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Artificial Intelligence LAB MANUAL

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EXPERIMENT - 1

AIMrTurboProlog features and format.

LOGIC:

Write a simple prolog program to study fact, verification, domain,

predicate and clauses section. (Refer book page no 41)

OUTPUT:

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disease

predicates

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bes

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svnpton<fIu, severe \_hody\_ache ) .

synpton<cold. runny\_nose>.

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F2-Sauc P3-Load FS-Zoon F6-Next FS-Preuious

' ptions Setup

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Goal: symptom<X,ruriny\_no

se>

X-cold

X-f lu

2 Solutions

Goal:

Trace

Shift-FIB-Resize F10-End

1

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EXPERIMENT - 2

AIMrWAPusing variables in Prolog.

Write a Prolog program containing facts related to following

predicates

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 f'-=^=r

1. Location (city, state)

2.Stays (person, city)

Display:

(i) list of person, state and city

(ii) Given person staying in which state.

LOGIC:

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EXPERIMENT - 3

AIMrWAP 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 i/"he is a parent of P and is male

3. X is a sibling of Y i/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

/

/

Dhashrath-Kaushlya

Lakshaman-Urmila

a i\

Ram -Sita

Luv

' Kush

OUTPUT:

Goal :-grandfather(Luv,X)

X=Dashrath

Goal:-uncle(Luv,X)

X=Lakshman

Goal:-fatlier(Luv,X)

X=Ram

Goal:-sibling(Luv,X)

X=Kush

Goal:-aunt(Luv,X)

X=Urmila

EXPERIMENT - 4

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AIM:-

(l)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:

J

Store facts of employee name, age, job location, marital status and gender.

Write program using write, writef, readint,readchar,readln ,readreal

predicates t |L \ ^ \

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):

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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

Luv

Ram

Lakshman

Ancestor

Ram ,Lakshman

Dashrath

Dashrath,

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EXPERIMENT - 5

AIMrWrite 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 employ ee(Generate Payslip).

LOGIC: ^

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

appropriately. ' , . \

OUTPUT:

Solution(l): ^

Example:

Enter name of student:- "ram"

Enter roll number of student-Cpl

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-"Cpl"

Subject names-DAA, OOPD, CN, DC, AMP, CPI

Total max marks- . . . .Total Obtained marks- ....

%Percentage -

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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/-

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EXPERIMENT - 6

AIMrWAP 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

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EXPERIMENT - 7

AIMrWAP to study usage of Recursion inProlog.

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

number.

(2) Write program which display Fibonacci series.

For finding the factorial of a given number use function "fact" and for

displaying Fibonacci series use function "fibo".

5 1=5\*4\*3\*2\*1= 120. -

OUTPUT: / c

Solution(2):

Example :-

Total number of numbers needed in output? 6

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

LOGIC:

OUTPUT:

Solution(l):

Example :-

fact(5)

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EXPERIMENT - 8

AIMrWAPto study usage of logical , arithmetic ,string operators in Prolog

(l)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 1^\* 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(l):

Example :-

Enter three numbers : 1 2 3

maximum is "3" , minimum is "1"

Solution(2):

Examplel :-

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"

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EXPERIMENT - 9

AIMrWAP for studying usage of compound object and list in Prolog.

(l)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(l): |( "f ^

Example:- ^' \

Enter information of 10 type: ' \ c

Enter item type ^ ^

Enter item number

Enter item

Description

Enter quantity of item.

Display of the objects as follows:

Item typeltem 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

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

Oddnumbers-> 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: .4 rj^i

Example:- • j^. iffl '

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 stdbranchsemester %

Ram IT 7 61

LakshmanCE 7 69

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