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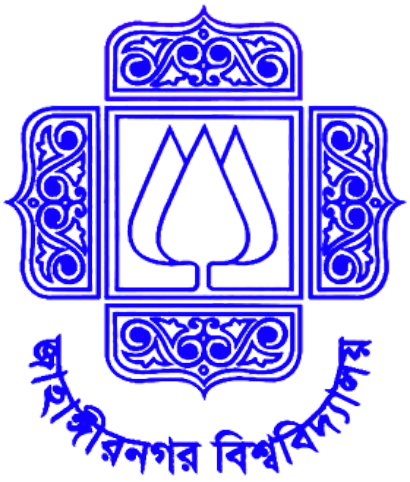

Laboratory Report

CSE-404: Artificial Intelligence Laboratory

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Experiment No. 04
Experiment Name: Write a prolog program for advance arithmetic.
Prolog Code advance arithmetic:

D:\AI Laboratory\ArithmaticOperations.pl - Sublime Text (UNREGISTERED)

File Edit Selection Find View Goto Tools Project Preferences Help

ArithmaticOperations.pl

```
1  plus(X, Y) :- S is X + Y, write(S).
2  minus(X, Y) :- S is X - Y, write(S).
3  multiply(X, Y) :- S is X * Y, write(S).
4  division(X, 0) :- write("divide by zero").
5  division(X, Y) :- S is X / Y, write(S).
6  modulus(X, Y) :- S is X mod Y, write(S).
7  power(X, Y) :- S is X ^ Y, write(S).
```

Figure 01: Prolog Code

SWI-Prolog -- d:/AI Laboratory/ArithmaticOperations.pl

File Edit Settings Run Debug Help

```
Warning: d:/ai laboratory/arithmaticoperations.pl:4:
        Singleton variables: [X]
Welcome to SWI-Prolog (threaded, 64 bits, version 8.0.3)
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software.
Please run ?- license. for legal details.

For online help and background, visit http://www.swi-prolog.org
For built-in help, use ?- help(Topic). or ?- apropos(Word).

?- plus(4,5).
9
true.

?- minus(4,5).
-1
true.

?- multiply(4,5).
20
true.

?- division(4,5).
0.8
true.

?- modulus(4,5).
4
true.

?- power(4,5).
1024
true.

?-
```

Figure 02: Result

Prolog Code travelling salesman :

```
road(savar,mirpur, 10).
road(mirpur,savar, 10).
road(savar,gabtoli, 6).
road(gabtoli,savar, 6).
road(gabtoli,mirpur, 3).
road(mirpur,gabtoli, 3).
road(shahbag,mirpur, 3).
road(mirpur,shahbag, 3).
road(farmgate,mirpur, 1).
road(mirpur,farmgate, 1).
road(farmgate,shahbag, 1).
road(shahbag,farmgate, 1).
road(farmgate,shaymoli, 9).
road(shaymoli,farmgate, 9).
road(gabtoli,shaymoli, 6).
road(shaymoli,gabtoli, 6).
road(motijhil,shaymoli, 4).
road(shaymoli,motijhil, 4).
road(motijhil,shahbag, 8).
road(shahbag,motijhil, 8).

get_road(Start, End, Visited, Result) :-
    get_road(Start, End, [Start], 0, Visited, Result).

get_road(Start, End, Waypoints, DistanceAcc, Visited, TotalDistance) :-
    road(Start, End, Distance),
    reverse([End|Waypoints], Visited),
    TotalDistance is DistanceAcc + Distance.

get_road(Start, End, Waypoints, DistanceAcc, Visited, TotalDistance) :-
    road(Start, Waypoint, Distance),
    \+ member(Waypoint, Waypoints),
    NewDistanceAcc is DistanceAcc + Distance,
    get_road(Waypoint, End, [Waypoint|Waypoints], NewDistanceAcc, Visited, TotalDistance).
```