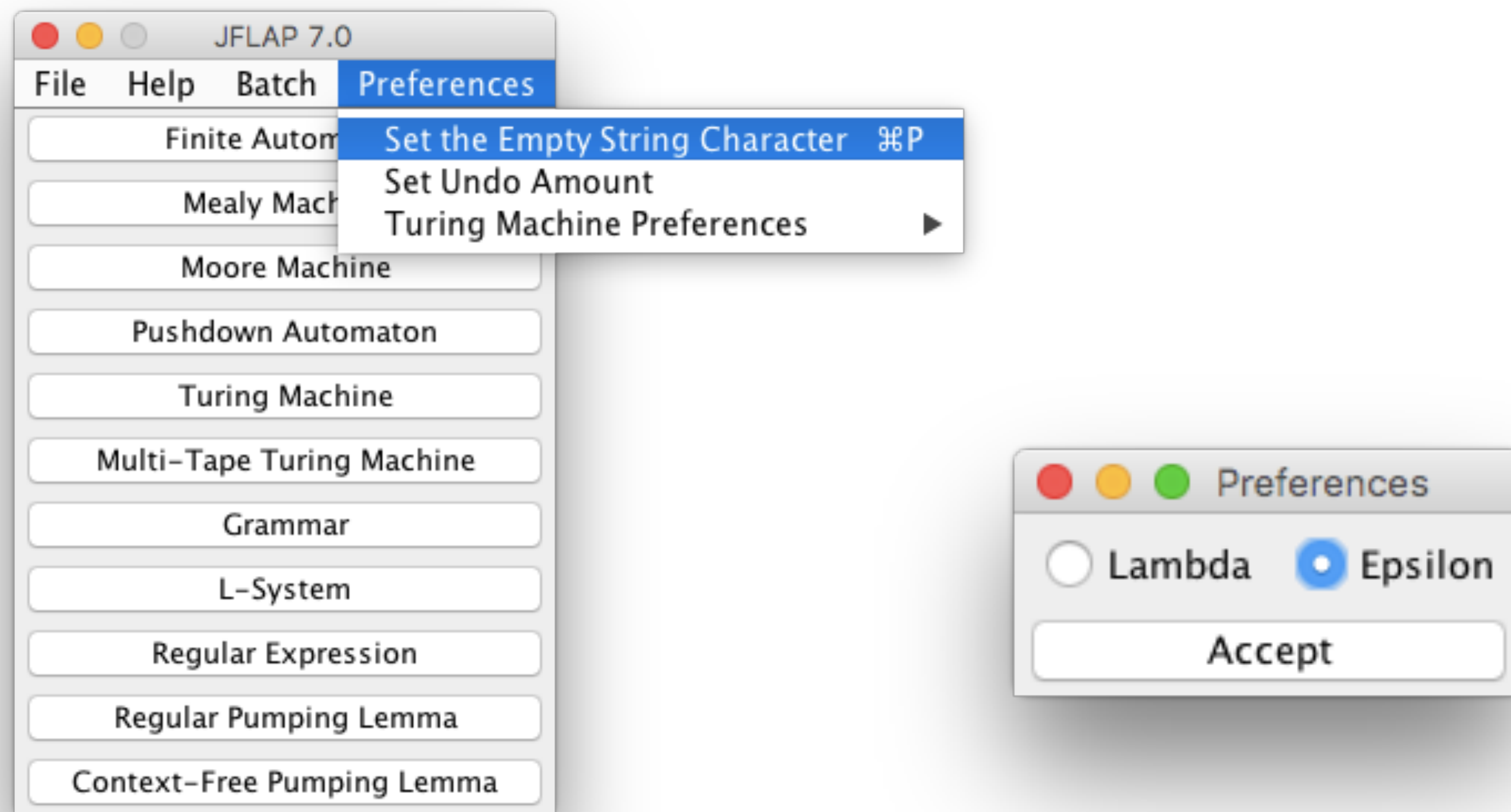
Töövahendid

- JavaREPL
- Regex 101
- jflap (kohalik)



Abivahend: JFLAP

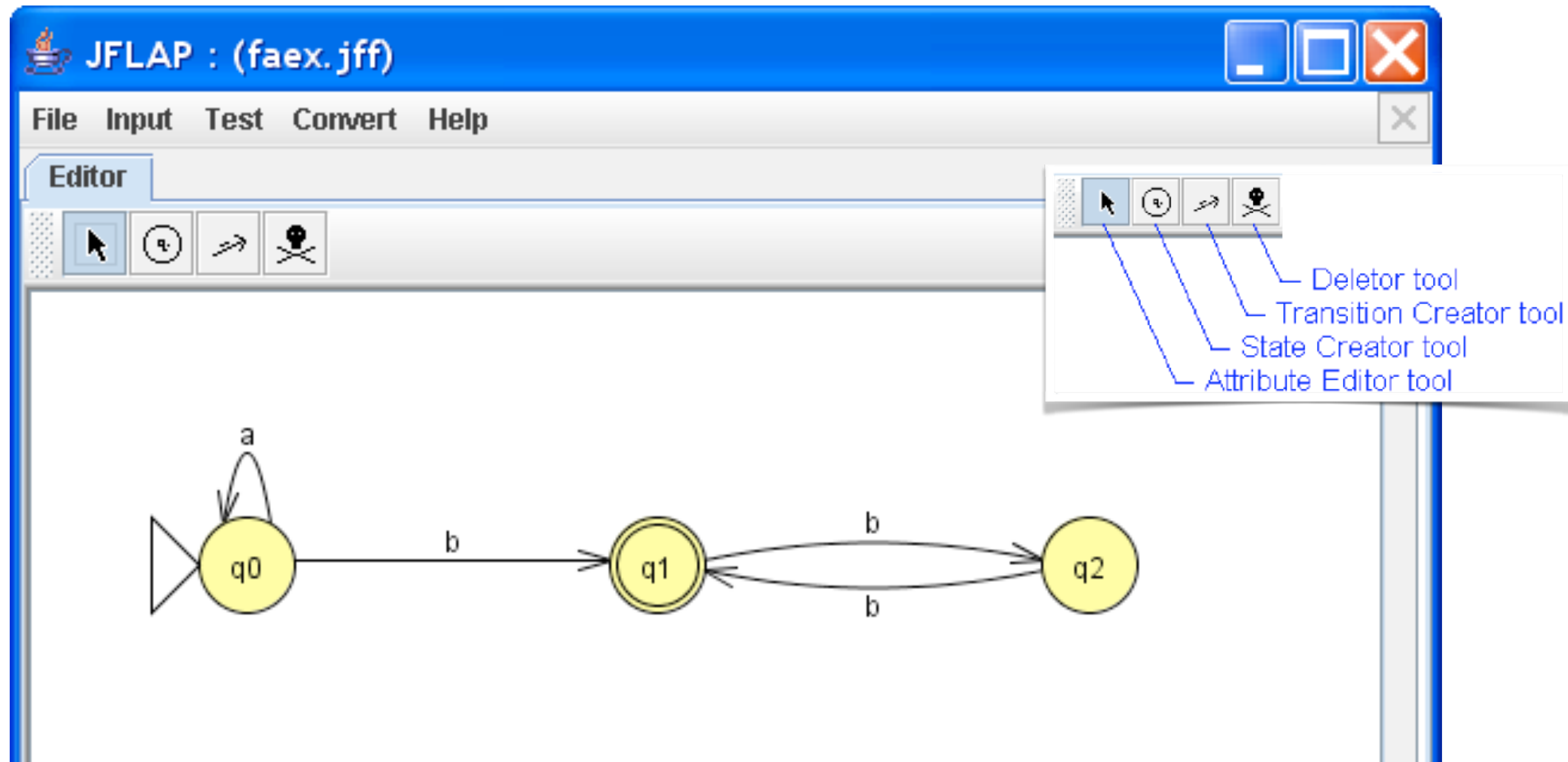
<https://courses.cs.ut.ee/2017/AKT/spring/Main/Links>



