Echivalenta dintre expresiile regulare si limbajele acceptate de AF

Teorema:

Daca r este o expresie regulara, atunci exista un AF care accepta multimea secventelor reprezentate de aceasta expresie (multimea regulara). Si reciproc.

- Echivalenta:
  - constructia automatului echivalent
    pentru fiecare dintre constructiile de mai sus
    (nu vom face dem.)
  - constructia expresiei regulare
    ce descrie limbajul acceptat de un automat
    (nu vom face dem.) **(→ ~ seminar)**

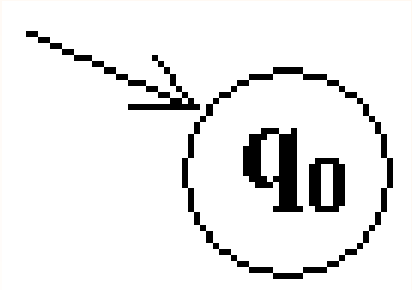
Expresie regulara => limbaj acceptat de AF

- Expresii regulare
  - $\varnothing$
  - ε
  - a daca: $a \in \Sigma$
  - r+s daca r,s – expresii regulare
  - rs daca r,s – expresii regulare
  - r* daca r – expresie regulara
- Constructia automatului echivalent

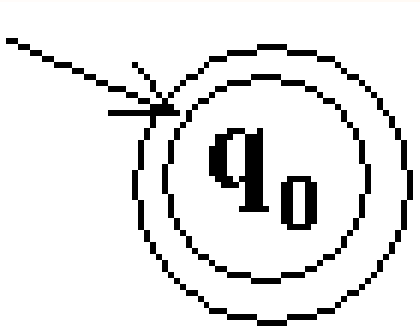
  pentru fiecare dintre constructiile de mai sus

