**AI Lab – 5**

Name: Mokshit Oswal

Class: AI-B

Roll Number – 32

PRN: 12111304

Batch B2

% Facts defining the family relationships

male(michael).

male(franklin).

male(trevor).

male(solomon).

female(lisa).

female(elena).

female(mary).

parent(michael, franklin).

parent(michael, lisa).

parent(michael, elena).

parent(elena, solomon).

parent(franklin, mary).

parent(franklin, trevor).

% Rules for defining other relationships

father(X, Y) :- male(X), parent(X, Y).

mother(X, Y) :- female(X), parent(X, Y).

sibling(X, Y) :- parent(Z, X), parent(Z, Y), X \= Y.

brother(X, Y) :- male(X), sibling(X, Y).

sister(X, Y) :- female(X), sibling(X, Y).

grandparent(X, Z) :- parent(X, Y), parent(Y, Z).

grandfather(X, Z) :- male(X), grandparent(X, Z).

grandmother(X, Z) :- female(X), grandparent(X, Z).

% Additional rules for generating hypotheses

ancestor(X, Y) :- parent(X, Y).

ancestor(X, Y) :- parent(X, Z), ancestor(Z, Y).

descendant(X, Y) :- ancestor(Y, X).

cousin(X, Y) :- parent(PX, X), parent(PY, Y), sibling(PX, PY).

uncle(X, Y) :- male(X), sibling(X, P), parent(P, Y).

aunt(X, Y) :- female(X), sibling(X, P), parent(P, Y).

% Hypotheses generator

hypothesize(X) :- ancestor(X, Y), format('Hypothesis: ~w is an ancestor of ~w.~n', [X, Y]).

hypothesize(X) :- descendant(X, Y), format('Hypothesis: ~w is a descendant of ~w.~n', [X, Y]).

hypothesize(X) :- cousin(X, Y), format('Hypothesis: ~w is a cousin of ~w.~n', [X, Y]).

hypothesize(X) :- uncle(X, Y), format('Hypothesis: ~w is an uncle of ~w.~n', [X, Y]).

hypothesize(X) :- aunt(X, Y), format('Hypothesis: ~w is an aunt of ~w.~n', [X, Y]).

% Example queries

% Generate hypotheses based on the defined relationships

?- hypothesize(elena).

?- hypothesize(trevor).