Tühja sümboli tähis

Regulaaravaldises kasutame ϵ epsiloni sisestamiseks

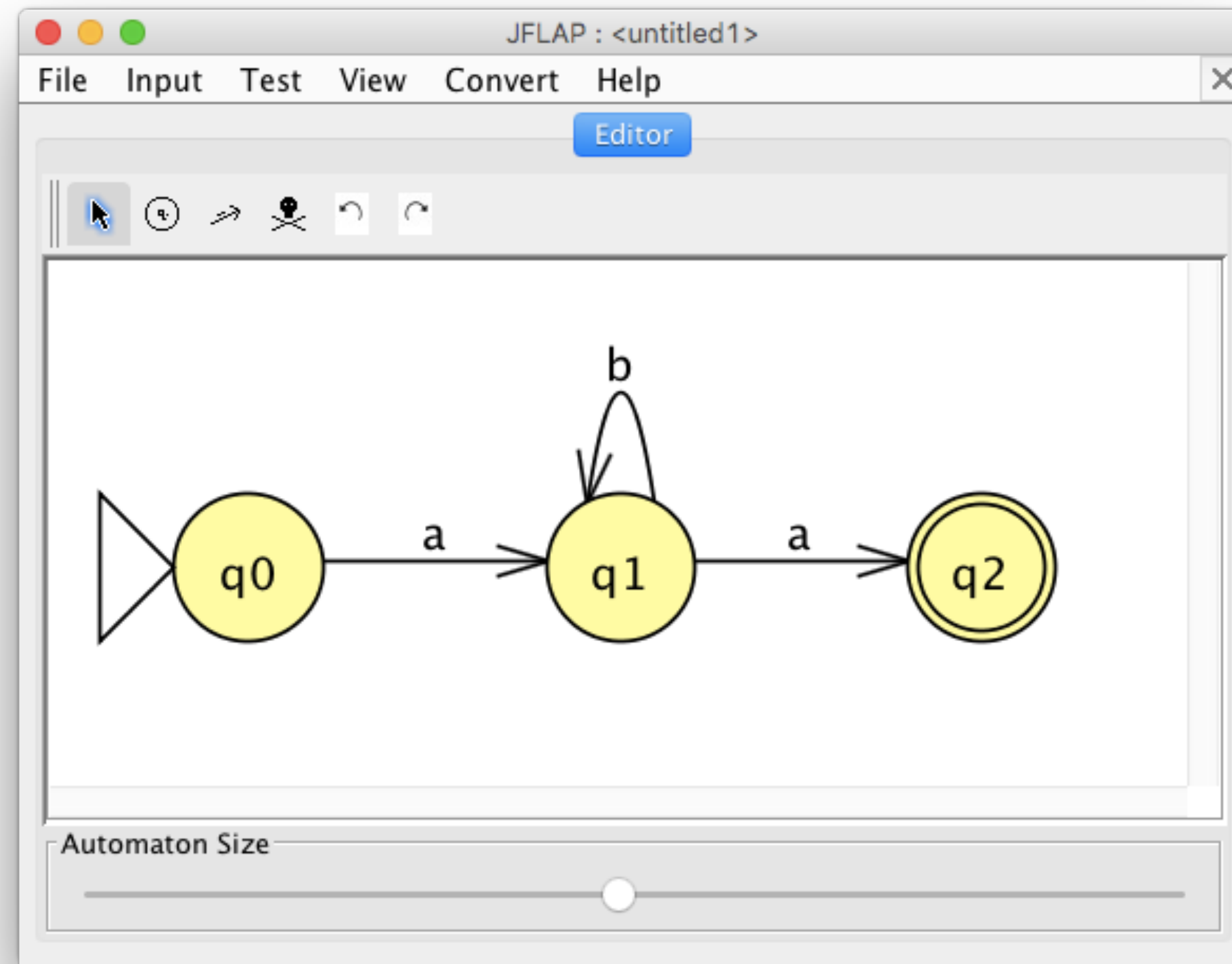
Valiku tähis on $|$ asemel $+$



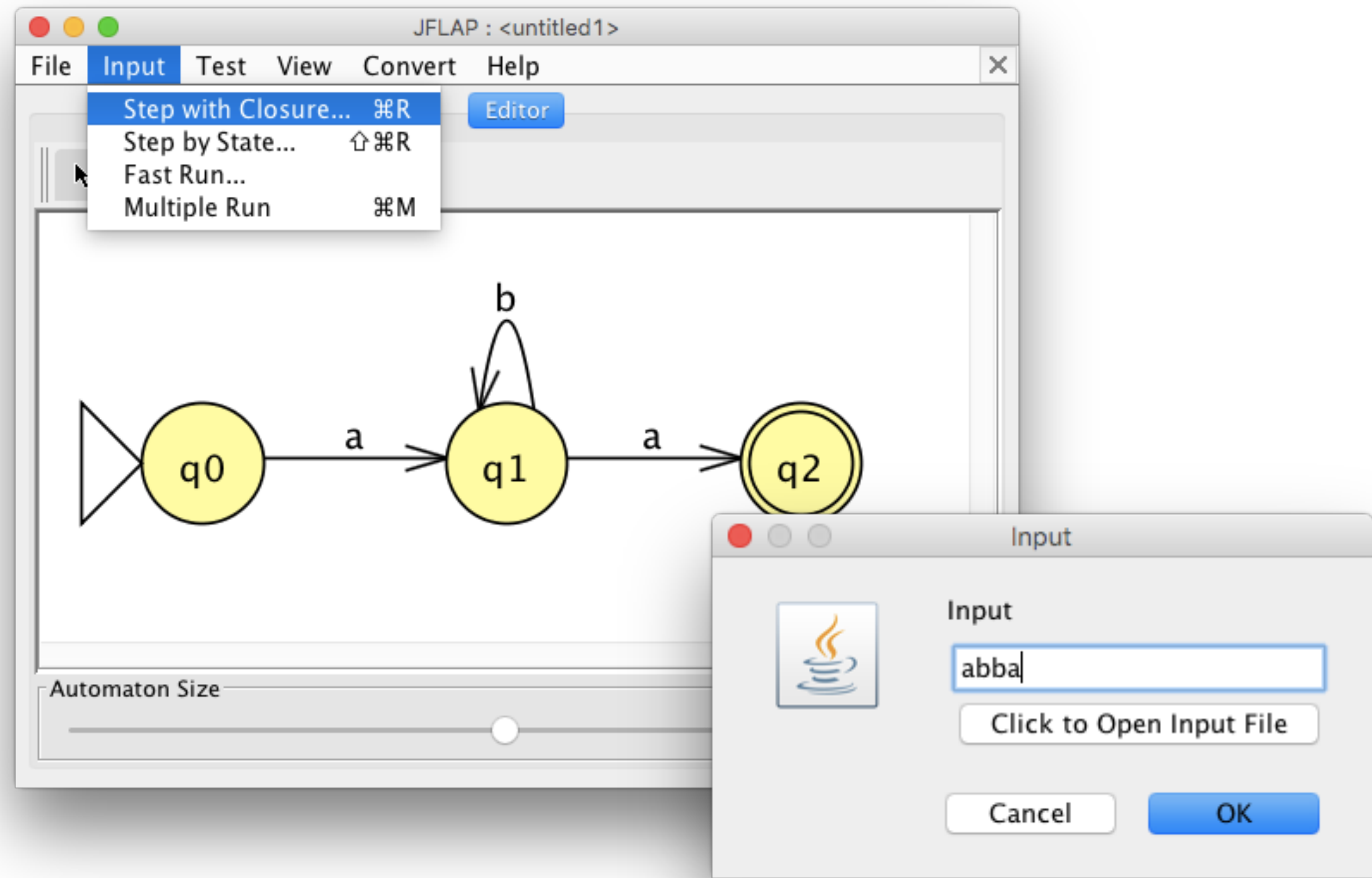
Tutorial!