Expresie regulara=> limbaj acceptat de AF

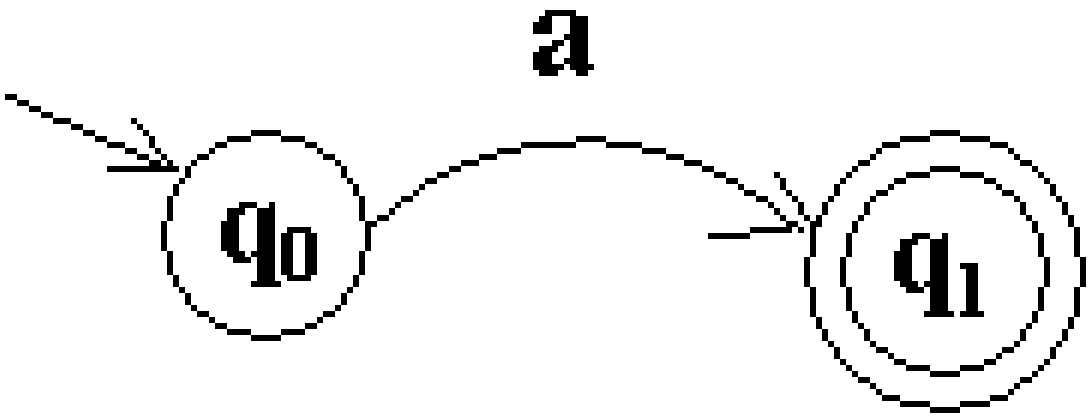
- Automatul ce accepta: Φ



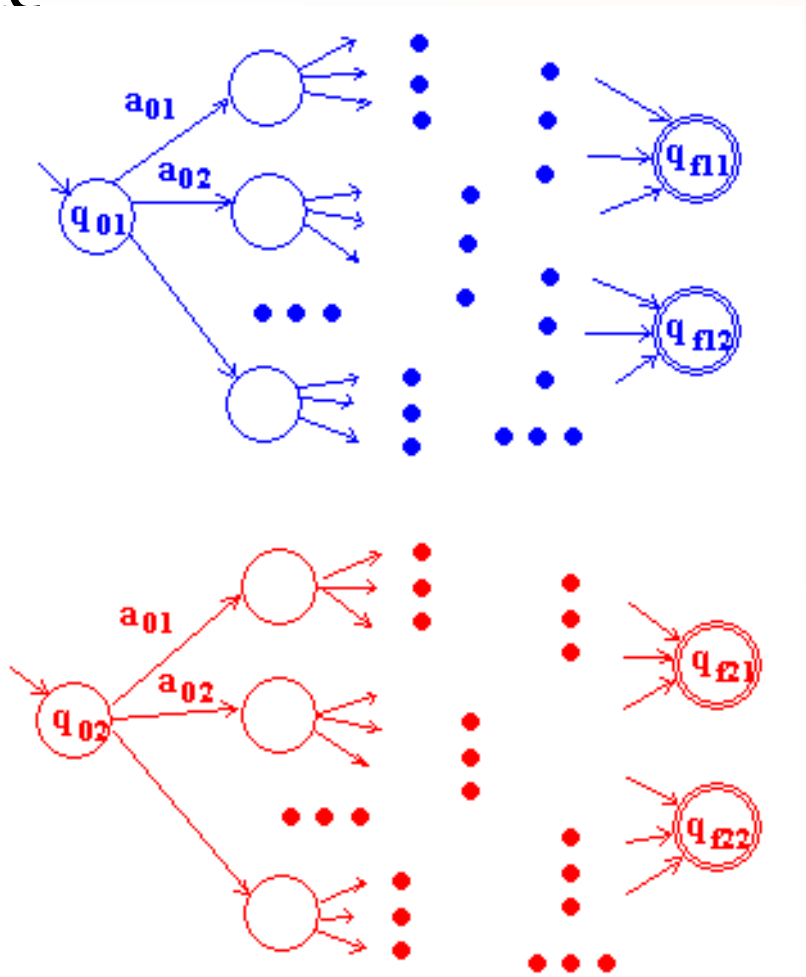
- Automatul ce accepta: ε



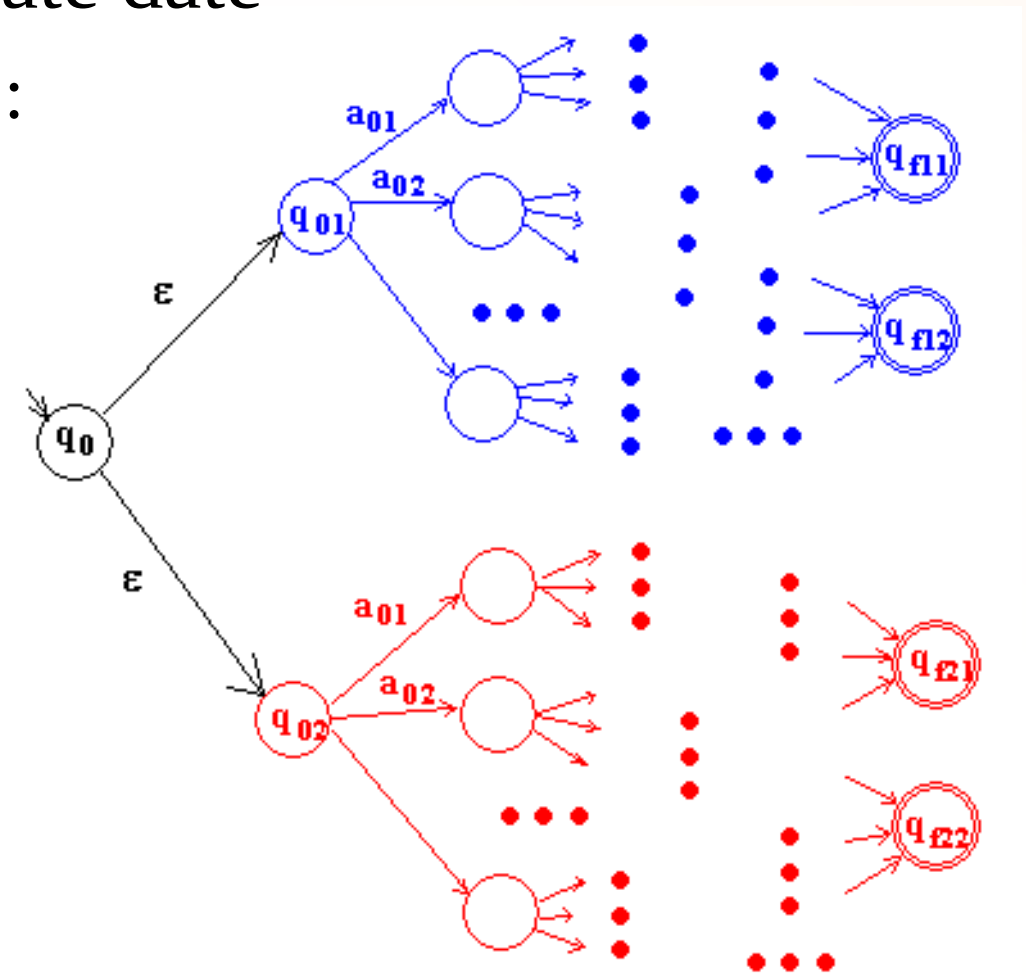
- Automatul ce accepta: a (daca: a ∈ Σ)



