Laboratory Manual

for

Artificial Intelligence

B.E. (COMPUTER)
SEM VIII

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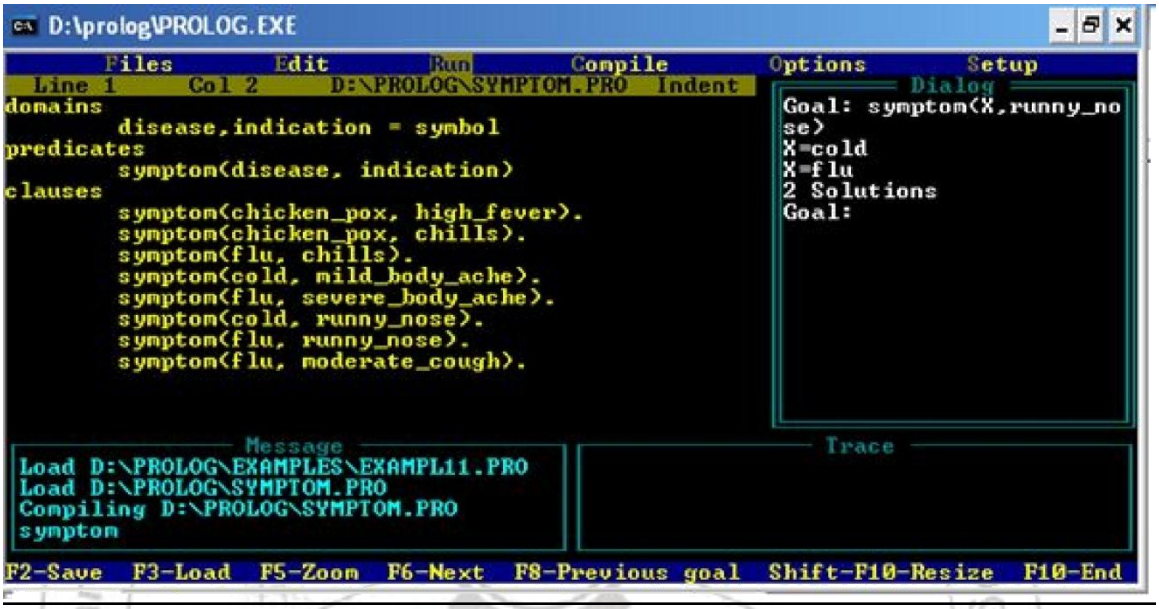
EXPERIMENT – 1

AIM:TurboProlog features and format.

LOGIC:

Write a simple prolog program to study fact, verification, domain, predicate and clauses section.(Refer book page no 41)

OUTPUT:



EXPERIMENT – 2

AIM:WAPusing variables in Prolog.

Write a Prolog program containing facts related to following predicates

1.Location (city, state)

2.Stays (person, city)

Display:

(i) list of person, state and city

(ii) Given person staying in which state.

LOGIC:

Write clauses Location (city, state) andStays (person, city)

OUTPUT:

(i) Person= ram City=anand State=Gujarat
Person= Lakshman City=anandState=Gujarat
Person= Seeta City=Baroda State=Gujarat
(ii) Person= ram State=Gujarat

EXPERIMENT – 3

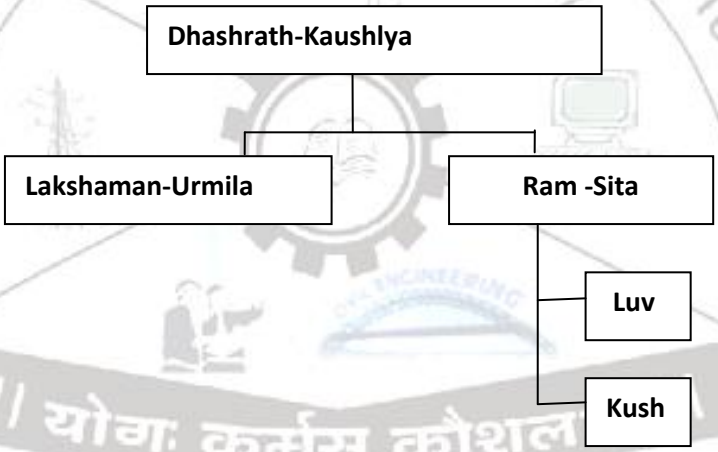
AIM:WAP for Usage of rules in Prolog.