<http://www.jflap.org/tutorial/>

<http://www.jflap.org/tutorial/fa/createfa/fa.html>

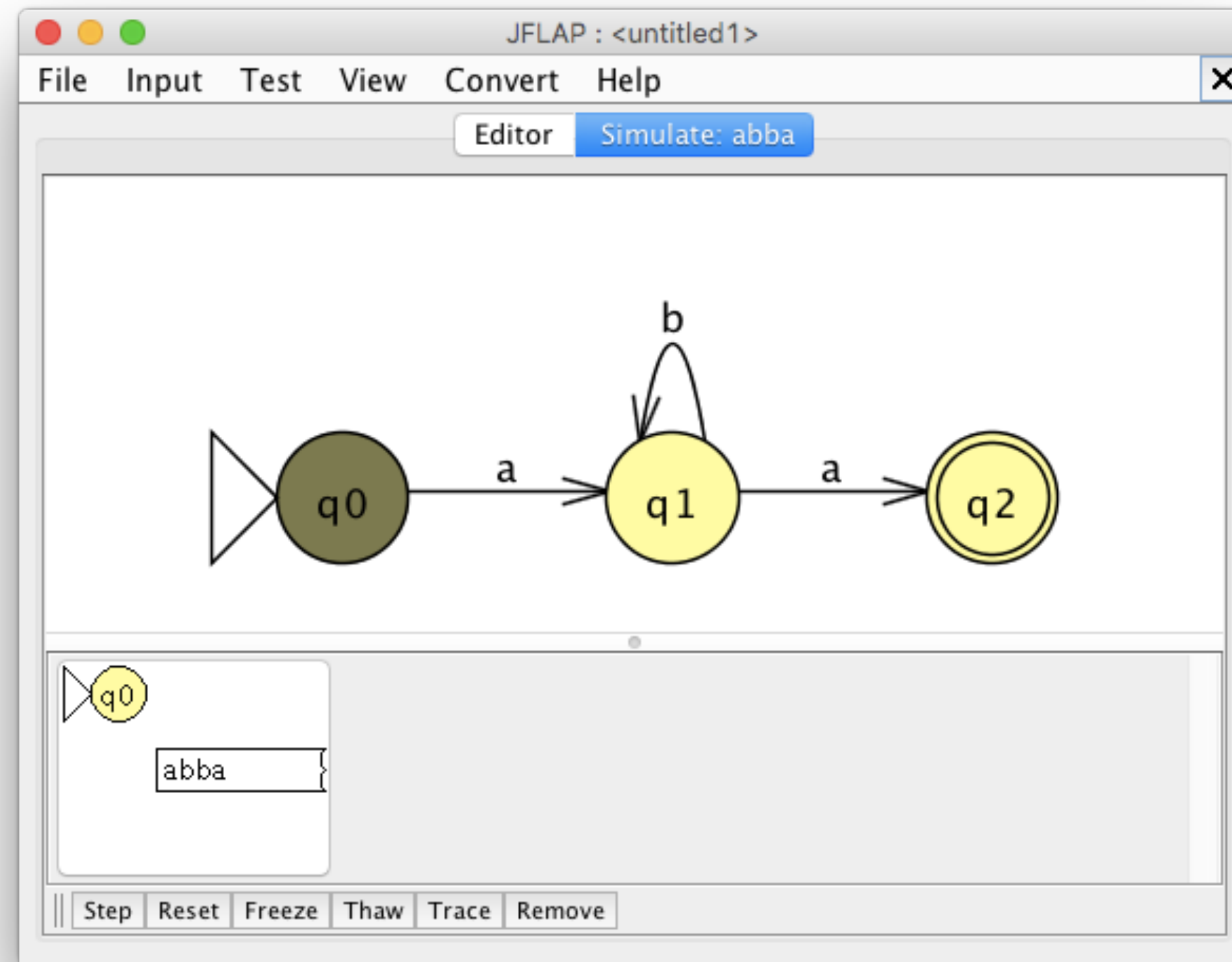


ab^*a automaat



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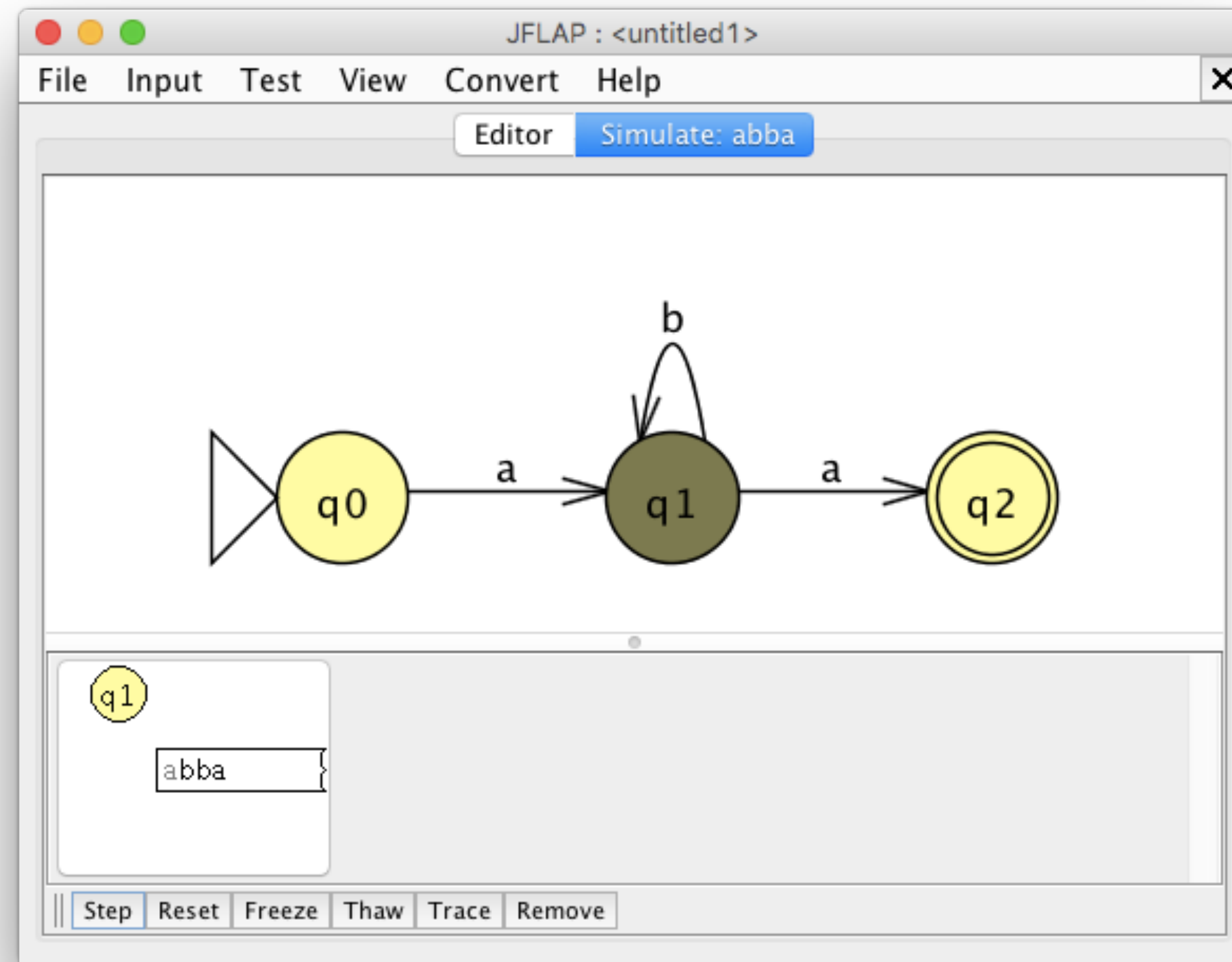
Käivitame sõnega "abba"



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Järgijäänud sõne: "abba"

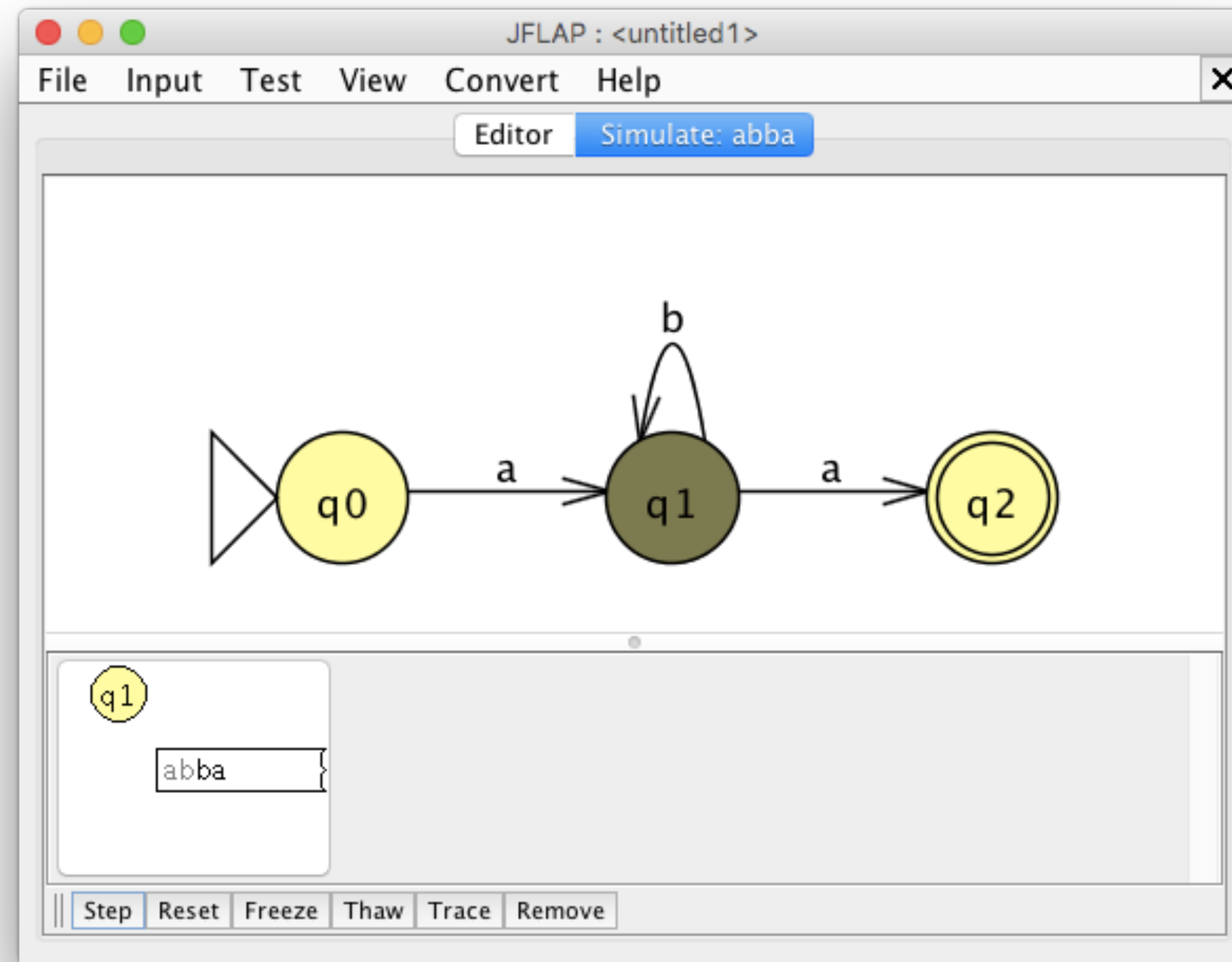
Olek: q_0 (algolek)