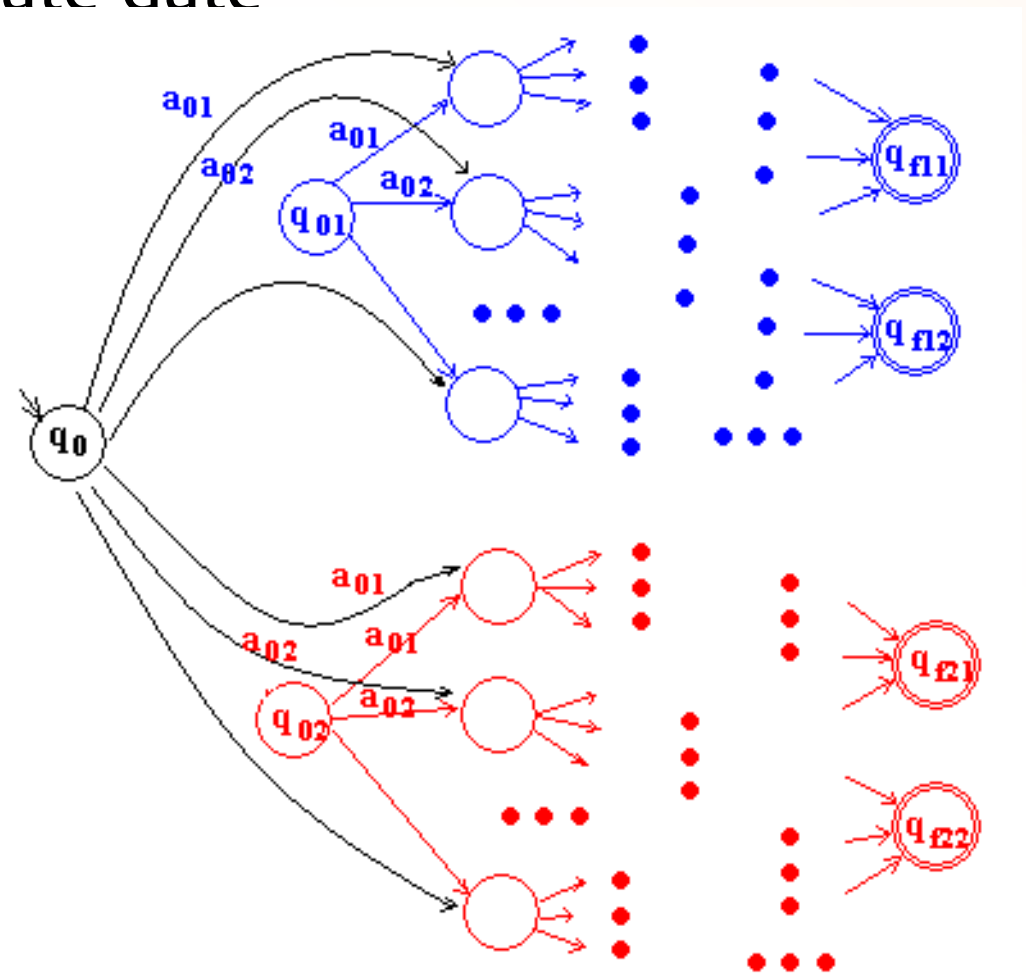
- Automatul ce accepta reuniunea limbajelor acceptate de doua automate date
  - se dau:



- Automatul ce accepta reuniunea limbajelor acceptate de doua automate date
  - AF cu ε tranz.:



