**Course : Artificial Intelligence**

**Code: 13 CS 304**

**Lab manual**

Prolog projects basically depends on the knowledge to derive goals, the major contribution is on collecting the facts and converting them into declarative knowledge i.e prolog facts, required to find the solution for the goals.

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| **Team of faculty** |  |
| Dr. M S R.PRASAD | coordinator |
| Dr. C M VELU | instructor |
| Dr. T N SHANKAR | instructor |
| Mr. G V S PRASAD | instructor |
| Mrs. P L PRSANNA | instructor |
| Miss M ANILA | instructor |

**List of Experiments**

1. **Mary problem**
2. **Family relations problem**
3. **Games problem**
4. **temperature conversion problem**
5. **looping problem**
6. **factorial recursion problem**
7. **print \*s in the following pattern with loping**

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**\*\*\***

**\*\***

**\***

1. **8. print \*s in the following pattern with loping**

**\*\*\*\***

**\*\*\*\***

**\*\*\*\***

**\*\*\*\***

1. **Change for a rupee/dollar.**
2. **Loop with repeat predicate**
3. **Program on cut predicates**
4. **Program on cut and fail predicates**
5. **Fibonacci sequence**
6. **List program1**
7. **List program 2**
8. **List program 3**
9. **Monkey banana problem**
10. **Towers of Hanoi problem**

**Project 1- solar system**

**Description :** This project is a database of our solar system, along with a few stars outside our solar system. It includes details such as the object classification (star/planet/moon), as well as some attributes of the objects (what it orbits/density/diameter).

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. Galaxy/1
2. Planet/1
3. Diameter/2
4. Prepare goal for name of the galaxy
5. Prepare goal for names of the plants?
6. Prepare goal for density of the given term

**Module 2 :**

1. Star/1
2. Moon/1
3. Density/2
4. Prepare goal for names of the stars?
5. Prepare goal for names of the moons?

**Module 3:**

1. Comet/1
2. Orbits/2
3. Prepare goal for names of the comets
4. Prepare goal for names of the orbits
5. Prepare goal for diameter of the given term

goals: should write the goals for

1. denserthan(A,B)
2. largerthan(A,B)
3. asatelliteof(A,B)

**Project2 - states and capitals**

**Description:** This database has a lot of information in it. It first states all of the fifty US states. Then it defines all of those states' capitals. Then it shows the small states, which is defined as any state with fewer than 10,000 square feet. A medium state has in-between 10,000 and 100,000 square feet. Of course, leaving the large states at over 100,000 square feet. After those it moves to the capitals, specifically the size of the population. The small, medium, and large Capital Population fields are defined. A small capital has fewer than 100,000 people. Medium has in-between 100,000 and 500,000 people. Therefore, large has above 500,000 people. Next it goes on to give the population of each capital city. Then it shows which region each state is in. There is the west, midwest, south, northeast and pacific regions.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. state /1
2. capital/2
3. west /2
4. Prepare goal for all states
5. Prepare goal for all capitals

**Module 2 :**

1. smallState /2
2. mediumState /1
3. largeState/2
4. Midwest/1
5. pacific/1

**Module 3:**

1. largeCapitalPop /2
2. mediumCapitalPop /2
3. smallCapitalPop/2
4. capitalPop /2
5. south /1
6. northeast

**goals**: should write the goals for

1. iscapital(I):- 2. issmallcapital(I):- 3. ispacific(I):-

**Project 3 - Employess database system**

**Description :** The idea is to be able to type in part of the employee information and retrieve different information about the employee. database has several instance data fields: these data fields are Last Name, First Name, Employee ID Number, Gender, and Phone Number. It should be noted that I made all this up.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. person /6
2. salary /2
3. Prepare goal for all details of every employee
4. Prepare goal for all first names
5. Prepare goal for all phone numbers

**Module 2 :**

1. givenname /2
2. idN /2
3. birthDate /2
4. Prepare goal for showing the last name when first name is given
5. Prepare goal for showing the id number when last name is given

