		<b>Finolex Academy of Management and Technology, Ratnagiri</b>	
		<b>Department of Information Technology</b>	
Subject name: Intelligent Systems Labs			Subject Code: BEITC703
Class	BE IT	Semester – VII (CBGS)	Academic year: 2019-20
Name of Student	<b>Kazi Jawwad A Rahim</b>	<b>QUIZ Score :</b>	
Roll No	<b>29</b>	Assignment/Experiment No.	07
Title: <b>To implement basic programs using PROLOG.</b>			


<b>1. Course objectives applicable:</b> COB5 Apply of basics of PROLOG programming.
<b>2. Course outcomes applicable:</b> CO5 –To study how to do programming in Artificial Intelligence using PROLOG.
<b>3. Learning Objectives:</b> <ol style="list-style-type: none"> <li>To understand expressions, operators, functions in PROLOG.</li> <li>To use PROLOG for programming in AI.</li> <li>To learn how to represent relations using PROLOG.</li> </ol>
<b>4. Practical applications of the assignment/experiment:</b> Used in development of algorithms based on Knowledge Base like Robot.
<b>5. Prerequisites:</b> <ol style="list-style-type: none"> <li>To learn knowledge base.</li> <li>To understand how knowledge base agent behaves and performs.</li> <li>To use First order and propositional logic.</li> </ol>
<b>6. Hardware Requirements:</b> <ol style="list-style-type: none"> <li>PC with minimum 2GB RAM</li> </ol> <b>7. Software Requirements:</b> <ol style="list-style-type: none"> <li>Windows installed</li> <li>PROLOG installed</li> </ol>

<b>8. Quiz Questions (if any): (Online Exam will be taken separately batch wise, attach the certificate/ Marks obtained)</b> <ol style="list-style-type: none"> <li>What do you mean by First order logic?</li> <li>What is the extension for programs written in PROLOG?</li> <li>Complex problems can be solved by using FOL(True or False)?</li> <li>What do you mean by semantics?</li> </ol>
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<b>9. Experiment/Assignment Evaluation:</b>			
Sr. No.	Parameters	Marks obtained	Out of
1	Technical Understanding (Assessment may be done based on Q & A <u>or</u> any other relevant method.) Teacher should mention the other method used -		6
2	Neatness/presentation		2
3	Punctuality		2
Date of performance (DOP)		Total marks obtained	10
Date of checking (DOC)		Signature of teacher	

## 11. Programs and result

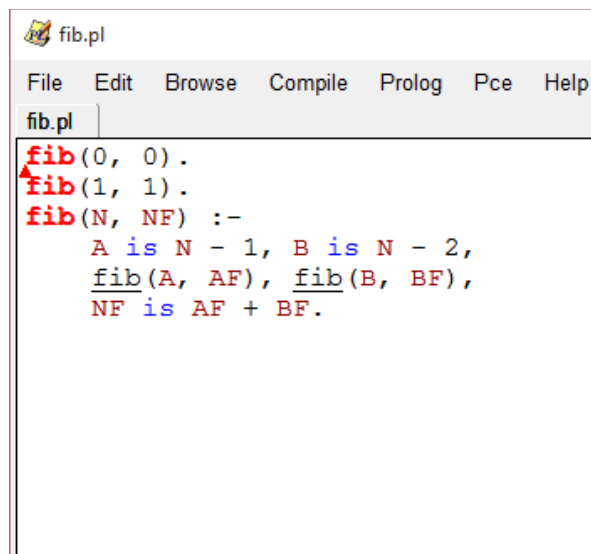
### 1. Factorial of a number using prolog.