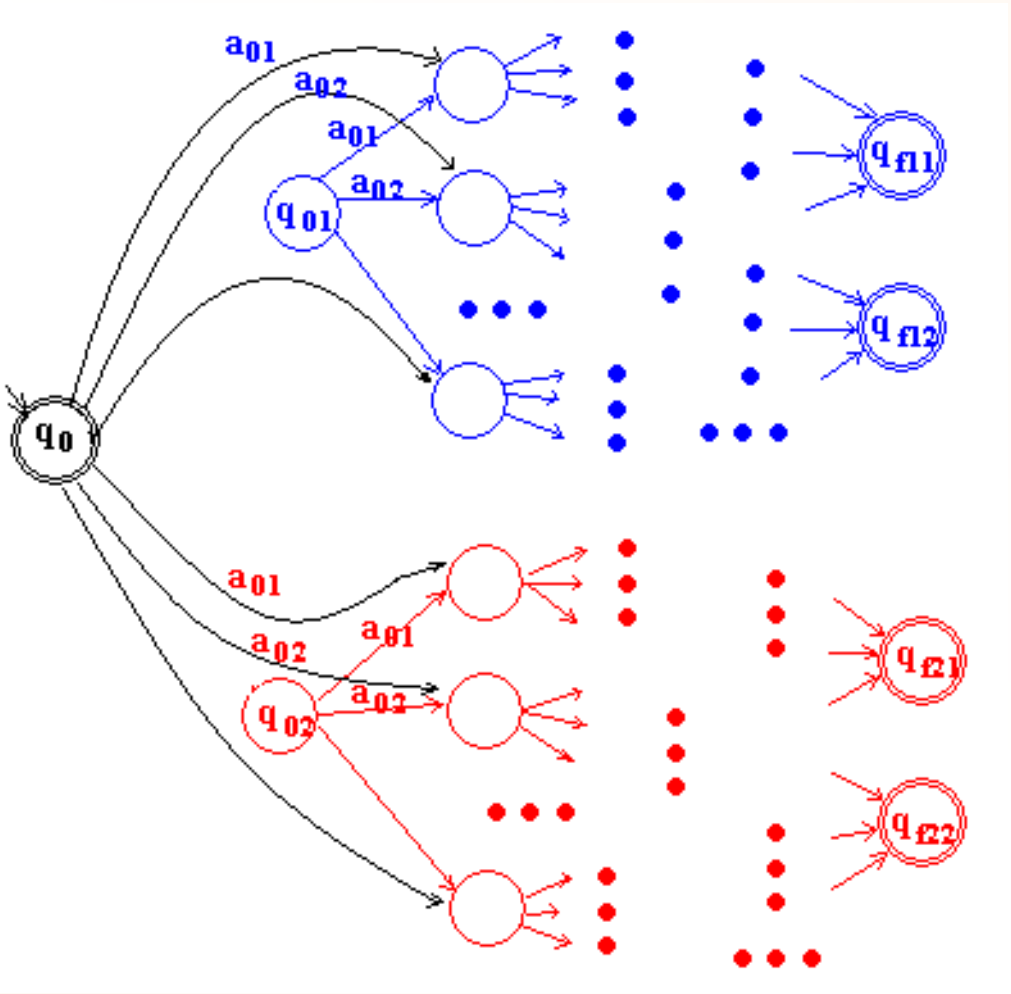
- Automatul ce accepta reuniunea limbajelor acceptate de doua automate date
  - AF



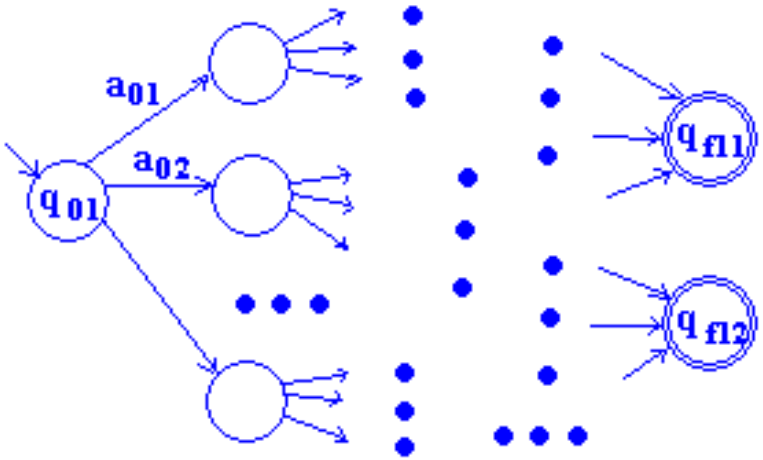
??! cel putin una dintre q_{01} sau q_{02} e stare finala