**Module 3:**

1. phoneNumber /2
2. gender/2
3. Prepare goal to show phone numbers of all female employees
4. Prepare goal to show phone numbers of all male employees
5. Prepare goal to show salaries of all female employees
6. Prepare goal to show salaries of all male employees

**Project 4 – learning names quickly**

**Description :** You can choose any number of individuals and give them different attributes. Sex is entered as m or f. The color of hair is given as blonde, brown, black, red, or bald. The color of their shirt was given as white or black (in this case). When identifying glasses or not, the input was y or n. This database tool would be very helpful for those new to an environment, helping them to learn names and characteristics of each person.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. person /2
2. Prepare goal for all first names
3. Prepare goal for all last names
4. Prepare goal for to give whether the name is in the database or not

**Module 2 :**

1. sex /2
2. glasses /2
3. Prepare goal to show all the students with eye ware.
4. Prepare goal to show all the students with eye ware and wearing blue shirt
5. prepare a goal to list all female students
6. Prepare a goal to list all male students
7. Prepare goal for showing the sex of a person when last name is given

**Module 3:**

1. hair /2
2. shirtcolor /2
3. Prepare goal to show all gray hair students
4. Prepare goal to show all blond hair students
5. Prepare goal to show all male blond hair students

**Project 5 – car purchase**

**Description :** The database consists of automobiles, regions, and companies. The regions are assigned to the companies based on the locations of the companies. The companies are assigned to the automobiles based on which company manufactures the particular automobile. Each automobile also has a set of characteristics. These characteristics include the class of the automobile, the type of transmission, the number of doors, whether or not it is convertible, the layout, the number of cylinders in the engine, and if it has a sunroof.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. automobile/1
2. company /1
3. locatedin /2
4. cylinders /2
5. Prepare goal show the companies located in asia

**Module 2:**

1. manufacturedby /2
2. class /2
3. sunroof /2
4. transmission /2
5. Prepare goal for to show all manufacturers
6. Prepare goal for to show vehicles with 4 cylinders with sunroof

**Module 3:**

1. doors /2
2. convertible /2
3. layout /2
4. Prepare goal for to show vehicles with 2 doors and fwd(front wheel drive)
5. Prepare goal for all vehicles with sunroof exists

**Project 6 – players database**

**Description :** The database contains the first and second string players for each team in the NFL North division. Each team has the quarterback, running back, wide receiver, and tight end positions. The main facts of each player are what team the particular player plays for, his position, and the points they are projected to get during week four of the NFL season. The Vikings players projected points are for week five because they have a bye during week four, meaning they are not playing during week 4. Also, each team's bye week is displayed.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. player /2
2. Prepare goal to show all the players
3. Prepare goal to show all the players who are running back
4. Prepare goal to show all the players who are wide receiver
5. Prepare goal for Who are the team2 receivers?

**Module 2:**

1. team /2
2. Prepare goal to show all the teams
3. Prepare goal for all the players of team1
4. Prepare goal for to show all the players of team2
5. Prepare goal for What is the projection of player1 of team 1?

**Module 3:**

1. bye /2
2. projected /2
3. Prepare goal for all the byes available for team1
4. Prepare goal for all the byes available for team2
5. Prepare goal for all the byes available for team3
6. Prepare goal for Who are the team1 running back players?

**Project 7- library books**

**Description :** The database is broken up into several parts. There is the "authorOf" category which contains the author's name and the title of a book they've written. It has "fiction", "nonFiction", and "reference" fields with book titles. The database also includes fields for the publisher names and books associated with them, fields for checking if the author writes fiction, nonfiction, or reference books, and a field to sync the publisher to the author. With these fields the user can find any other piece of information from any one piece.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. authorOf/2
2. publisherOf /2
3. goal, authorof(name, E) gives the title when author name is known
4. Prepare goal for to show all the authors
5. Prepare goal to show all the titles of the books
6. Prepare goal for to show all the publishers

**Module 2:**

1. fiction/1
2. nonfiction/1
3. Prepare goal for Who are the non fiction authors?
4. Prepare goal for Who are the fiction authors?
5. Pubauthors can tell user the author if the publisher is known, or publisher if the author is known.

