The program below describes the dynamic system consisting of a battery, two switches, and a lamp, connected in series:

% List of switches
switch(s1; s2).

% Definition of the state at time t-1
h(F,t-1) :- tail(F).

% Any set of actions can be executed between times t-1 and t
{toggle(S,t) : switch(S)}.

% Effect of toggle(S)
h(on(S),t) :- toggle(S,t), h(off(S),t-1).
h(off(S),t) :- toggle(S,t), h(on(S),t-1).

% light is off if some switch is off, and it’s on otherwise.
h(off(lamp),t) :- #count{S : switch(S), h(off(S),t)} > 0.
h(on(lamp),t) :- not h(off(lamp),t).

% Definition of inertial fluent
inertial(on(S); off(S)) :- switch(S).

% Existence and uniqueness constraints
:- h(on(S),t), h(off(S),t), switch(S).
:- not h(on(S),t), not h(off(S),t), switch(S).

% inertia
{h(F,t)} :- inertial(F), h(F,t-1).

#show toggle/2. #show h/2.