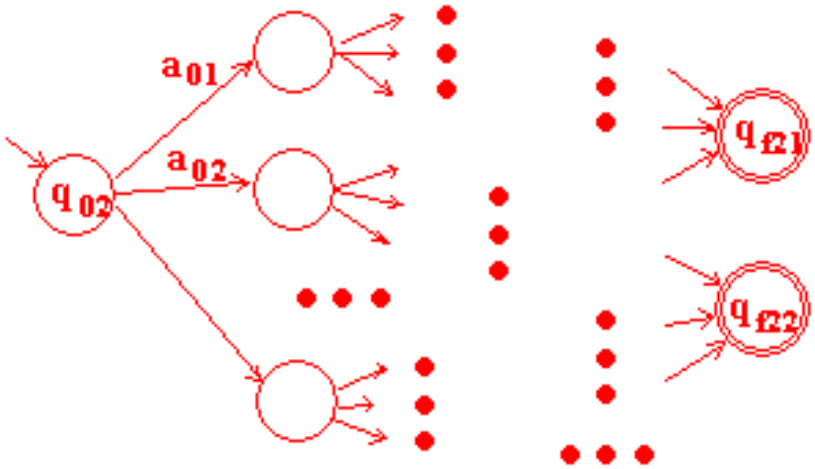
- Automatul ce accepta reuniunea limbajelor acceptate de doua automate date
  - AF

Daca cel putin una dintre q_{01} sau q_{02} este stare finala

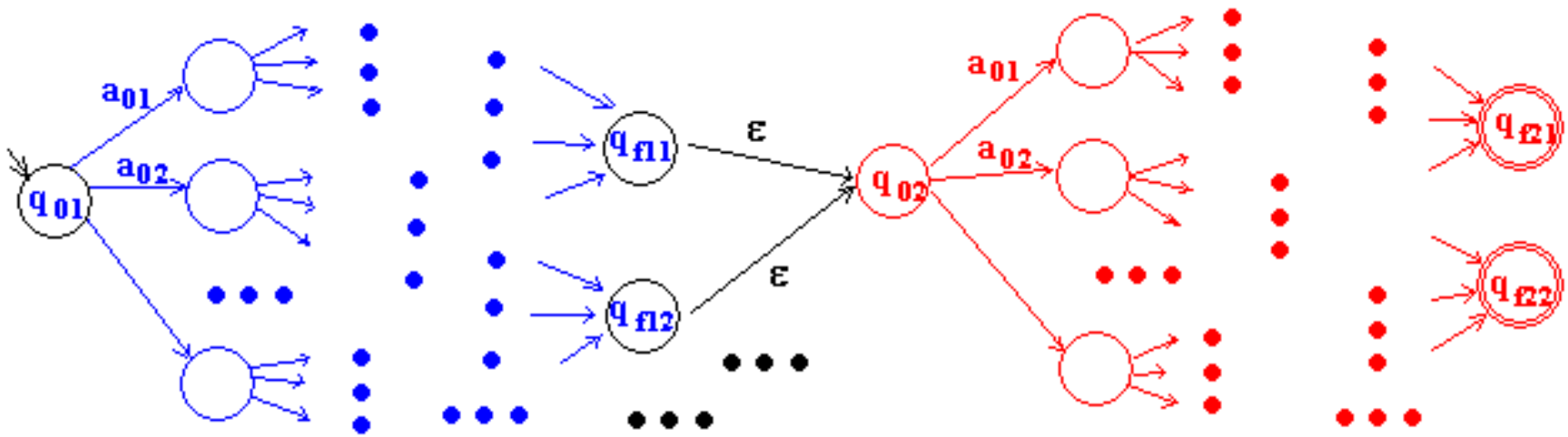


- Automatul ce accepta concatenarea limbajelor acceptate de doua automate date
  - se dau