**Module 3:**

1. reference/1
2. Prepare goal for Who are the reference authors ?
3. Prepare goal for all references?
4. Prepare goal for whether it is reference or not?
5. Prepare goal for books published by known publisher

**Project 8 - Employee promotion**

**Description :** This project interprets a database of employees and determines what type of raise, or promotion said employee deserves. The raise is calculated based on performance. Promotion is calculated by performance and whether the boss likes the employee (and vice versa)! Just like in real life employment, it "pays" to be liked.

This database stores employees of a company, who their bosses are, who they supervise, who likes them, and who they like. With this information and my rules, prolog will calculate the employees raise percentage and promotion worthiness.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. boss/2 ; boss(x,y) means X is the boss of Y.
2. employee /1
3. salary rise if employee is a hard worker , 5%
4. salary rise if employee is a slaker , 2%
5. Prepare goal to Show all employees

**Module 2:**

1. Likes/2; likes (x,y) means X likes Y.
2. determines if boss likes Employee
3. determines if employee likes boss
4. determine who are liking whom
5. Prepare goal to show all the bosses

**Module 3:**

1. hardWorker/1
2. Slacker/1
3. goal for the promotion
4. goal for the raise
5. Determine raise or promotion
6. Determine to show all slakers

**Project 9 – meat shop**

**Description :** The database contains facts pertaining to various meats, the brand that processes them, and their flavor. It also contains rules of their relationships such as which meats have which flavors or which brands have which meats and which flavors. Through this, we can determine, what meats may best suit the customer.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. meat /1
2. show all meats
3. X is a cheap meat
4. X is the best value
5. meat\_flavor/2
6. brand\_has /3

**Module 2:**

1. brand /1
2. X is the best meat
3. Show all flavors
4. Say whether it is a flavor
5. X is an expensive meat

**Module 3:**

1. flavor /1
2. Y is an expensive flavor
3. X is a tasty meat
4. Show all meat flavors
5. Show all tasty meats

**Project 10 – who has the best car**

**Description :** This database having number of cars, list of drivers who drives those cars. Every car with a brand name have special features in them. From those features decide which car is rich, poor, sports. This decision depends on your rules, that you frame.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. car /1
2. person /1
3. who are all drivers
4. what are all cars
5. X is a poor car

**Module 2:**

1. drives /2
2. brand\_has /3
3. all the features of the first car
4. feature1 with what cars
5. X is a sports car
6. X is a clean car

**Module 3:**

1. has /2
2. brand\_has /3
3. X is an expensive car
4. X is a fast car
5. X is a rich car

**Project 11- family tree**

**Description :** this database defines who are male and who are female. For every person gives the details of father and mother. Take your choice of family tree and write the rules for all goals.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. Male/1
2. All males
3. All fathers
4. All grand fathers
5. Who is the cousin of whom

**Module 2:**

1. Female/1
2. All females
3. All mothers
4. All grand mothers
5. Who is the grand son of whom
6. Who is the grand daughter of whom

**Module 3:**

1. Parent/2
2. All parents
3. Who is the parent of whom
4. Who is the mother of whom
5. All the relatives

**Project 12 – Student information system**

**Description :** Write a complete prolog program to read a list of 10 students containing their name, address, Phone number and marks of five subjects. Now provide means for Searching a students data when Name or a id-no is input.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. Student/2
2. Marks/5 – four subject marks
3. Display all subject marks
4. Display All the student
5. Display all failure marks of a student

**Module 2:**

1. Fail or pass of subject1
2. Fail or pass of subject2
3. Fail or pass of subject3
4. Fail or pass of subject4
5. Display all pass marks of a student

**Module 3:**

1. Student pass or fail
2. Total marks of one student
3. Give id-no get the class
4. Give name get all marks
5. Display highest mark of a student
6. Display highest mark of a student

**Project 13 – Hotel Billing**

**Description:** This database contains the knowledge of food varieties available with their rates. Customers are open to select food items available and should pay the bill amount at the end.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are free to add some more facts which are missing to complete this project.**

**Module 1:**

1. tiffin/2
2. snacks/2
3. display all tiffins
4. display all snacks
5. Display all bakery items

**Module 2:**

1. food/1
2. order/3
3. rule for which is not food
4. display ordered items
5. Display items which are costlier

**Module 3:**

1. drinks/2
2. Display all drinks
3. Display all ordered drinks
4. Display all pass marks of a student
5. Display items which are cheaper.

