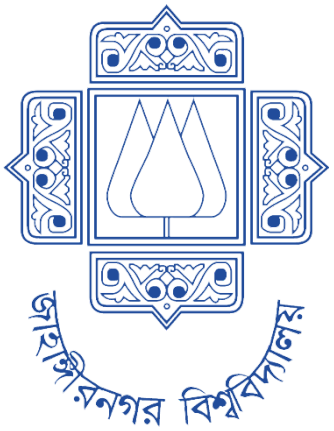
Institute of Information Technology (IIT)

Jahangirnagar University



Lab Report: 02

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Lab Report # Day 02

Example 1:

Problem Name : Prolog Comparison 1,2

Clause:

```
%sectionA
goal(brazil,4).
goal(germany,3).
goal(france,1).

%sectionB
goal(argentina,2).
goal(portugal,5).
goal(japan,1).


go:-
write('enter section A country name'),nl,
read(X),nl,
goal(X,Y),nl,
write('Section A country score is'),nl,
write(Y),nl,


write('enter section B country name'),nl,
read(P),nl,
goal(P,Q),nl,
write('Section B country score is'),nl,
write(Q),nl,


compare(Y,Q).
compare(Y,Q):-
Y>Q,nl,
write('Section A country is the winner');
Y<Q,nl,
write('Section B country is the winner');
Y=:=Q,nl,
write('Draw in both section').
```

Query and Result:

```
?-
% e:/academic study/4_1 semester/AI LAB/Lab 2/T1.pl compiled 0.00 sec, 8 clauses
?- go.
enter section A country name
|: argentina.


Section A country score is
2
enter section B country name
|: germany.


Section B country score is
3

Section B country is the winner
true .

?-
```

Example 2:

Problem Name:BackTracking

Clause:

```
boy(tom).
boy(bob).
girl(alice).
girl(lili).
pay(X,Y):-boy(X),girl(Y).
```

Query and Result:

```
?-
% e:/academic study/4_1 semester/AI LAB/Lab 2/T2.pl compiled 0.00 sec, 5 clauses
?- pay(X,Y).
X = tom,
Y = alice ;
X = tom,
Y = lili ;
X = bob,
Y = alice ;
X = bob,
Y = lili.

?-
```

Example 3:

Problem Name : Recursion:Eating

Clause:

```
isDigesting(X,Y):-justAte(X,Y).
isDigesting(X,Y):-justAte(X,Z),isDigesting(Z,Y).

justAte(mosquito,blood(john)).
justAte(frog,mosquito).
justAte(stork,frog).
```

Query and Result:

```
% e:/academic study/4_1 semester/AI LAB/Lab 2/T3.pl compiled 0.00 sec, 5 clauses
?- isDigesting(stork,mosquito).
true
```

Example 4:

Problem Name :

Clause:

```
factorial(0,1).

factorial(N,Result):-
N>0,
N1 is N-1,
factorial(N1,SubResult),
Result is N*SubResult.
```

Queries and Result:

```
% e:/academic study/4_1 semester/AI LAB/Lab 2/T4.pl compiled 0.00 sec, 1 clauses
?- factorial(0,Result).
Result = 1 ,

?- factorial(5,Result).
Result = 120
Unknown action: f (h for help)
Action? ,

?- factorial(10,Result).
Result = 3628800
```

Example 5.:

Problem Name :Descendant.

Clause:

```
child(anna,bridget).
child(bridget,caroline).
child(caroline,donna).
child(donna,emily).
descend(X,Y):-child(X,Y).
descend(X,Y):-child(X,Z),descend(Z,Y).
```

Queries and Result:

```
% e:/academic study/4_1 semester/AI LAB/Lab 2/T5.pl compiled 0.00 sec, 6 clauses
?- descend(anna,donna).
true .

?- descend(A,B).
A = anna,
B = bridget ;
A = bridget,
B = caroline ;
A = caroline,
B = donna ;
A = donna,
B = emily ;
A = anna,
B = caroline ;
A = anna,
B = donna ;
A = anna,
B = emily ;
A = bridget,
B = donna ;
A = bridget,
B = emily ;
A = caroline,
B = emily ;
false.

?-
```

Example 6:

Problem Name :List

Query and Result:

```
?- [Head|Tail]=[mia,jordi,yolanda,karim,rakib].
Head = mia,
Tail = [jordi, yolanda, karim, rakib].
```

Example 7:

Problem Name :Anonymous Variable

Clause:

[X1,X2,X3,X4|Tail] = [mia, vincent, marsellus, jody, yolanda].