Create a family tree program(of EXP2) to include following rules

1. **M is the mother of P *if* she is a parent of P and is female**
2. **F is the father of P *if* he is a parent of P and is male**
3. **X is a sibling of Y *if* they both have the same parent.**
4. **Then add rules for grandparents,uncle-aunt,sister and brother .**

Based on the facts , define goals to answer questions related to family tree

LOGIC: Consider this relation tree



OUTPUT:

Goal :-grandfather(Luv,X)
X=Dashrath
Goal:-uncle(Luv,X)
X=Lakshman
Goal:-father(Luv,X)
X=Ram
Goal:-sibling(Luv,X)
X=Kush
Goal:-aunt(Luv,X)
X=Urmila

EXPERIMENT – 4

AIM:-

(1)WAP for using Input, Output and fail predicates in Prolog.

Display:

(i)list of married & unmarried employees

(ii)List of male & female employees

(iii)List of employees for given job location

(2)Create a small set of facts and rules on who is the ancestor of whom.

Display:

(i) who is ancestor of given person.

(ii)Complete list i.e who is ancestor of whom

LOGIC:

Store facts of employee name, age, job location, marital status and gender. Write program using write, writef, readint,readchar,readln ,readreal predicates

OUTPUT:

Solution (1):

Example:-

1. Display list of married employees
2. Display list of unmarried employees
3. Display list of male employees
4. Display list of female employees
5. Display list of employees at a given location

Enter your choice:-
5
Enter location :-Anand
List of employees staying at "anand" are
SrNo.Name of employee
1. Ram
2. Lakshman
……

Solution(2):

Example:-

With reference to above given family tree in experiment no.3

OUTPUT:

Input person's name-Luv

Ancestors of "luv" is-Ram ,Lakshman

Person	**Ancestor**
Luv	Ram ,Lakshman
Ram	Dashrath
Lakshman	Dashrath,

EXPERIMENT – 5

AIM:Write programs for studying Usage of arithmetic operators in Prolog.

(1)Accept name of the student, rollno, his/her subject name ,maximum marks and obtained marks in the subject. (Take marks of atleast 6 subjects). Compute the percentage of a student. Display his result with other information.

(2) Accept department, designation, name, age, basic salary, house rent allowance(HRA) of an employee . Compute dearness allowance (DA) which is 15% of basic salary . Determine the gross salary(basic salary+HRA+DA) of the employee. Display all information of the employee(Generate Payslip).

LOGIC:

For making the program use variables, arithmetic operator, I/O predicates appropriately.

OUTPUT:
Solution(1):
Example:
Enter name of student:- "ram"
Enter roll number of student-Cp1
Enter subject information for 6 subjects:-

Subject name	Max marks	Obtained marks
DAA	150	120
OOPD	150	110
CN	150	100
DC	150	100
AMP	150	140
CPI	150	30

Student name:-"ram" Roll no-"Cp1"
Subject names-DAA, OOPD, CN, DC, AMP, CPI
Total max marks-….Total Obtained marks- ….
%Percentage - ……

Solution(2):

Example:-

Enter employee name: - xyz
Enter department :-IT Enter age:-43
Enter basic salary-50,000
Enter HRA:- 2000

PAYSLIP

Employee Name is –
xyz Department-IT
BA-50,000
DA - 7500
HRA-2000
Gross salary- 59500/-

EXPERIMENT – 6

AIM:WAP to study usage of cut,not,fail predicates in Prolog.

Write a Prolog program having facts in clauses section for predicate student(studentname,branchname).

Display:

(i)list of all students

(ii)list of students for given specific branch.