**Goal : make bill for all the ordered items and display**

**Project 14 – recruiting students**

**Description:** Universities offers different branches in b.tech program, they are cse, ece, mech,eee,civil, bt etc. there are organizations offers placements for various branches. Some companies offers jobs for only one branch students. Some offers more than one branch and some offers for all. Some companies offers very few positions and some take in hundreds. Some companies offers more jobs for a particular branch and for other branches less. Considering all this knowledge prepare a prolog declarative facts and provide a information system.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. Branche/1
2. Company/3
3. Display all branches
4. Show when branch not exists
5. Display company recruited total of cse and ece
6. Display company recruited total of cse,eee and ece

**Module 2:**

1. Display company recruiting only cse
2. Display company recruiting only cse and others
3. Display company recruiting all branches
4. Display no of students recruited from any branch
5. Display total recruited students

**Module 3:**

1. Display all the companies
2. Display company not recruiting civil
3. Display company not recruiting civil and mechanical
4. Display company recruiting more than 50 students from cse
5. Display company and branch wise recruitment

**Project 15 – medical diagnosis**

**Description:** this database gives the details of the symptoms for atleast 6 diseases, and their diagnosis. The patient names and their symptoms are represented in the knowledge base . this system is able to predict the disease of the patient.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. patient/1
2. male/1
3. female/1
4. person/1
5. Display who is not a patient
6. Display all names with one common symptom

**Module 2:**

1. disease/1
2. Display all diseases
3. Display all female patient
4. Display all male patients
5. Display all names with more than one common symptom

**Module 3:**

1. Display symptoms of disease-1
2. Display symptoms of disease-2
3. Display symptoms of any patient
4. Display symptoms of all patients
5. Display the diagnosis report of a given patient

**Project 16 – journey plan**

**Description:** between every cities transport connectivity is available. Some cities have multiple modes of connectivity. Bus, train and plane modes of transportation are the different modes of transports. From these plane, bus and train are expensive, moderate and cheep modes respectively.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. bus/1
2. train/1
3. plane/1
4. Display all the busses
5. Display the cheep journey
6. Display the expensive journey

**Module 2:**

1. features/2
2. display features of all busses
3. Display features of any given bus
4. Display features of all
5. Display all possible journeys between two cities

**Module 3:**

1. travel/3 eg. travel(bus, from, to)
2. city/1
3. Display all bus routs
4. Display all modes from a city to other city
5. Display all plane routes

**Project 17 – real estate decisions**

**Description:** hoses are of two types. They are independent houses and flats. Again flats are three types from 3 BHK ,2 BHK and 1BHK. Rents depends on the type of house. For example a fully furnished 2bhk flat may be expensive than a 3bhk flat.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. flat/1
2. Display all flats
3. Decide whether it is a flat or not
4. Display which is not a flat
5. Display highest rented flat

**Module 2:**

1. threebhk/2
2. Display all 3BHK flats
3. Display highest rented 3BHK flat
4. Display lowest rented 3BHK flat
5. Display lowest rented flat

**Module 3:**

1. twobhk/2
2. Display all 2BHK flats
3. Display highest rented 2BHK flat
4. Display lowest rented 2BHK flat
5. Display the best flat

**Project 18 – electronic store**

**Description:** this electronic store sells mostly electronic items and few non electronic items. Electronic items are cameras, mobile phones and tvs. Many companies (brands) manufactures all items or some of the items. brands makes many types of tvs, cameras and mobile phones with different configurations and costs.