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Järgijäänud sõne: "bba"

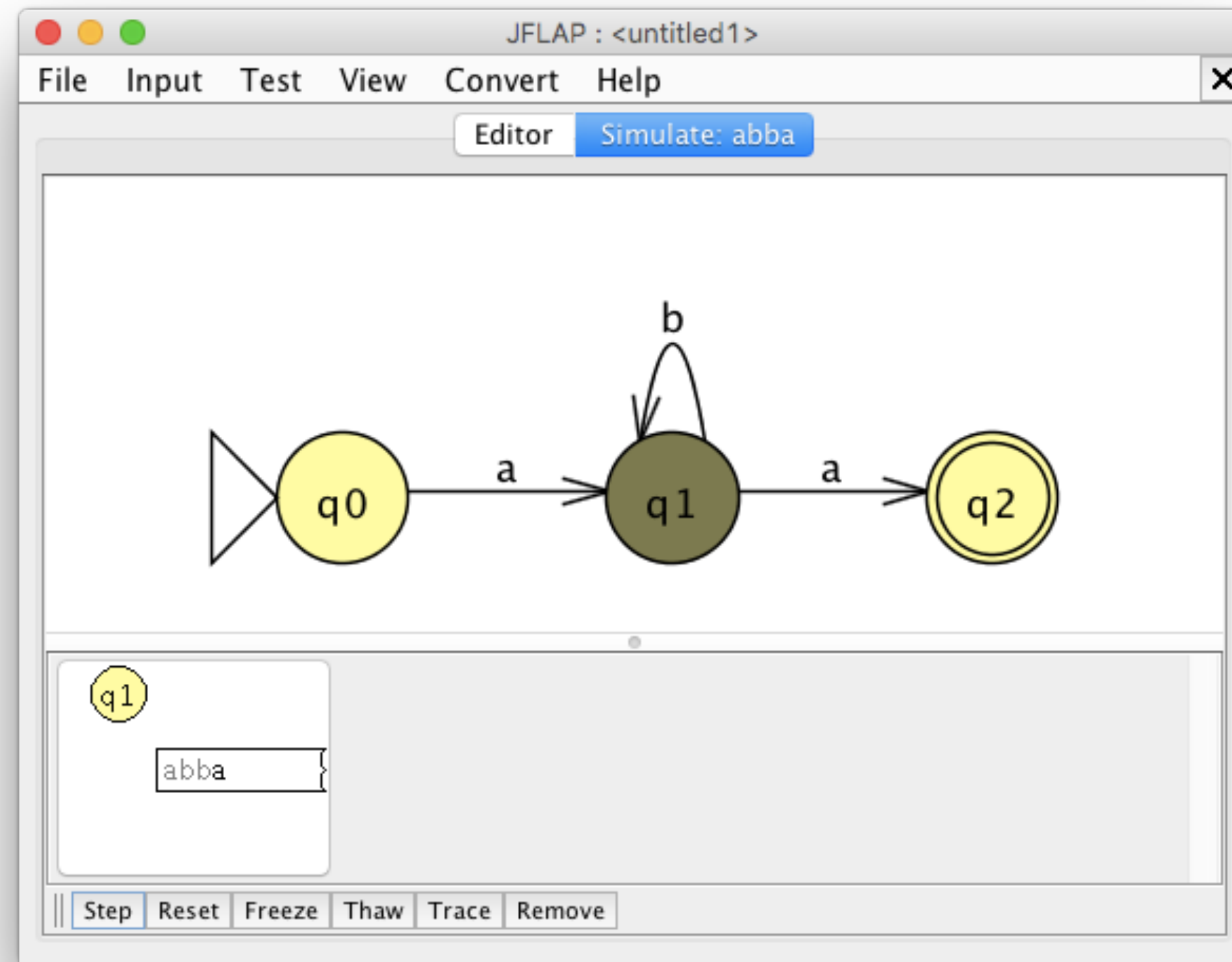
Olek: q1



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Järgijäänud sõne: "ba"

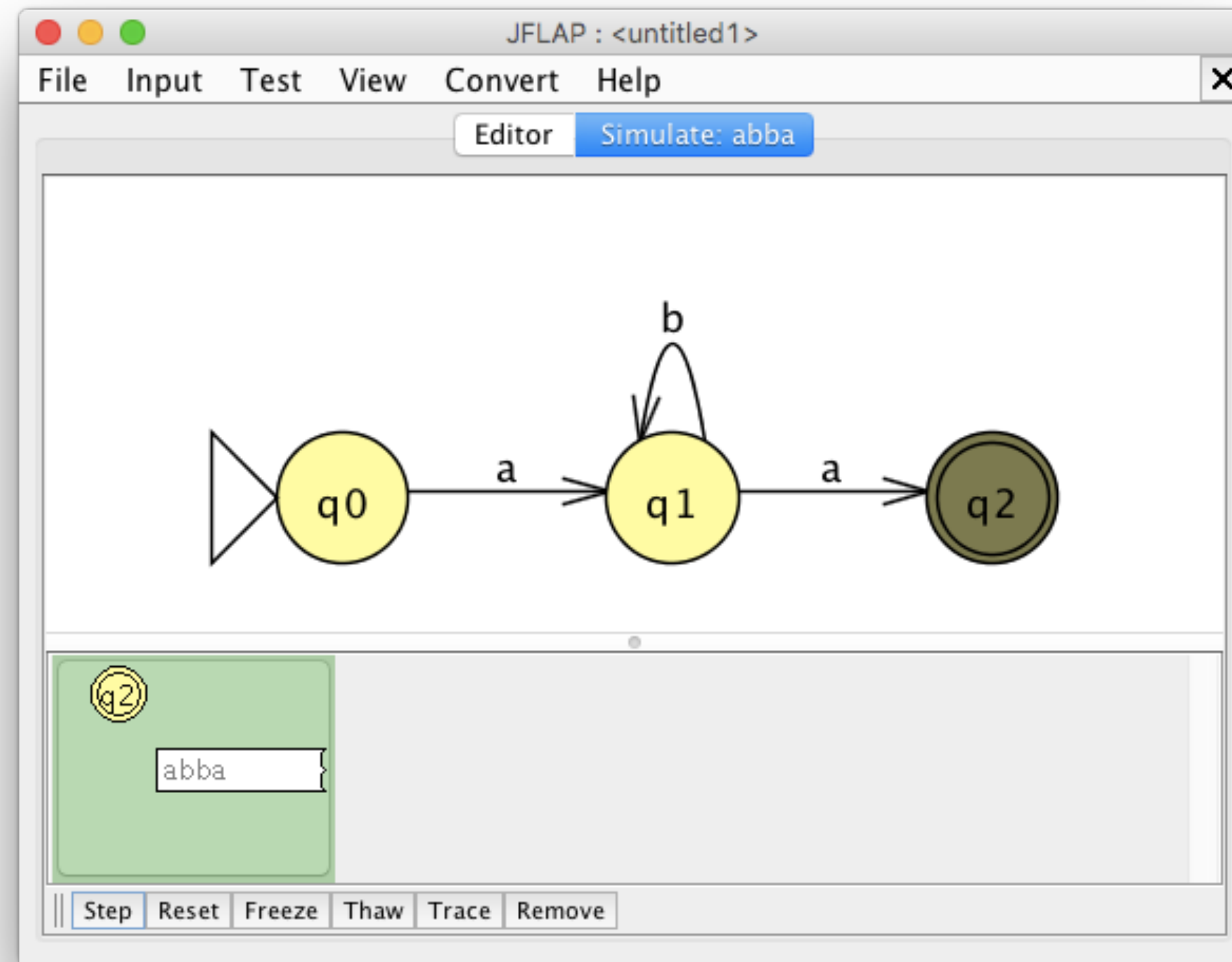
Olek: q1



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Järgijäänud sõne: "a"