 fact.pl  
File Edit Browse Compile Prolog Pce Help  
fact.pl  

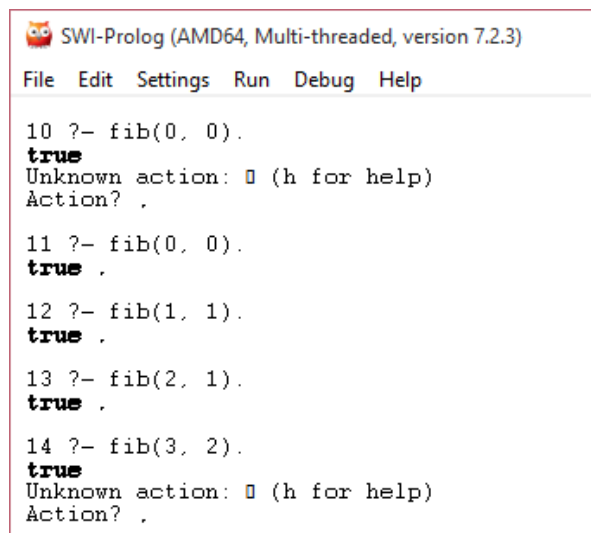
```
^factorial(0,1) .  
  
factorial(N,F) :-  
    N>0,  
    N1 is N-1,  
    factorial(N1,F1),  
    F is N * F1.  
  
factorial(0,F,F) .  
  
factorial(N,A,F) :-  
    N > 0,  
    A1 is N*A,  
    N1 is N -1,  
    factorial(N1,A1,F) .
```

 SWI-Prolog (AMD64, Multi-threaded, version 7.2.3)  
File Edit Settings Run Debug Help  
Welcome to SWI-Prolog (Multi-threaded, 64 bits, Version 7.2.3)  
Copyright (c) 1990-2015 University of Amsterdam, VU Amsterdam  
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software,  
and you are welcome to redistribute it under certain conditions.  
Please visit <http://www.swi-prolog.org> for details.  
  
For help, use ?- help(Topic). or ?- apropos(Word).  
  
1 ?- factorial(0,1).  
**true** .  
  
2 ?- factorial(5,120).  
| factorial(5,120).  
**true** .  
  
3 ?- factorial(5,100).  
**false**.

## 2.Fibonacci series using prolog.



```
fib.pl
File Edit Browse Compile Prolog Pce Help
fib.pl
fib(0, 0).
fib(1, 1).
fib(N, NF) :-
    A is N - 1, B is N - 2,
    fib(A, AF), fib(B, BF),
    NF is AF + BF.
```



```
SWI-Prolog (AMD64, Multi-threaded, version 7.2.3)
File Edit Settings Run Debug Help

10 ?- fib(0, 0).
true
Unknown action: (h for help)
Action? .

11 ?- fib(0, 0).
true .

12 ?- fib(1, 1).
true .

13 ?- fib(2, 1).
true .

14 ?- fib(3, 2).
true
Unknown action: (h for help)
Action? .
```

## 12. Learning Outcomes Achieved

1. Understood programming in PROLOG.
2. Implemented basic programs in AI using PROLOG.

## 13. Conclusion:

### 1. Applications of the studied technique in industry

- a. Development of algorithms in machine learning.
- b. expert systems
- c. specification language
- d. machine learning
- e. robot planning
- f. automated reasoning

### 2. Engineering Relevance

- a. Such algorithms are used to develop algorithms for complex problems.

### 3. Skills Developed

- a. Implementation of programs using PROLOG

#### **14. References :**

- [1] G. Görz, C.-R. Rollinger, J. Schneeberger (Hrsg.) “Handbuch der künstlichen Intelligenz” Oldenbourg Verlag, 2003, Fourth edition
- [2] Turing, A. "Computing Machinery and Intelligence", Mind LIX (236): 433–460, October, 1950.
- [3] Aristotle “On Interpretation”, 350 B.C.E, see:  
<http://classics.mit.edu/Aristotle/interpretation.html>
- [4] Artificial Intelligence: A modern approach, Stuart Russel and Peter Norvig, Pearson.
- [5] Artificial Intelligence, Elaine Rich and Kevin Knight, Tata McGraw.
- [6] Principles of Artificial Intelligence, Nils J. Nilson, Narosa Publications.
- [7] Basics of PROLOG available at  
<http://www.cse.unsw.edu.au/~billw/cs9414/notes/prolog/facts03>