All modules work with translation of knowledge into prolog facts and prepare goals.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. electronics/1
2. camera/1
3. mobilephone/1
4. Display all mobile brands
5. Display the cheep tv

**Module 2:**

1. brand/2
2. make/2
3. Display all brands
4. Display products of any one brand
5. Display the cheep tv brand

**Module 3:**

1. cost/3
2. tv/1
3. Display all camera brands
4. Display all tv brands
5. Display non electronics brands
6. Display camera and tv with equal cost

**Project 19 – software companies**

**Description:** Wipro is large-sized company, located at Hyderabad, Chennai, Bangalore, Visakhapatnam. TCS is large-sized company, located at Hyderabad, Chennai, Trivandrum.  
CTS is mid-sized company, located at Chennai, Delhi , Mumbai, Kolkata.  
Panasonic is mid-sized company, located at Hyderabad, Delhi, Mumbai.  
Mid-Square is a small-sized company, located at Visakhapatnam, Kolkata, Trivandrum.  
Axis Software is a small-sized company, located at Hyderabad, Visakhapatnam, Vijayawada.  
  
Wipro, TCS pay low salary to their employees.  
CTS, Panasonic pay medium salary to their employees.  
Mid-Square, Axis Software pay high salary to their employees.  
  
Surya joins a company, if the company is located in Hyderabad and pays high salary.  
Chandrika joins a company , if the company is located in Andhra Pradesh.  
Mukesh joins a company, if the company pays medium or high salary to its employees.  
Meenakshi joins a company, if the company is small-sized.  
Sridhar joins a company, if the company is located at Chennai.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. Which are the companies which pay medium salary to their employees?

1. List the companies that are located at Hyderabad.  
   3. Which are the companies which Sridhar can join?
2. What are the locations of wipro?

**Module 2:**

1. Which are the companies which are located at Visakhapatnam and pay high salary?
2. Which are the companies that do not have offices at Hyderabad or Visakhapatnam?
3. Who are the people who are likely to join Wipro?
4. List all software companies

**Module 3:**

1. Who are the people who are likely to join TCS ?
2. List the companies located at Trivandrum.
3. List all companies that are small sized?
4. What is the best company to join, make a rule ?

**Project 20 – train travel**

**Description:**

Ratnachal Express is a superfast train.  
Konark Express is a superfast train.  
Intercity Express is a superfast train.  
Rajdhani Express is a superfast train.  
Simhadri Express is a fast-passenger.  
Waltair Express is a fast-passenger.  
  
Ratnachal Express halts at Eluru.  
Konark Express does not halt at Eluru.  
Intercity Express halts at Eluru.  
Rajdhani Express does not halt at Eluru.  
Simhadri and Waltair Expresses halt at Eluru.  
  
Rama boards a train at Eluru, if the train is superfast.  
Krishna boards a train at Eluru, if the train is fast-passenger.  
Siva boards a train at Eluru, any type of train.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. Which are the fast-passenger trains?
2. Which are the superfast trains?
3. Make a rule to find out the economic train?
4. Make a rule to luxury train?

**Module 2:**

1. What are the names of the trains which Rama can board at Eluru?
2. What are the names of the trains which Krishna can board?
3. Make a rule for the comfort train?
4. Make a rule list all fast passenger trains?

**Module 3:**

1. Which are the trains which halt at Eluru?
2. Which are the trains which do not halt at Eluru?
3. Which are the trains which Siva can board at Eluru?
4. Make a rule to compare train fares?

**Project 21– Rivers of India**

**Description:**Ganges river flows in the North region , and drains into Bangladesh.  
Chambal river flows in the North region , and drains into Bangladesh.  
Yamuna river flows in the North region , and drains into Bangladesh.  
Brahmaputra flows in the Northeast region and drains into Bangladesh.  
Subernarekha flows in the East-southeast region and drains into Bay of Bengal.  
Brahmani-Baitarani flows in the East-southeast region and drains into Bay of Bengal.  
Mahanadi flows in the Central-east region and drains into Bay of Bengal.  
Godavari flows in the Central region and drains into Bay of Bengal.  
Krishna flows in the Central region and drains into Bay of Bengal.  
Tapi flows in the Central-west region and drains into Arabian Sea.  
Narmada flows in the Central-west region and drains into Arabian Sea.  
Sabarmati flows in the North-west region and drains into Arabian Sea.  
  