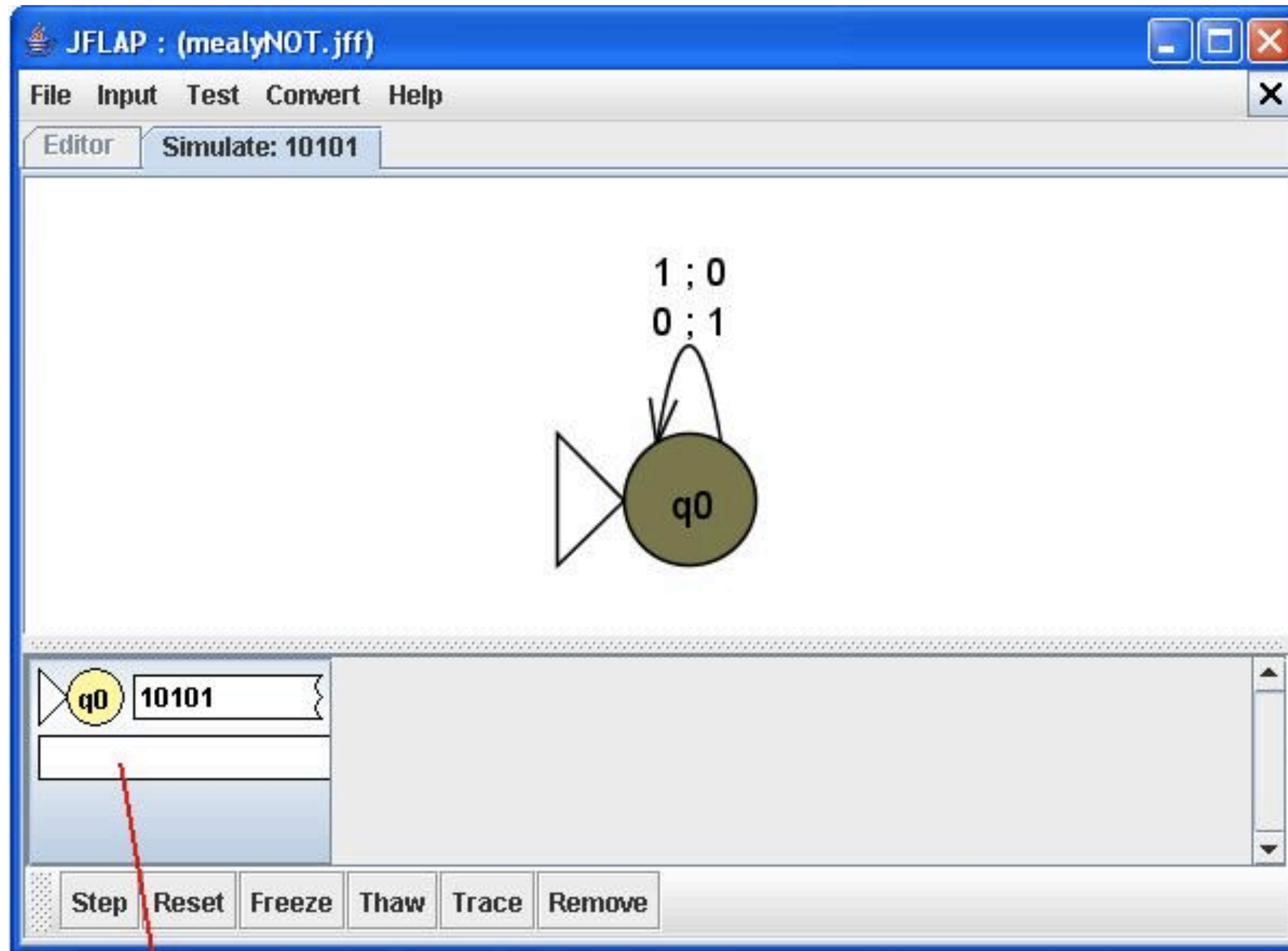
Olek: q1



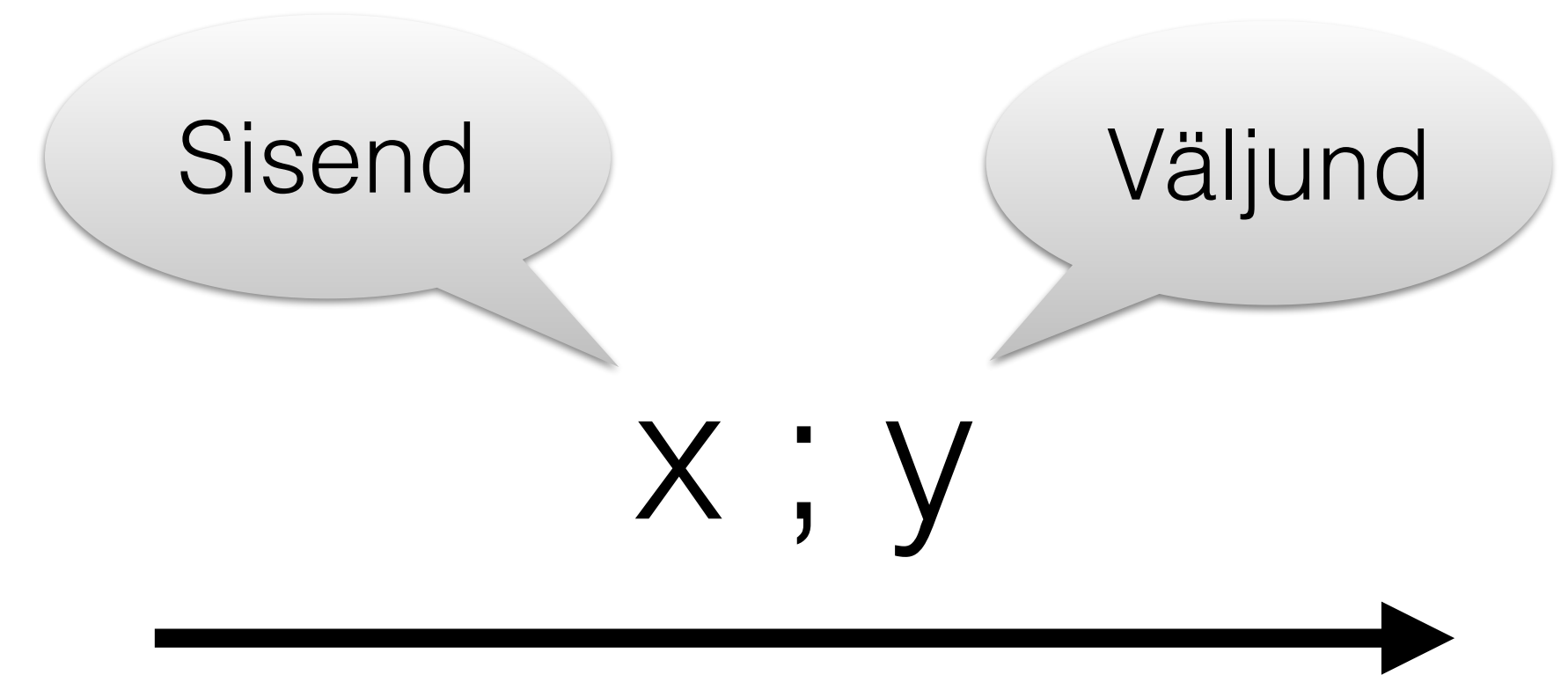
ab^*a automaat

Järgijäänud sõne: ""

Olek: q_2 (lõppolek!)