(iii)list of students excluding specific branch

LOGIC:

Use cut !, fail, not predicates for this program.

OUTPUT:

Example:-

```
**********MENU**********
1)Display list of all students
2)Display list of students for given specific branch.
3)Display list of students excluding specific branch
Enter your choice-
3
Enter branch name to be excluded from result -
CE
List of all students except from CE branch are -
Student name- Department
Harsh -IT
Deep-EC
Heena-IC
```

EXPERIMENT – 7

AIM:WAP to study usage of Recursion inProlog.

(1)Write program which finds and display factorial of a given number.

(2)Write program which display Fibonacci series.

LOGIC:

For finding the factorial of a given number use function "fact" and for displaying Fibonacci series use function "fibo".

OUTPUT:

Solution(1):

Example:-

fact(5)

5 != 5*4*3*2*1= 120 .

OUTPUT:

Solution(2):

Example:-

Total number of numbers needed in output? 6

Fibonacci series of first '6' numbers:-"1,1,2,3,5,8"

EXPERIMENT – 8

AIM:WAPto study usage of logical , arithmetic ,string operators in Prolog

(1)Write a program which finds and displays maximumnumberand minimum number from three given numbers.

(2)Write a program which accepts integer number as an input and displays its square .It should also find its positive square root value ,if its square root is integer, otherwise display 'NA'.

(3)Write a program to find substring from a given string. The substring should start from 1st location of source string and should contain the entered number of characters from the source string.

LOGIC:

Use appropriate function for finding minimum number ,maximum number ,square root and substring. Use logical operators.

OUTPUT:

Solution(1):

Example:-

Enter three numbers : 1 2 3

maximum is "3" , minimum is "1"

Solution(2):

Example1 :-

Enter no. : 3

3(number) , 9 (square) ,NA(square root not possible)

Example2 :-

Enter no. 4

4 (number), 16 (square) , 2(square root)

Solution(3):

Example:

Enter source string: "tested"

Enter number of characters needed in substring: "4"

Original String is : "tested"

Substring is :"test"

EXPERIMENT – 9

AIM:WAP for studying usage of compound object and list in Prolog.

(1)Write a program to maintain inventory items using a compoundobject:

(i) Accept from user the details of atleast 10 objects.

(ii)Display from user the details of objects entered by user

(2)Find and display odd and even numbers from a given input list.

LOGIC:

The format of compound object should be:

(item type, item (no, description, qty, cost))

Item-type can be Fg-finish good, Sf-semi finish good, Rm-raw material.
Do the following:

OUTPUT:

Solution(1):

Example:-

Enter information of 10 type:
Enter item type…….
Enter item number…….
Enter item……..
Description…….
Enter quantity of item……
……
……
Display of the objects as follows:

Item typeItem number		description	quantity	cost
Fg	1	keyboard	10	2000
Rm	2	plasticbox	10	300
Sf	3	keypad	10	500

Solution(2):

Example:-

Enter list of 10 integer numbers
1,2,3,4,5,6,7,8,9,10
Even number -> 2,4,6,8,10

Odd numbers-> 1,3,5,7,9
Odd numbers-> 1,3,5,7,9

EXPERIMENT – 10

AIM:WAP for studying usage of Dynamic database in Prolog.

Write a program for maintaining student information using Dynamic database.

Display:

(i) Store facts ofstudent(name, branch, semester, percentage) dynamically.
(ii)Use assert predicate to enter new data in dynamic database.
(iii)Use retract predicate to delete a given data from dynamic db.
(iv)Create appropriate predicate to search and display some specified students details.
(v)Create appropriate predicate to list all the students having percentage greater than some specified value.

OUTPUT:
Example:-

**********MENU**********

1) enter new student details
2) delete a student data
3) display specific student details
4) list of students having % greater than specified %
5) Exit

Enter your choice:-4
Enter minimum % - 60
The student details having % greater than "60 " are

Std name	stdbranch	semester	%
Ram	IT	7	61
Lakshman	CE	7	69

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