Chambal merges into Yamuna in UttarPradesh.  
Yamuna merges into Ganges at Allahabad.  
Brahmaputra merges into Ganges at Bangladesh.  
  
**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. List the rivers which flow in the East-southeast region ?
2. Which are the rivers which drain into Bay of Bengal ?
3. List all the Rivers of south india?
4. Rivers that drain into Arabian sea?

**Module 2:**

1. In which region , Sabarmati river flows ?
2. Which of the rivers which merge into Ganges?
3. What are the rivers of Andhra Pradesh?
4. Put the rivers from north to south?

**Module 3:**

1. List the rivers which flow in the Central-west region ?
2. In which river, Chambal merges into, and at which place ?
3. What is the male river of india?
4. Find out the rivers passing through more than one state?

**Project 22– project on yogic chakras**

**Description :**

Swaadhistana chakra is located above Mulaadhara chakra.  
Manipura chakra is located above Swadhistana chakra.  
Anaahatha chakra is located above Manipura chakra.  
Vishuddha chakra is located above Anaahatha chakra.  
Aagna chakra is located above Vishuddha chakra.  
Sahashraara chakra is located above Aagna chakra.  
Ganapathi is the presiding deity for Mulaadhara chakra.  
Bramha is the presiding deity for Swaadhistaana chakra.  
Vishnu is the presiding deity for Manipura chakra.  
Rudra is the presiding deity for Anaahatha chakra.  
Jiva is the presiding deity for Vishuddha chakra.  
Hamsadevatha is the presiding deity for Aagna chakra.  
Guru devatha is the presiding deity for Sahashraara chakra.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. Which of the chakras are located above Mulaadhara chakra?
2. Which of the chakras are located below Anaahatha chakra?
3. Which of the chakraas are located between Swadhistaana and Aagnachakras ?
4. List all the chakras below Sahashraara chakra

**Module 2:**

1. Which of the chakras are located between Muladhaara and Sahashraarachakras ?
2. Who is the presiding deity for Sahashraara chakra?
3. Who are the presiding deities for chakras located above Anaahathachakra ?
4. List all the chakras below Aagna chakra

**Module 3:**

1. For which chakra is Vishnu the presiding deity?
2. Who are the presiding deities for chakras located between Mulaadhara and Vishuddhachakras?
3. Who are the presiding deities for chakras located below Aagna chakra?
4. List all the chakras below Vishuddha chakra

**Project 23 – Ben and Beverly**

**Description:** Ben has been working as a meat cutter for seven years. He earns a good salary and likes work, his coworkers, and his employer. He got the job just before his marriage to Beverly, and now they have three children. The youngest is two years old. Beverly recently resumed working as a bank teller. She and Ben had a serious discussion about their future. They concluded that Beverly is content in her banking career, but Ben wants more than the meat cutting in his future.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. Is Ben a male?
2. What is the relation between Ben and Beverly.
3. What is the profession of Ben?
4. Since how long Ben is working in his profession

**Module 2:**

1. Who is the husband of Beverly?
2. How many are the children of Ben and Beverly?
3. What is the age of the last kid?
4. What Beverly is currently doing?

**Module 3:**

1. Whom Ben is liking?
2. Since how long Beverly working in her job?
3. What is the Ben’s experience before his last kid has just born ?
4. Is Ben liking his job after seven years ?

**Project 24 – Tourist Advisor**

Description: different events are happening at different locations. The name of the program, place, when ie starting month, date and end date. These programs are of art, food, zoo etc of variety of types. Knowledge is available for food availability at venue, cost type of food, and distances between cities should be provided. Do atleast for 15 events.