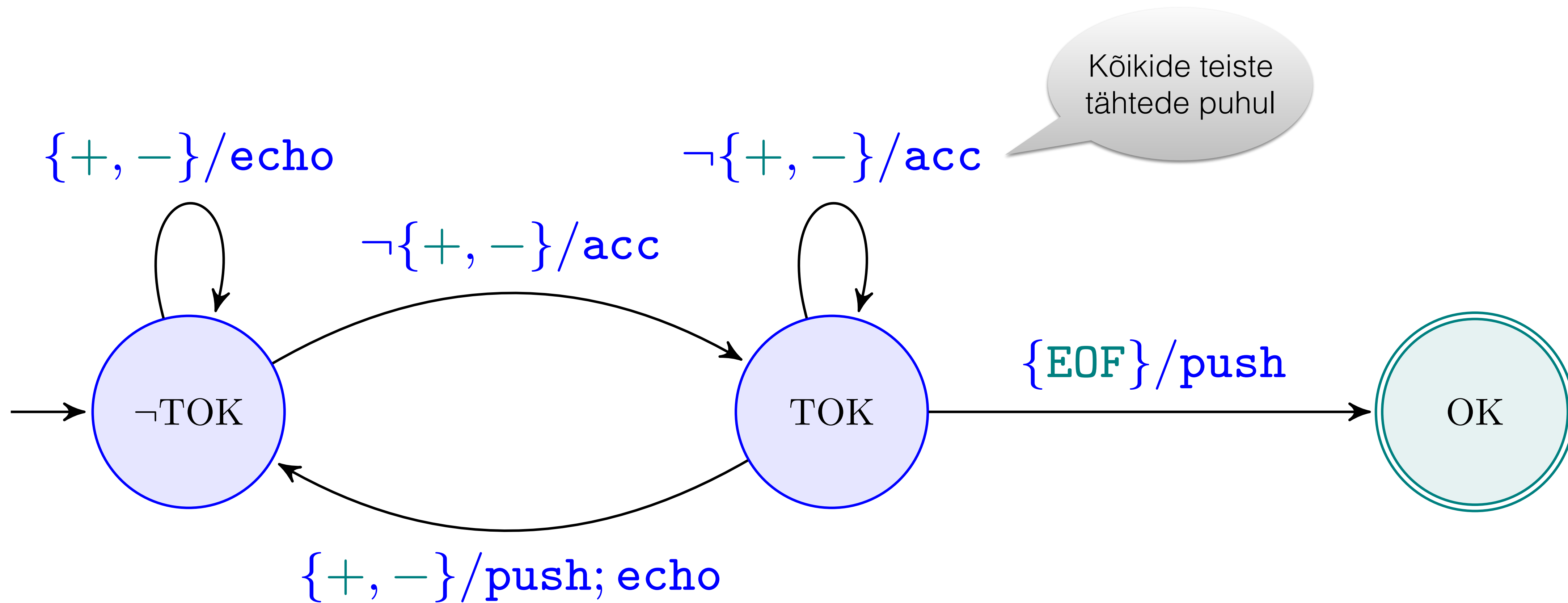


output display



Mealy Masin

<http://www.jflap.org/tutorial/mealy/mealyMachines.html>



Tokeniseerimise näide

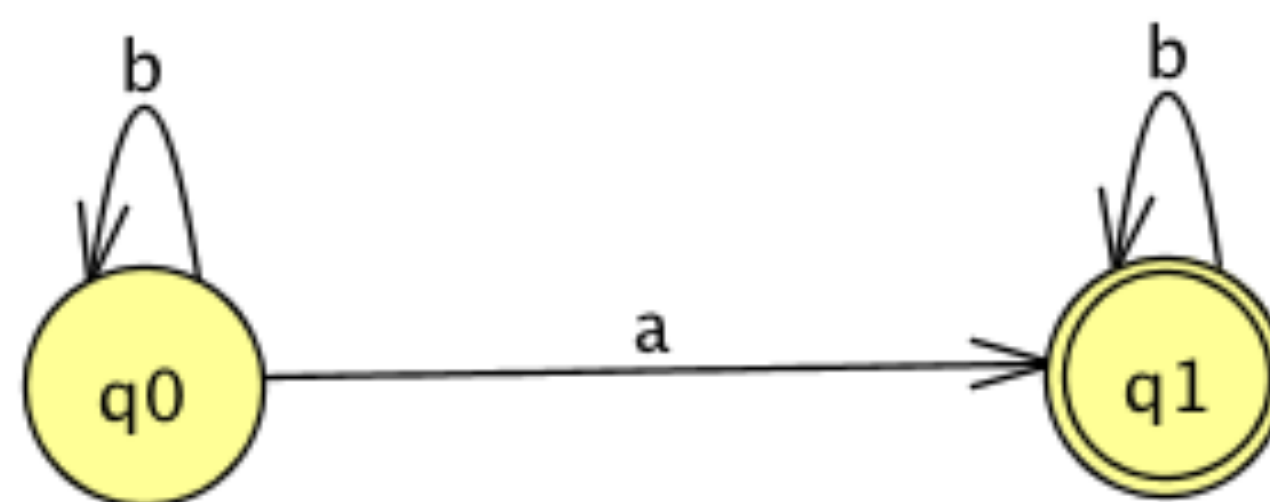
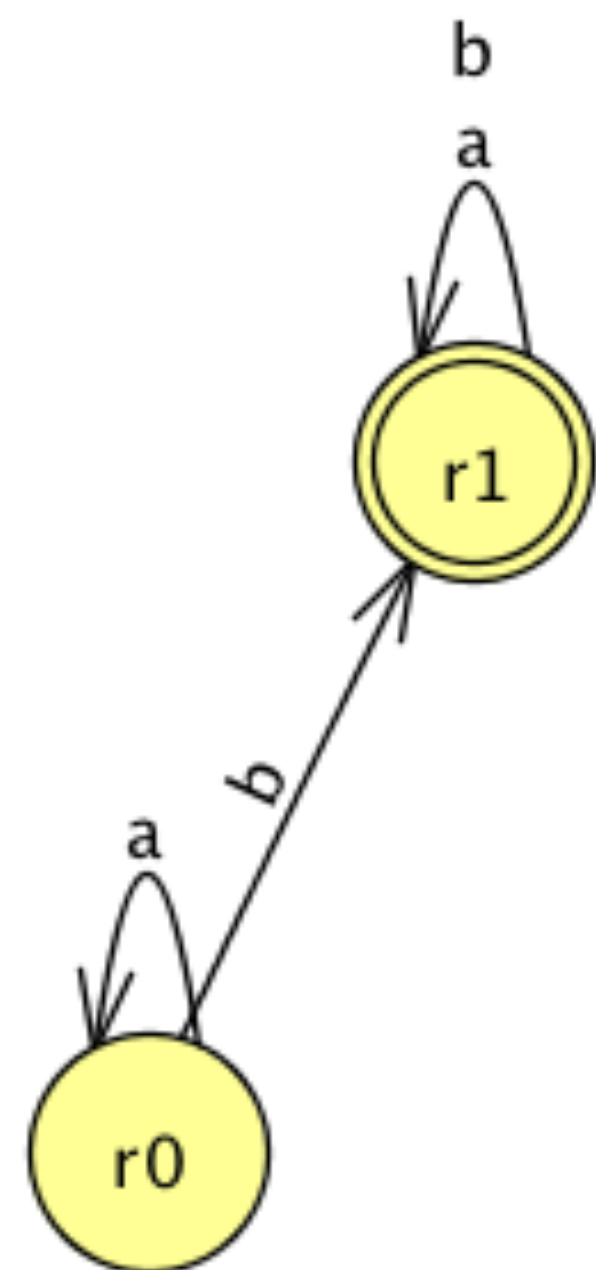
Sisend: + + k a + l - a EOF
 Väljund: [echo, echo, acc, acc, push, echo, acc, push, echo, acc, push]

Väljundsõnade tõlgendamine

- $+$ $+$ k a $+$ \downarrow $-$ a EOF
[echo, echo, acc, acc, push, echo, acc, push, echo, acc, push
- echo(c) lihtsalt tagastab uue tokeni c.
- acc(c) kogub antud tähte (accumulator += c).
- push() lisab akkumuleeritud sõne eraldi tokenina (+ tühjenda akku).
- Tulemus: [+ , + , ka , + , \downarrow , - , a]

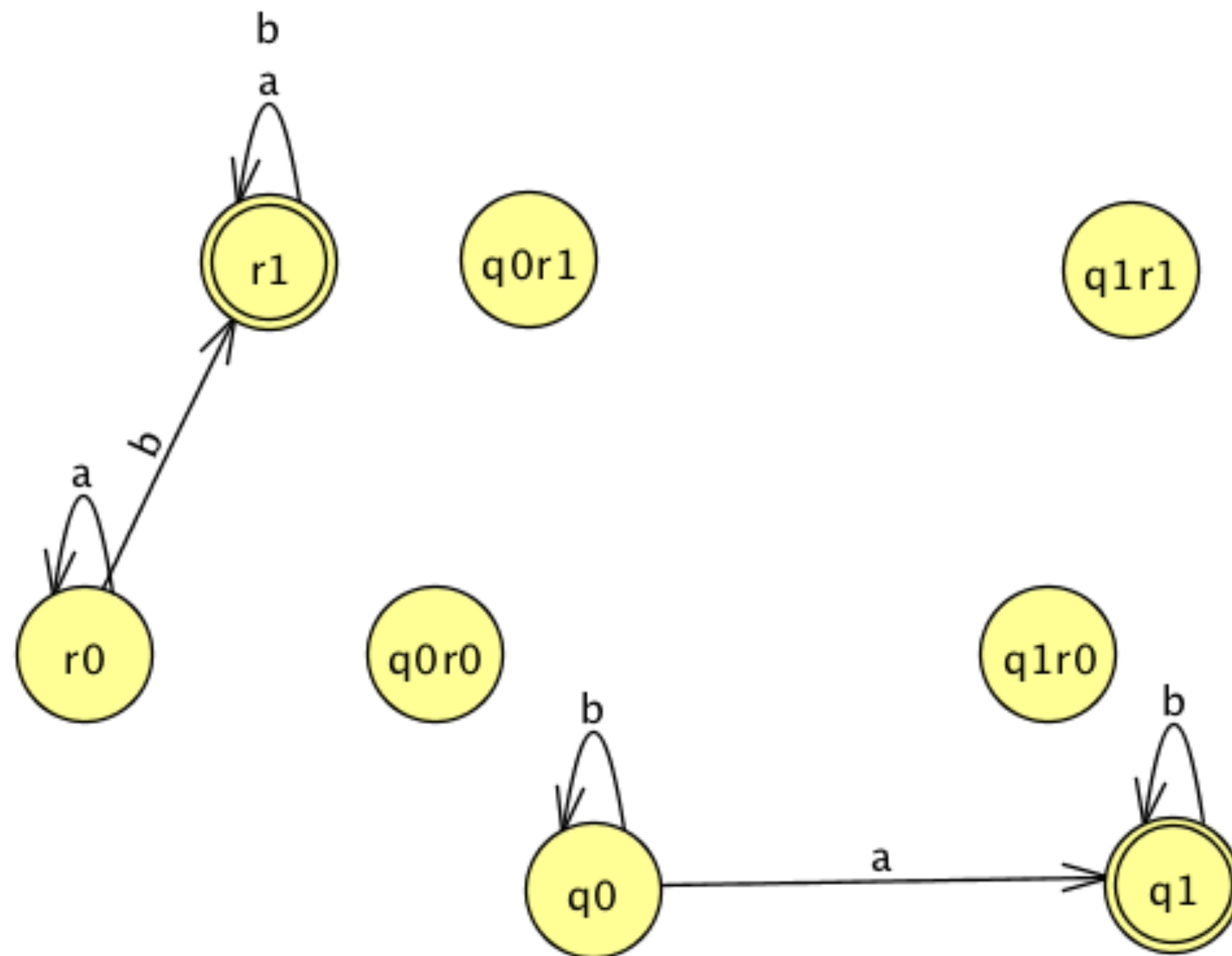
Järgmine ülesanne...

