AI Lab2

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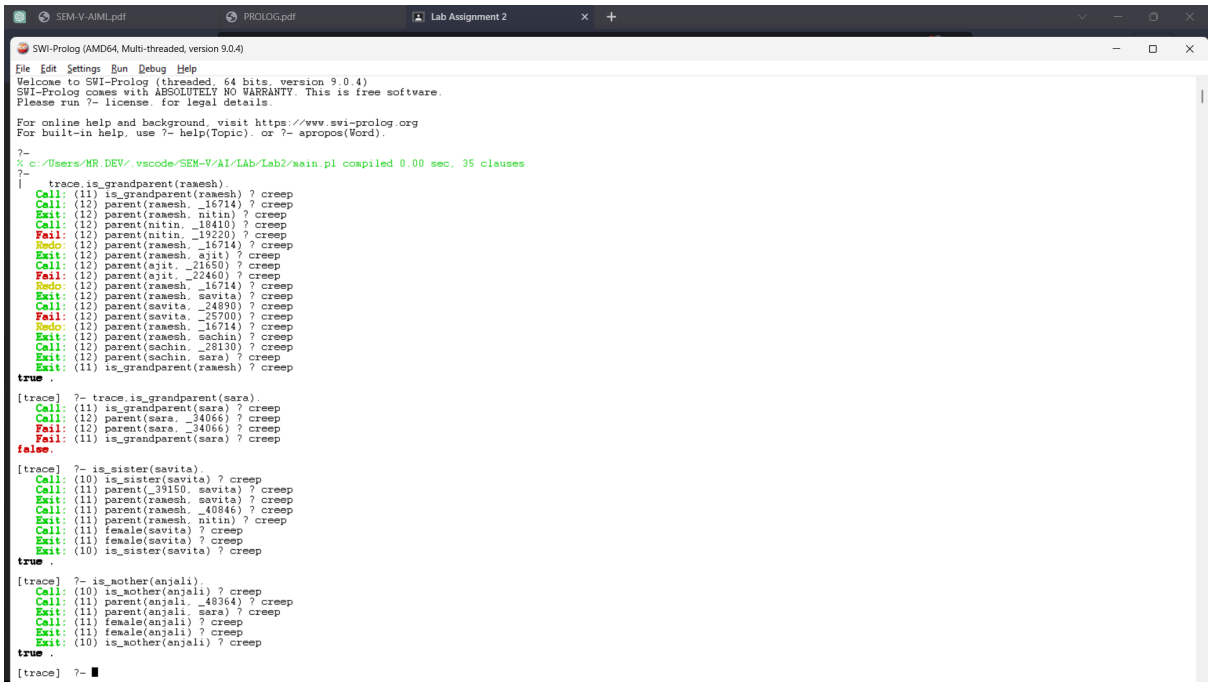
Code

```
%parent data
parent(ramesh,nitin).
parent(ramesh,ajit).
parent(ramesh,savita).
parent(ramesh,sachin).
parent(rajni,savita).
parent(rajni,nitin).
parent(rajni,sachin).
parent(rajni,ajit).
parent(sachin,sara).
parent(sachin,arjun).
parent(anjali,sara).
parent(anjali,arjun).
%gender data
male(ramesh).
male(nitin).
male(ajit).
male(sachin).
male(arjun).
female(rajni).
female(savita).
female(anjali).
female(sara).

%functions for questions 3
grandparent(X,Y) :- parent(X,Z),parent(Z,Y). %grandparent relation
mother(X,Y) :- parent(X,Y),female(X). %mother relation
father(X,Y) :- parent(X,Y),male(X). %father relation
brother(X,Y) :- parent(Z,X),parent(Z,Y),male(X),X\=Y. %brother relation
sister(X,Y) :- parent(Z,X),parent(Z,Y),female(X),X\=Y. %sister relation

%functions for question 5
has_atleast_two_children(X) :- parent(X, Y1), parent(X, Y2),Y1 \= Y2,(sister(Y1, Y2) ; brother(Y1, Y2)).
grandchild(X,Y) :- grandparent(Y,X).
aunt(X,Y):-parent(Z,Y),sister(X,Z).
uncle(X,Y) :- parent(Z,Y),brother(X,Z).

%successor relation recursive function
successor(X, Y) :- parent(Y, X).
successor(X, Y) :- parent(Y, Z), successor(X, Z).

%Week2
%relations using anonymous variables
is_grandparent(X) :- parent(X,Y),parent(Y,_).
is_sister(X) :- parent(Z,X),parent(Z,_),female(X).
is_mother(X) :- parent(X,_),female(X).
```

Output Screenshots



Question 3

(a) `point(A, B) = point(l, 2)`:
This operation will succeed. The resulting instantiations will be:

- A = l
- B = 2

(b) `plus(2, 2) = 4`:
This operation will fail. In Prolog, we cannot match an arithmetic operation (`plus(2, 2)`) with a number (`4`).

(c) `triangle(point(-1, 0), P2, P3) = triangle(Pl, point(1, 0), point(0, Y))`:
This operation will succeed. The resulting instantiations will be:

- P2 = point(1, 0)
- P3 = point(0, Y)
- Pl = -1 (due to the first point's X coordinate)
- Y will remain uninstantiated (it's not provided in the first triangle term)
