% ------------------------------

% Knowledge Base

% ------------------------------

% Initial facts

fact(a).

fact(b).

% Rules of the form: head :- body.

% We represent rules as rule(Head, [BodyList]).

rule(c, [a, b]). % if a and b then c

rule(d, [c]). % if c then d

rule(e, [c, b]). % if c and b then e

rule(f, [d, e]). % if d and e then f

% ------------------------------

% Forward Chaining Engine

% ------------------------------

% Start forward chaining until no new facts can be added

forward\_chain :-

new\_fact(X),

assertz(fact(X)),

write('Derived: '), writeln(X),

forward\_chain.

forward\_chain :-

writeln('No more facts can be derived.').

% Find a new fact that can be inferred but not yet known

new\_fact(F) :-

rule(F, Conditions),

all\_conditions\_true(Conditions),

\+ fact(F).

% Check all conditions in the body are true

all\_conditions\_true([]).

all\_conditions\_true([H|T]) :-

fact(H),

all\_conditions\_true(T).

% ------------------------------

% Sample Queries

% ------------------------------

% Run forward chaining:

% ?- forward\_chain.

%

% Expected output:

% Derived: c

% Derived: d

% Derived: e

% Derived: f

% No more facts can be derived.