- Kirjutada regulaaravaldis, mis defineerib keele L üle tähestiku $\{a,b\}$.
- $L_1 =$ sõnad, mis sisaldavad täpselt ühte 'a'-d.
- $L_2 =$ sõnad, mis sisaldavad vähemalt ühte 'b'-d.
- $L = L_1 \cap L_2$



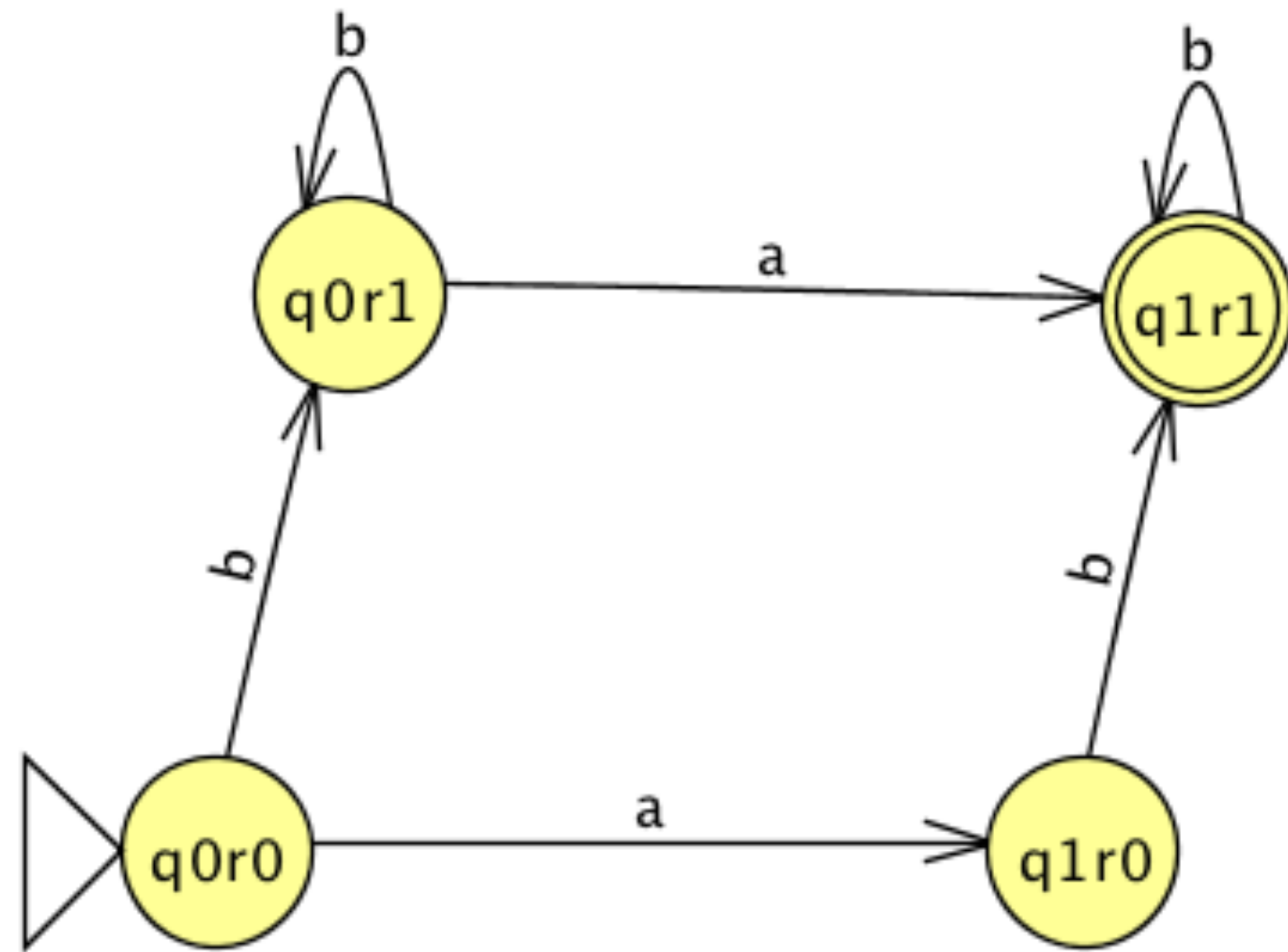
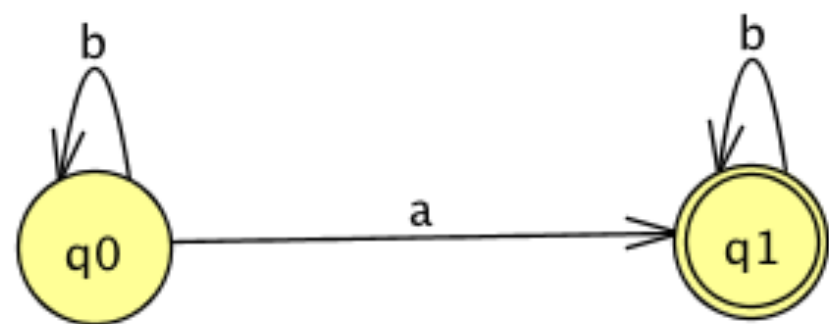
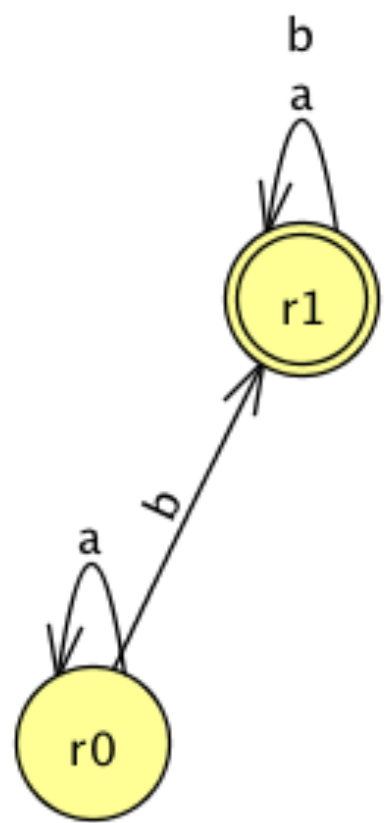
Automaatide Ühisosa

<http://planetmath.org/productofautomata>

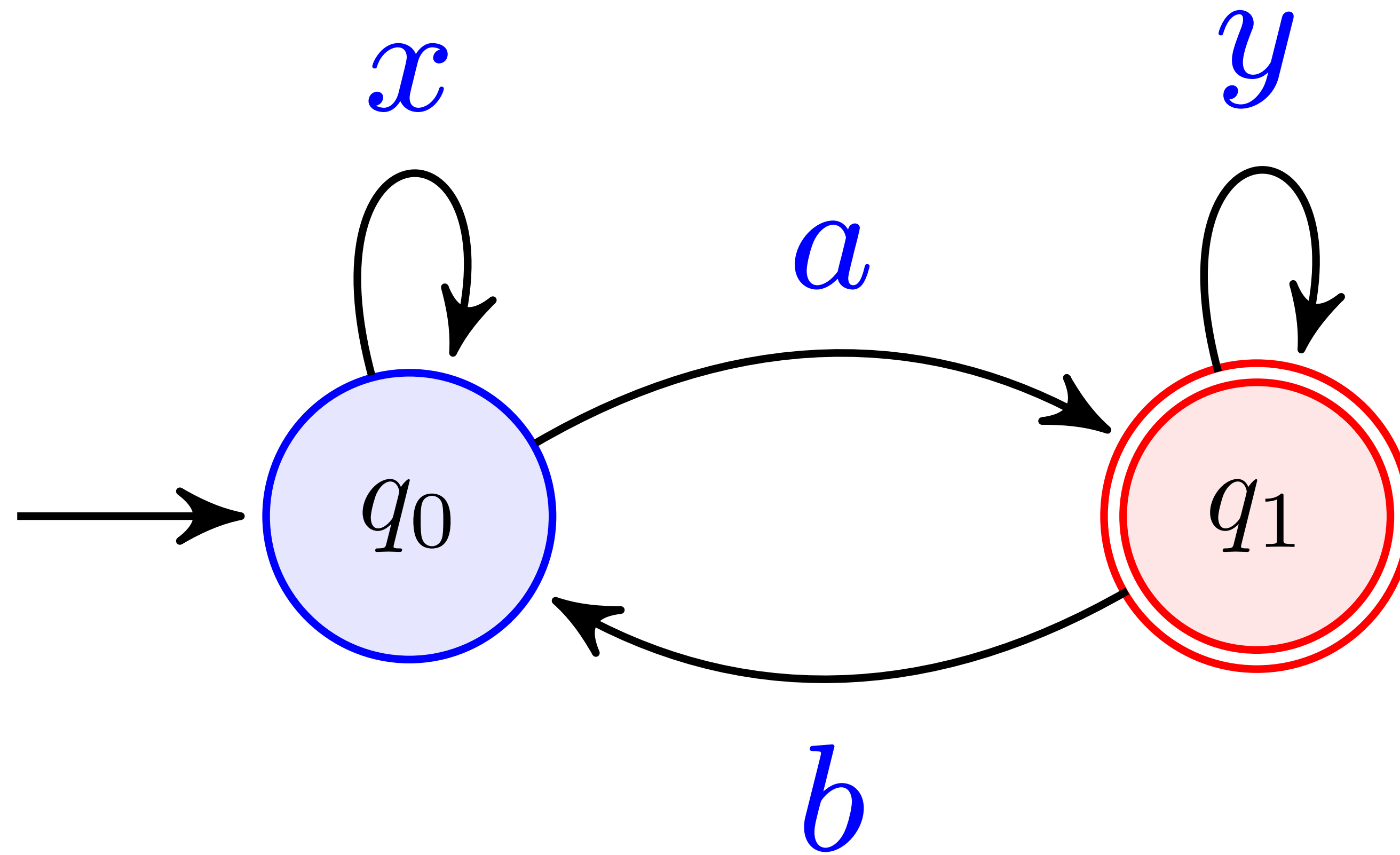


Kõigepealt otsekorrutis

(live demo)

