Lab 4

https://github.com/915-Moldovan-Ioana/FLCD/tree/main/Lab4

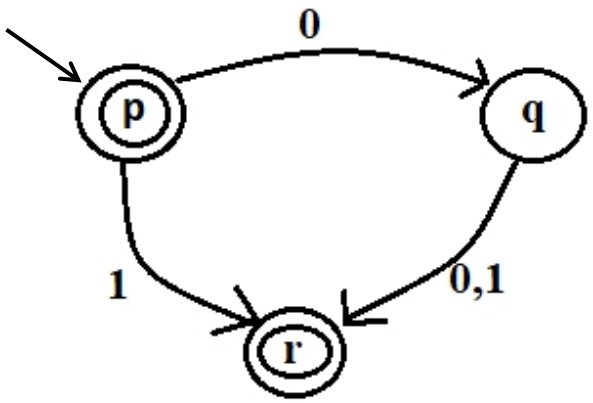
FA:

- FA file format:

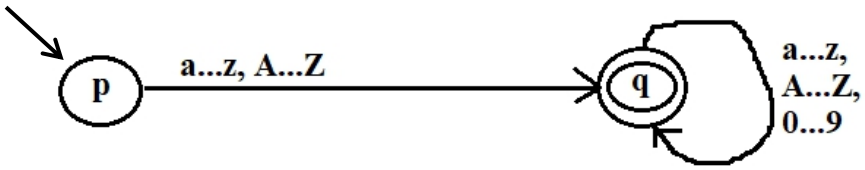
- M = (Q, Σ, δ, q0, F), state ϵ Q, symbol ϵ Σ

file := states “\n” alphabet “\n” initialState “\n” finalStates “\n” transitions;
states := state | state “,” states;
initialState := state;
finalStates := finalState | finalState “,” finalStates;
finalState := state;
transitions := transition | transition “\n” transitions;
transition := state “,” symbol “;” state;

Ex.:
p,q,r - states
0,1 - alphabet
p - initial state
p,r - final states
p,0;q - transitions
p,1;r
q,0;r
q,1;r

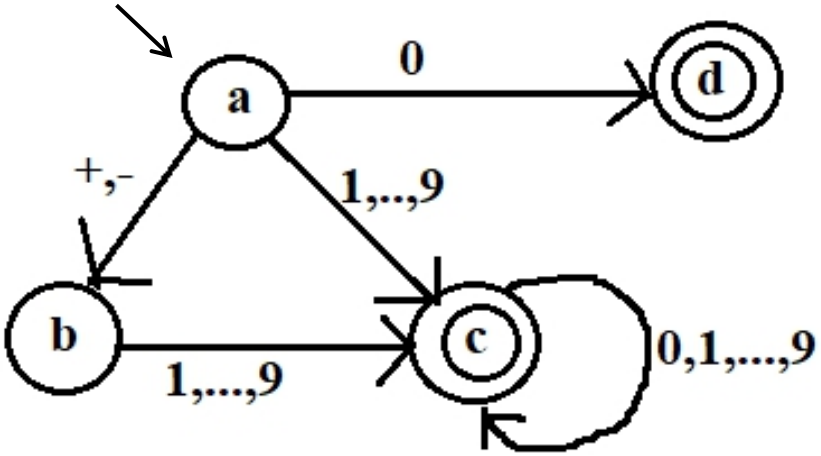


FA for identifiers:



p,q
a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,
S,T,U,V,W,X,Y,Z,0,1,2,3,4,5,6,7,8,9
p
q
p,a;q
p,b;q
p,c;q
p,d;q
p,e;q
p,i;q
p,m;q
p,n;q
p,p;q
p,r;q
q,a;q
q,b;q
q,c;q
q,e;q
q,i;q
q,m;q
q,n;q
q,p;q
q,r;q
q,0;q
q,1;q
q,2;q
q,3;q
q,4;q
q,5;q
q,6;q
q,7;q
q,8;q
q,9;q

FA for integers:



a,b,c,d
0,1,2,3,4,5,6,7,8,9,-,+
a
c,d
a,0;d
a,-;b
a,+;b
a,1;c
a,2;c
a,3;c
a,4;c
a,5;c
a,6;c
a,7;c
a,8;c
a,9;c
b,1;c
b,2;c
b,3;c
b,4;c
b,5;c
b,6;c
b,7;c
b,8;c
b,9;c
c,0;c
c,1;c
c,2;c
c,3;c
c,4;c
c,5;c
c,6;c
c,7;c
c,8;c
c,9;c

FA class:

- fields:
    File file;
    List<String> states;
    List<String> alphabet;
    Map<FAPair, List<String>> transitions; (FAPair: String state, String symbol)
    String initialState;
    Set<String> finalStates;
- methods:
    parseFile(): parses the FA file and groups the inputs
    isDFA(): checks if a FA is deterministic
    verifySequenceRec(String state, String sequence): checks recursively if a given sequence is accepted by the FA (actually, only DFA), starting from the initial state