Queries and Result:

```
?- [X1,X2,X3|Tail]=[mia,jordi,rabbi,amin,kalam].
X1 = mia,
X2 = jordi,
X3 = rabbi,
Tail = [amin, kalam].

?-
```

Example 8:

Problem Name :Membership in list.

Clause:

?member(b,[a,b,c]).
member(b,[a,[b,c]]).
member([b,c],[a,[b,c]]).

Queries and Result:

```
?- member([b,c],[a,[b,c]]).
true.

?- member(b,[a,b,c]).
true .

?- member(b,[a,[b,c]]).
false.

?- member([b,c],[a,[b,c]]).
true.

?-
```

Example 9:

Problem Name :Concatenation in list.

Clause:

concat_lists(L1, L2, Concat) :- append(L1, L2, Concat).

Queries and Result:

```
% e:/academic study/4_1 semester/AI LAB/Lab 2/T6.pl compiled 0.00 sec, 1 clauses
?- concat_lists([a,b,c],[mia,yolanda],Concat).
Correct to: "concat_lsits([a,b,c],[mia,yolanda],Concat)"?
Please answer 'y' or 'n'? yes
Concat = [a, b, c, mia, yolanda].
```

Example 10:

Problem Name:Deleting last item from a list.

Clause:

```
delete_last([_], []).
delete_last([Head|Tail], [Head|NewTail]) :- delete_last(Tail, NewTail).
```

Queries and Result:

```
?-
% e:/academic study/4_1 semester/AI LAB/Lab 2/T7.pl compiled 0.00 sec, 2 clauses
?- delete_last([1,2,3,4,5],L).
L = [1, 2, 3, 4]
```

Example 11:

Problem Name :Deleting an Item from a list.

Clause:

```
delete_item(X,[X|Tail],Tail).
delete_item(X,[Y|Tail],[Y|Tail1]):-delete_item(X,Tail,Tail1).
```

Queries and Result:

```
?- delete_item(a,[d,b,a,c],New_list).
New_list = [d, b, c]
```

Example 12:

Problem Name :Adding an item.

Clause:

```
add_item(Item, List, NewList) :- append(List, [Item], NewList).
```

Queries and Result:

```
% e:/academic study/4_1 semester/AI LAB/Lab 2/T9.pl compiled 0.00 sec, 0 clauses
?- add_item(dena,[hiyana,dona,mia],X).
X = [hiyana, dona, mia, dena].
```

Example 13:

Problem Name :Implement a Prolog predicate 'equal_length/2' that takes two lists as input and succeeds if both lists have the same length.Give some example queries and their expected outputs.

Clause:

```
equal_length([],[]).
equal_length([_|T1],[_|T2]):-equal_length(T1,T2).
```

Queries and Result:

```
% e:/academic study/4_1 semester/AI LAB/Lab 2/T10.pl compiled 0.00 sec, 2 claus
es
?- equal_length([],[]).
true.

?- equal_length([1,2,3],[a,b,c]).
true.

?- equal_length([1,2,3],[a,b,c,d]).
false.

?- equal_length([a,b,c],[1,2,3]).
true.

?-
```

Example 14:

Problem Name :**Write a Prolog predicate 'maximum/3' that takes three integers as input and returns the maximum of the three.**

Clause:

```
maximum(X, Y, X) :- X >= Y.
maximum(X, Y, Y) :- X < Y.
```

Queries and Result:

```
?-
% e:/academic study/4_1 semester/AI LAB/Lab 2/T11.pl compiled 0.00 sec, -1 clau
ses
?- maximum(10,100,X).
X = 100.

?- maximum(18,25,Y).
Y = 25.

?- maximum(56,67,K).
K = 67.

?-
```

Example 15:

Problem Name :**Write a Prolog predicate to find the length of a list**.

Clause:

```
list_length([], 0).
list_length([_|T], Length) :-
    list_length(T, RestLength),
    Length is RestLength + 1.
```

Queries and Result:

```
?-
% e:/academic study/4_1 semester/AI LAB/Lab 2/T12.pl compiled 0.00 sec, 0 claus
es
?- list_length([], Length).
Length = 0.

?- list_length([a, b, c], Length).
Length = 3.

?- list_length([1, 2, 3, 4, 5], Length).
Length = 5.

?- list_length([a], Length).
Length = 1.

?-
```