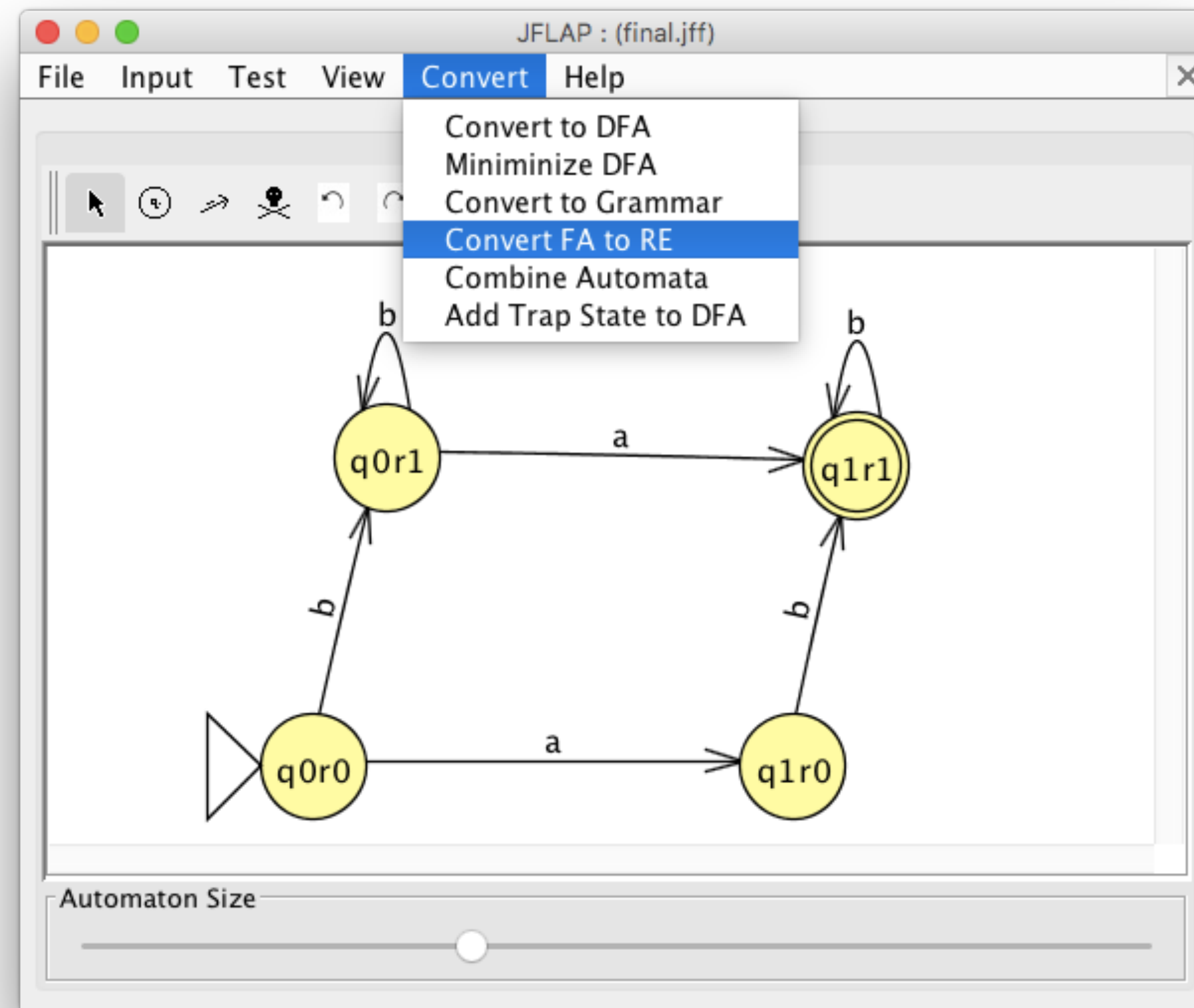


Tulemus



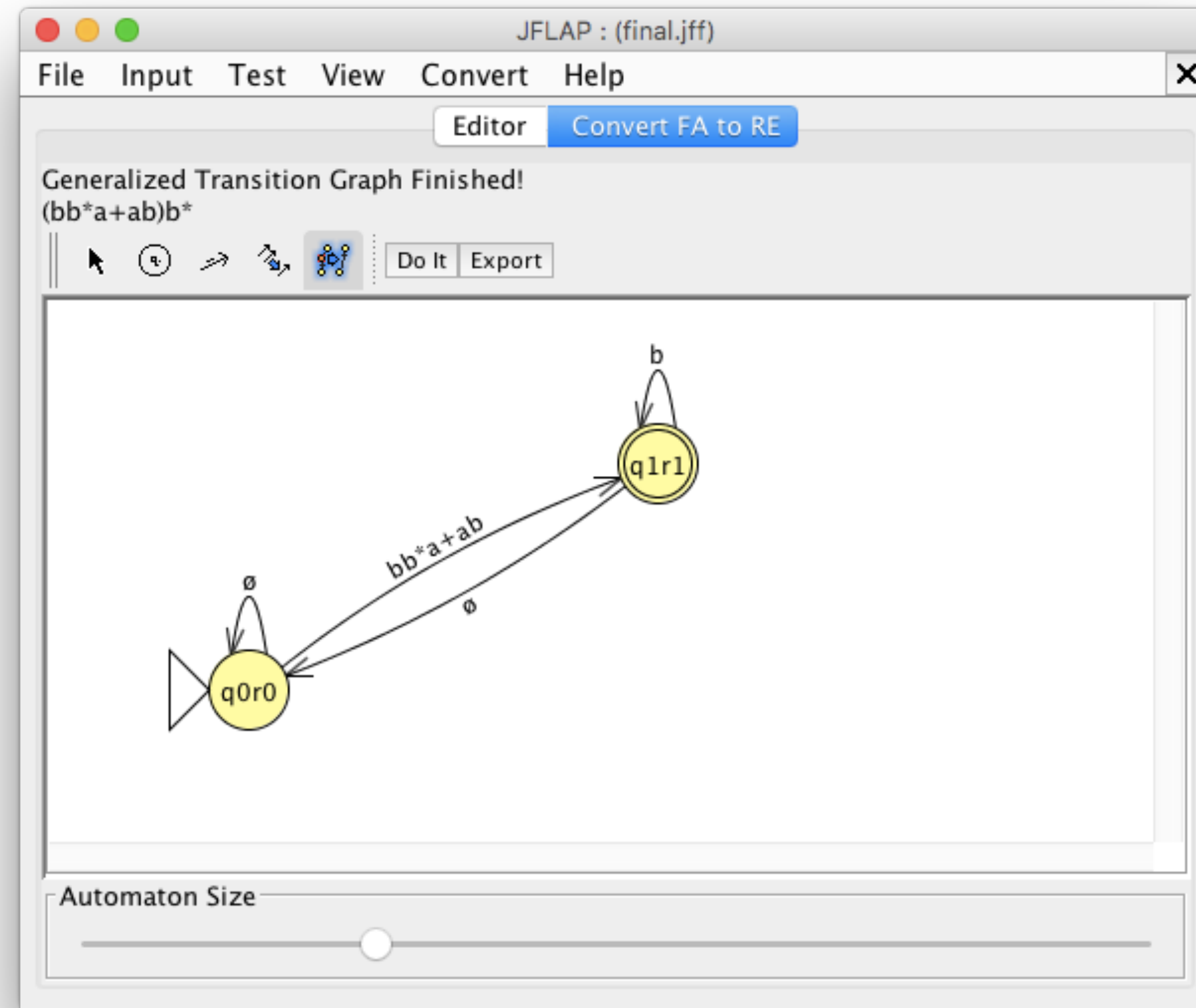
$$(x^* a y^* b)^* x^* a y^*$$

Automaat \rightarrow Regulaaravaldis



Proovime JFLAP abil

(Kõigepealt tahvli peal!)



Tulemus

$(bb^*a|ab)b^*$