Model fact:

registerEvent(Name, Place, Start-Month, Start-Date, End-Date, Classification, Genre)

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. registerEvent/7
2. rule, getDates/4 , get all dates with event name
3. rule, allYearEvent/1, list all events
4. rule, suitableForKids/1 , events for kids

**Module 2:**

1. foodAvailableAt/2
2. rule, getEvent /4
3. rule, partyEvents/4
4. rule, foodAvailable/2

**Module 3:**

1. distance /3
2. rule, near/2
3. rule, nearEvents(E,P)
4. display nearest events, depends on distance

**Project 25 – Speed Post**  
  
Indian Postal department charges some amount for dispatching parcels to distant places within India. The exact cost incurred is a function of the weight of the parcel, and the actual distance. The present tariff structure of the Speed Post, is given in the below table. Maximum weight of the Parcel, which can be sent by Speed Post is 35 Kg. Also, the distances from Vijayawada to different places is provided below.

**Note: You are permitted to add some more facts which are missing to complete this project.**

Distances from Vijayawada to various places

|  |  |
| --- | --- |
| Amaravathi | 40 KM |
| Bhadrachalam | 130 KM |
| Srisailam | 194 KM |
| Tirupathi | 347 KM |
| Srirangam | 764 KM |
| Sringeri | 985 KM |
| Varanasi | 1469 KM |
| Brindavan | 1647 KM |
| Haridwar | 1968 KM |
| Dehradun | 2003 KM |
| Badrinath | 2231 KM |
| Gangotri | 2254 KM |

**Current tariff structure of Speed Post**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Weight** | **Local** | **Upto 200 Kms.** | **201 to 1000 Kms.** | **1001 to 2000 Kms.** | **Above 2000 Kms.** |
| Upto 50 grams | INR  15 | INR  35 | INR  35 | INR  35 | INR  35 |
| 51 grams to 200 grams | INR  25 | INR  35 | INR  40 | INR  60 | INR  70 |
| 201 grams to 500 grams | INR  30 | INR  50 | INR  60 | INR  80 | INR  90 |
| Additional 500 grams or part thereof | INR  10 | INR  15 | INR  30 | INR  40 | INR  50 |

Write a Prolog program to represent this knowledge, in the form of facts. Subsequently, write the queries in Prolog to answer the following questions:-

**Module 1:**

1. What is the tariff for sending 40 grams parcel from Vijayawada to Badrinath ?
2. What is the cost associated with sending a 1 kg parcel from Vijayawada to Tirupathi ?
3. If it costs Rs 95/- to send a parcel, from Vijayawada to Srisailam, what could be the possible weight of the parcel ?
4. If it costs Rs 120/- to send a parcel, from Vijayawada to Srirangam, what could be the possible weight of the parcel ?
5. What is the cost of sending 2 parcels from Vijayawada to Haridwar , the first one weighing 5 kg, and the second one weighing 7 kg ?

**Module 2:**

1. What are the postal charges associated with sending 1 parcel of 250 g from Vijayawada to Sringeri, and another parcel of 550 g from Vijayawada to Bhadrachalam ?
2. What is the postal tariff for sending a 10 kg parcel from Vijayawada to Varanasi ?
3. What is the postal tariff for sending 3 parcels from Vijayawada to Brindavan,   
   first one weighing 2 kg, second one weighing 4 kg, and third one weighing 6 kg ?
4. What is the cost associated with sending 5 parcels from one place in Vijayawada to another place in Vijayawada, each parcel weighing double than the previous one ? Assume that the weight of the first parcel is 50g.
5. What is the postal tariff for sending a parcel weighing 35 kg, from Vijayawada to Gangotri ?

**Module 3:**

1. If a person cannot afford to pay more than Rs 1,000/- to the postal department,   
   for sending a parcel to Dehradun from Vijayawada, what should be the maximum expected size of the parcel ?
2. For sending a parcel weighing below 50 g, to the farthest place (in the given list of places)   
   from Vijayawada , what is the postal tariff associated ?
3. Which are the places to which a parcel weighing 400 g can be dispatched, given a budget limitation of Rs 60/- ?
4. Which are the places to which a parcel weighing 1 kg can be dispatched, given a budget limitation of Rs 120/- ?
5. Which are the places to which 2 parcels weighing 40 g and 100 g, can be dispatched, given a budget limitation of Rs 105/- ?
6. What are the different ways of dispatching 4 books , each weighing 10 kg, by speed post, from Vijayawada to Brindavan ? Which method costs less ?