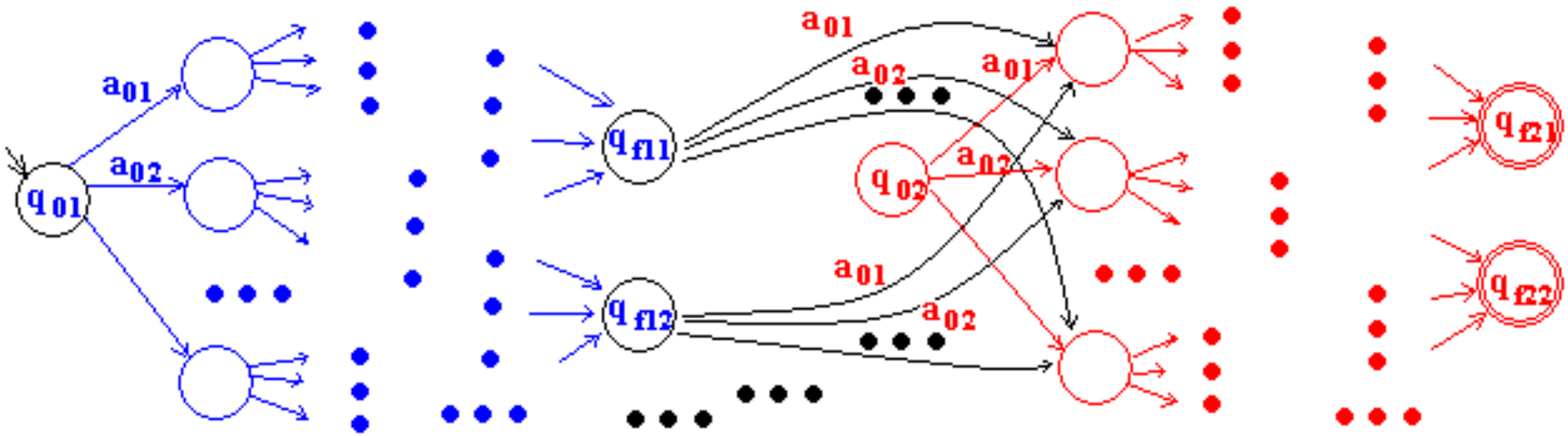




- Automatul ce accepta concatenarea limbajelor acceptate de doua automate date
  - AF cu ε tranz.:

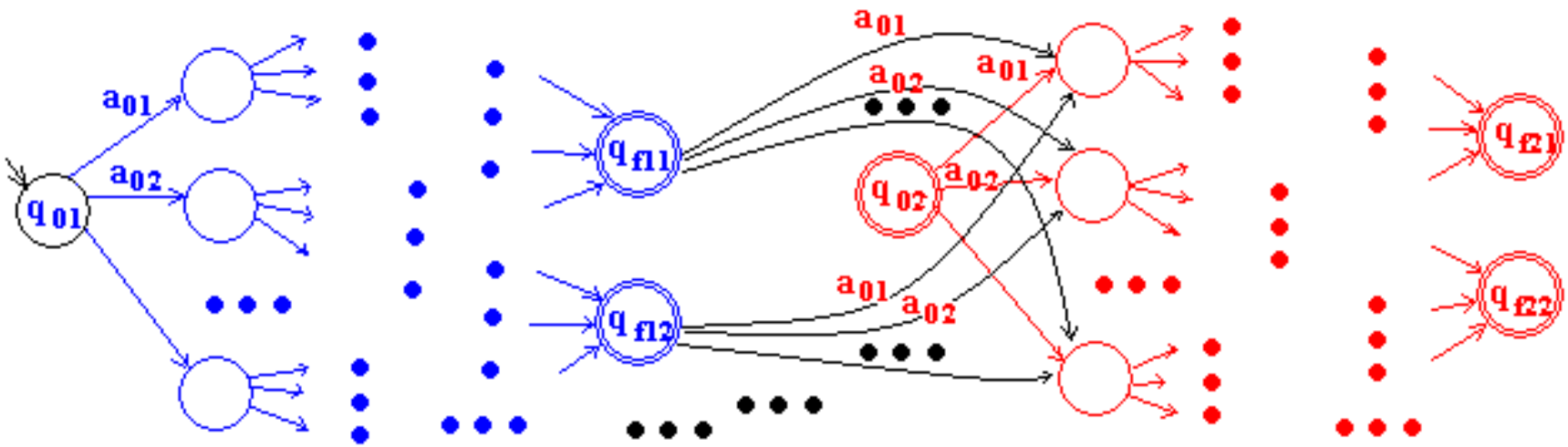


- Automatul ce accepta concatenarea limbajelor acceptate de doua automate date
  - AF



