**VISHWAKARMA INSTITUTE OF TECHNOLOGY**

COMPUTER ENGINEERING

**Name: Abhinav Mahajan**

**Division: TY-C**

**Roll No: 15**

**Subject: Artificial Intelligence (AI)**

**LAB ASSIGNMENT NO – 5**

Implementation of predicate logic using PROLOG.

*Implementation of an expert system using Prolog means creating a knowledge-based system that uses rules, facts, and inference mechanisms to make decisions or provide expert-level advice in a specific domain.*

It allows you to capture complex relationships and perform automated reasoning, making it a powerful tool for creating expert systems.

**Code:**

% Facts

female(mary).

female(lisa).

female(susan).

female(emma).

male(john).

male(david).

male(alex).

male(paul).

parent(mary, david).

parent(alex, david).

parent(alex, lisa).

parent(david, susan).

parent(david, emma).

parent(emma, john).

parent(david, paul).

parent(paul, john).

% Rules

sister(X, Y) :- parent(Z, X), parent(Z, Y),

female(X),

X \== Y.

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

female(X).

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

male(X).

brother(X, Y) :- parent(Z, X), parent(Z, Y),

male(X),

X \== Y.

This Prolog code represents a family tree with facts and rules for defining relationships within the family.

**Facts:**

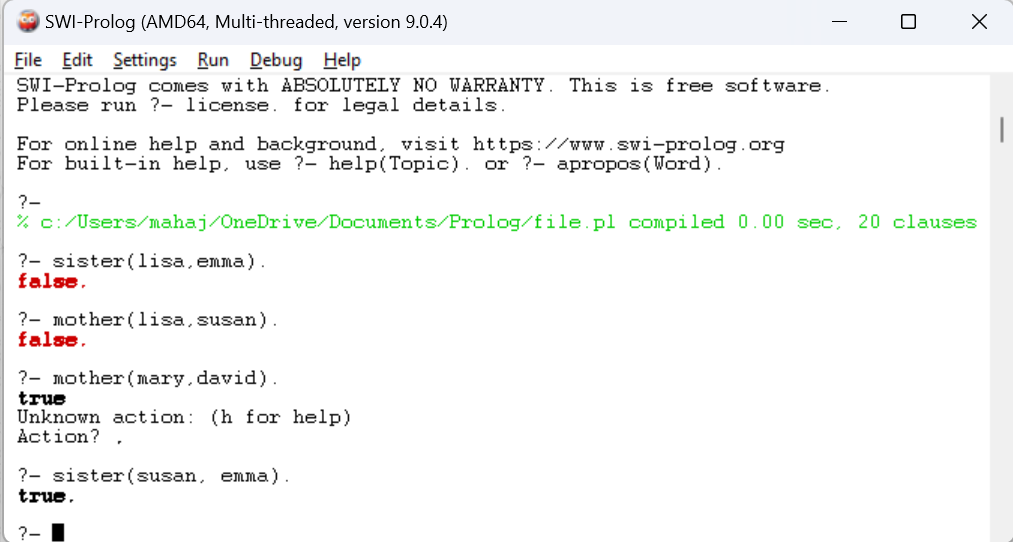
The code defines individuals as male or female.

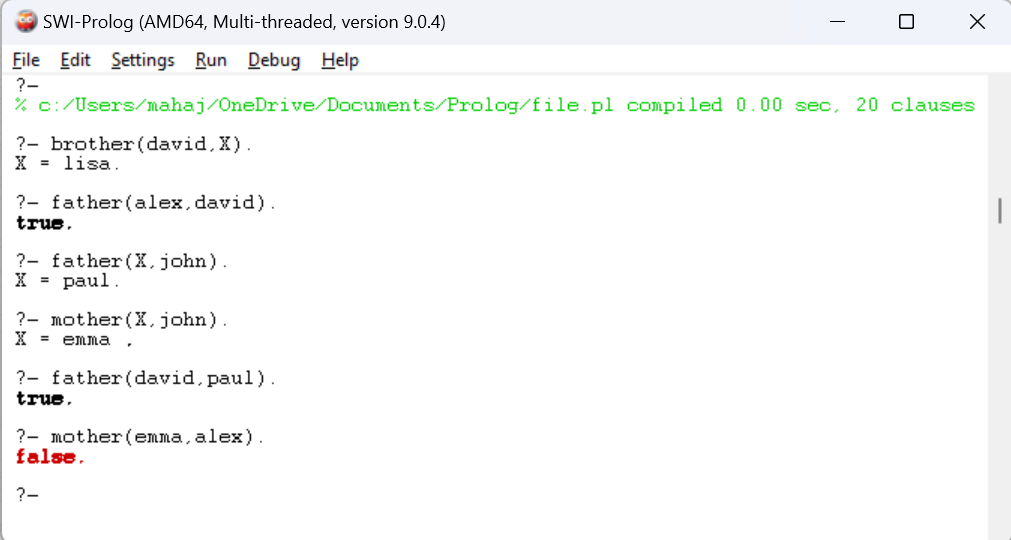
It establishes parent-child relationships in the family tree.

**Rules:**

* **sister(X, Y):** X is a sister of Y if they share the same parent and X is female.
* **mother(X, Y):** X is the mother of Y if X is the parent of Y and X is female.
* **father(X, Y):** X is the father of Y if X is the parent of Y and X is male.
* **brother(X, Y):** X is a brother of Y if they share the same parent and X is male.

**Output:**

****

****