

GHARDA FOUNDATION
GHARDA INSTITUTE OF TECHNOLOGY, LAVEL
Department of Computer Engineering

Evaluation Sheet

Class: TE-Computer Engineering

Sem: VI

Subject: **Artificial Intelligence Lab(CSL604)**

Experiment No: 8

Title of Experiment: Study the implementation of logical programs using PROLOG.

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Roll No: 68

Date of Performance: 01/03/2023

Sr. No.	Evaluation Criteria	Max Marks	Marks Obtained
1	Practical Performance	8	
2	Oral	5	
3	Timely Submission	2	
	Total	15	

Signature of Subject Teacher
(Prof. M. A. Khandke)

1) Program to perform Arithmetic Operations –

```
add(X, Y, Z) :- Z is X + Y.  
subtract(X, Y, Z) :- Z is X - Y.  
multiply(X, Y, Z) :- Z is X * Y.  
divide(X, Y, Z) :- Z is X / Y.
```

Output –



The screenshot displays a Prolog interpreter interface with four separate execution blocks. Each block contains a query followed by the result. The queries are: `add(5, 5, Result).`, `subtract(10, 5, Result).`, `multiply(10, 5, Result).`, and `divide(10, 5, Result).`. The corresponding results are: `Result = 10`, `Result = 5`, `Result = 50`, and `Result = 2`. Each block has a gear icon on the left and control buttons (down arrow, minus, and close) on the right.

2) Program to check the number is even, odd or prime –

```
is_even(X) :-  
    X mod 2 == 0.  
  
is_odd(X) :-  
    X mod 2 == 1.  
  
is_prime(X) :-  
    X > 1,  
    Upper is floor(sqrt(X)),  
    \+ (between(2, Upper, Y), X mod Y == 0).
```

Output –



The screenshot shows a Prolog interpreter window with several query results. Each query is in a separate row, with a gear icon on the left and control buttons (down arrow, minus, close) on the right. The results are displayed in red text below each query.

Query	Result
<code>is_even(7).</code>	false
<code>is_even(8).</code>	true
<code>is_odd(8).</code>	false
<code>is_odd(9).</code>	true
<code>is_prime(10).</code>	false
<code>is_prime(13).</code>	true

3) Program to calculate factorial of a number –

```
factorial(0, 1).  
factorial(N, Result) :-  
    N > 0,  
    Prev is N - 1,  
    factorial(Prev, PrevResult),  
    Result is N * PrevResult.
```

Output –



The screenshot shows a Prolog interpreter window with several factorial queries. Each query is in a separate row, with a gear icon on the left and control buttons (down arrow, minus, close) on the right. The results are displayed in red text below each query.

Query	Result
<code>factorial(5, Result).</code>	Result = 120
<code>factorial(10, Result).</code>	Result = 3628800
<code>factorial(3, Result).</code>	Result = 6
<code>factorial(7, Result).</code>	Result = 5040

4) Program to find the greatest among three numbers –

```
greatest(X, Y, Z, G) :-  
    X >= Y, X >= Z,  
    G is X.  
greatest(X, Y, Z, G) :-  
    Y >= X, Y >= Z,  
    G is Y.  
greatest(_, _, Z, G) :-
```

Output –




The screenshot shows a Prolog interpreter window with three separate query boxes. Each box contains a query and its result. The first query is `greatest(10, 5, 20, Result).` with the result `Result = 20`. The second query is `greatest(3, 5, 1, Result).` with the result `Result = 5`. The third query is `greatest(13, 5, 1, Result).` with the result `Result = 13`. The third query box is highlighted with a black border.

```
greatest(10, 5, 20, Result).  
Result = 20  
greatest(3, 5, 1, Result).  
Result = 5  
greatest(13, 5, 1, Result).  
Result = 13
```

5) Program to solve the problem of Tower Of Hanoi (TOH) –

```
move(1,X,Y,_) :-  
    write('Move top disk from '), write(X), write(' to '), write(Y), nl.  
move(N,X,Y,Z) :-  
    N>1,  
    M is N-1,  
    move(M,X,Z,Y),  
    move(1,X,Y,_),  
    move(M,Z,Y,X).
```

Output –

 `move(3, left, right, center).`



Move top disk from left to right
Move top disk from left to center
Move top disk from right to center
Move top disk from left to right
Move top disk from center to left
Move top disk from center to right
Move top disk from left to right

true

1