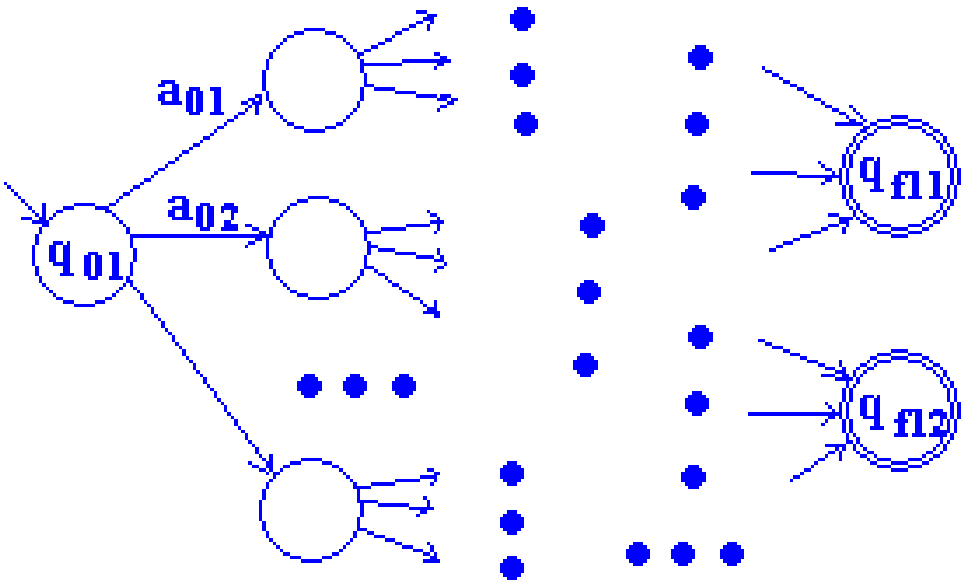
??! q_{02} stare finala

- Automatul ce accepta concatenarea limbajelor acceptate de doua automate date
  - AF

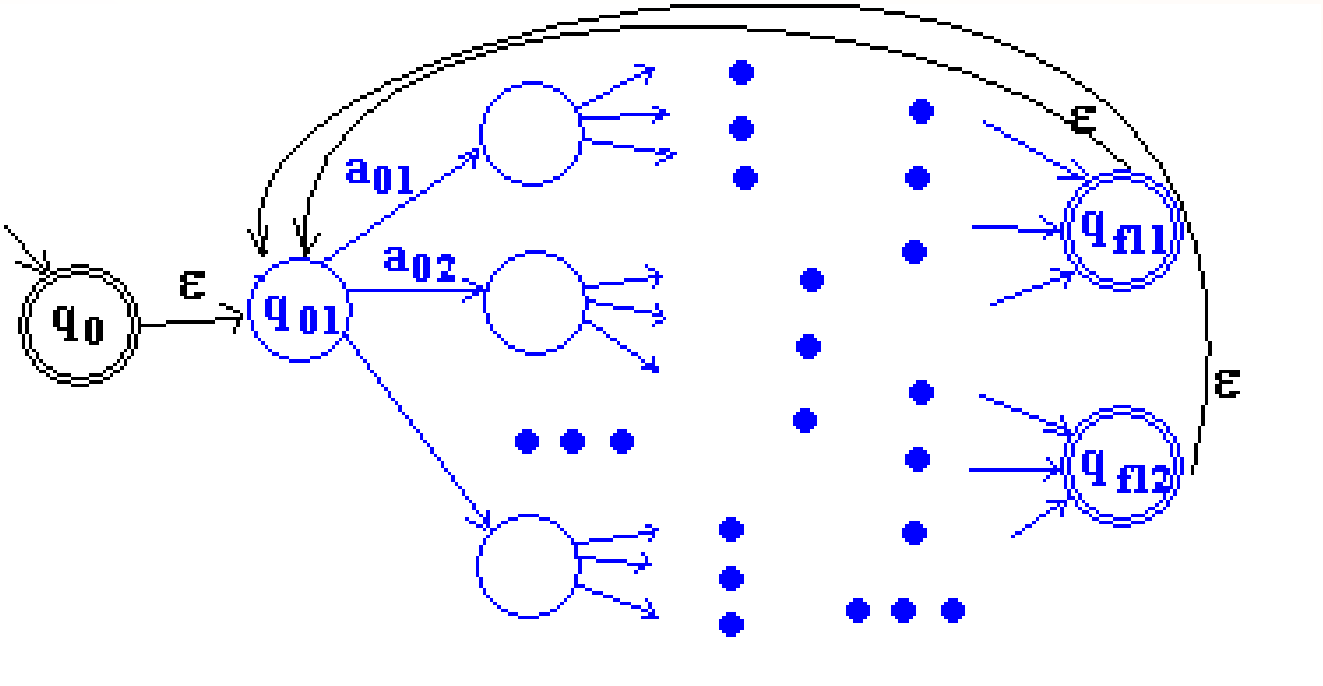


Daca q_{02} stare finala

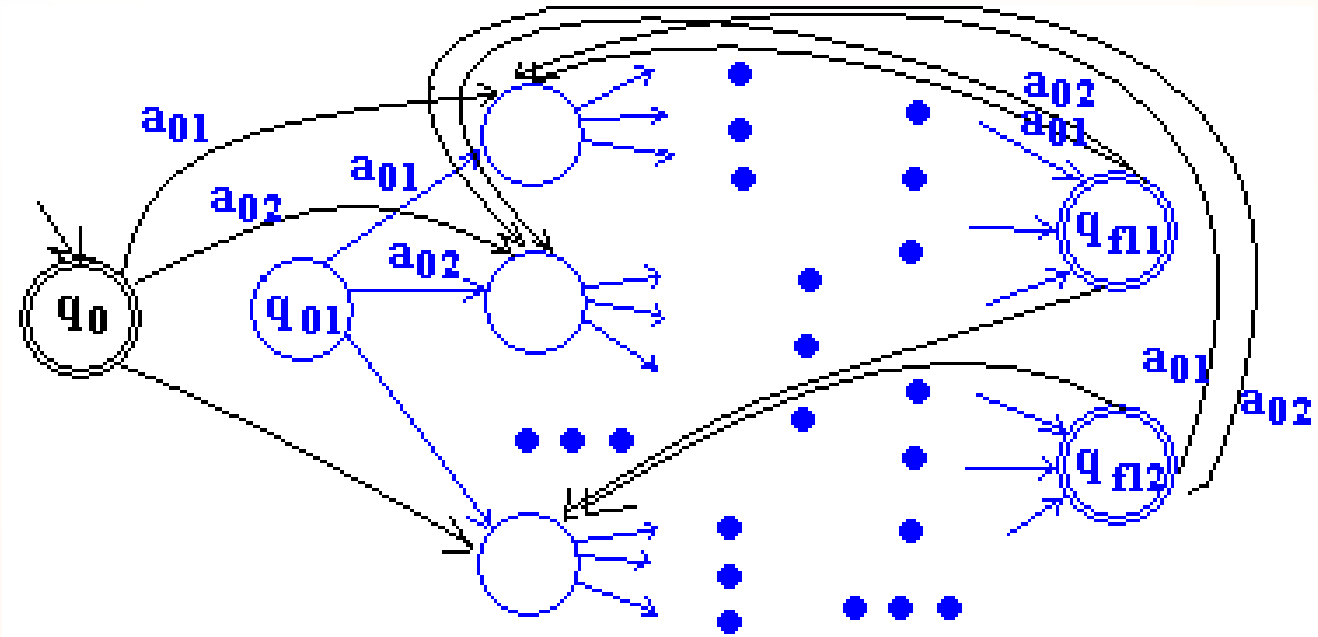
- Automatul ce accepta orice secventa peste limbajul acceptat de un automat dat
  - se da:



- Automatul ce accepta orice secventa peste limbajul acceptat de un automat dat
  - AF cu ε tranz.:



- Automatul ce accepta orice secventa peste limbajul acceptat de un automat dat
  - AF:



??! q_{01} stare finala OK !

Exercitii:
Expresie regulara=> limbaj acceptat de AF

- Automatul ce accepta reuniunea limbajelor acceptate de doua automate date
  - se considera AF pt.:

    aa^*

    bb*
  - se considera AF pt.:

    a^{2n} n – nr. natural; n>=0

    b^{2n+1} n – nr. natural; n>=0

Exercitii:
Expresie regulara=> limbaj acceptat de AF

Construiti automatul ce accepta concatenarea limbajelor acceptate de doua automate date.

a) Se considera AF pt.: a si b

b) Se considera AF pt.: a^* si b*

c) Se considera AF pt.: a si b*

Exercitii:
Expresie regulara=> limbaj acceptat de AF

- Automatul ce accepta orice secventa peste limbajul acceptat de un automat dat
  - se considera AF pt.: a