**Project 26 – Expert System On Medicinal Plants**

Description: List of important medicinal plants and their uses: (Knowledge Base)

Amla is a tree. It matures after 4 years. It’s family name is Euphorbiaceac. The part of this tree which is used as medicine , is Fruit. Average Price is Rs 45/- per kg. It is used for curing “ Lack of Vitamic-C,   
Cough, Diabetes, Cold, Hyper Acidity”.  
  
Ashok is a tree. It matures after 10 years. It’s family name is Caesalpinanceac. The part of this tree which is used as medicine, is Bark Flower. Average Price is Rs 125/- per kg. It is used for curing Menstrual Pain, Uterine disorder, Diabetes.

Aswagandha is a herb. It matures after 1 year. It’s family name is Solanaccac. The part of this tree which is used as medicine, is Root, Leafs. Average Price is Rs 140/- per kg. It is used for curing Stress, Nerves disorder, Aphrodiasiac.

Bilva is a tree. It matures after 5 years. It’s family name is Rutaccac. The part of this tree which is used as medicine is Fruit, Bark. Average Price of Fruit is Rs 125/- per kg, Pulp is Rs 60/- per kg. It is used for curing Diarrhea, Dysentery, Constipation.

Brahmi is a herb. It matures after 1 year. Family name is Scrophulariaccac. The part of this tree which is used as medicine is Whole Plant. Average Price is Rs 20/- per kg. It is used for curing Nervousness, Loss of memory, Mental disorder.

Kalmegh is a herb. Family name is Scanthaccac. The part of this tree which is used as medicine is Whole Plant. Average Price is Rs 20/- per kg. It is used for curing Fever, Weakness, Stomach Ache.

Madhunasini is a climber. Family name is Asclepiadaccac. The part of this tree which is used as medicine is Leaves. Average Price is Rs 75/- per kg. It is used for curing Diabetes, Hydrocil, Asthama.

Guluchi is a climber. It matures after 1 year. Family name is ?. The part of this tree which is used as medicine is Stem. Average price is Rs 25/- per kg. It is used for curing Gout, Pile, General Debility, Fever, Jaundice.

Pippali is a climber. It matures after 3 years. Family name is Piperaccac. The part of this tree which is used as medicine is Fruit, Root. Average price is Rs 150/- per kg. It is used for curing Loss of Appetite, Enlarged Spleen, Bronchitis , Cold.

Sandalwood is a tree. It matures after 30 years. Family name is Santalinaccac. The part of this tree which is used as medicine is Heartwood, Oil. Average price is Rs 350/- per kg. It is used for curing   
Skin Disorder, Burning sensation, Jaundice, Cough.

Tulsi is a tree. It matures after 3 months. Family name is Lamiaccac. The part of this tree which is used as medicine is Leaves, Seed. Average price is Rs 10/- per kg. It is used for curing Cough, Cold, Bronchitis.

Write a Prolog program to represent the knowledge shown as a list of medicinal plants, in the form of Prolog facts. Subsequently, answer the above queries, using Prolog language.

**Note: You are permitted to add some more facts which are missing to complete this project.**

**Module 1:**

1. Which are the plants used for curing Cough and Cold ?
2. List out all the herbs along with their maturity period.
3. Which medicinal plant is available for the lowest price, out of all the available plants?
4. Which plant is used for curing Nervous disorder, with the part of the tree being ‘Whole Plant’?
5. Which medicinal plant has the longest maturity period, out of all the available plants?
6. List out all the climbers along with the common disorder which is cured by each of them.

**Module 2:**

1. Which is the plant for which it’s seed has a medicinal value? Also, list its maturity period.
2. Which part of Bilva tree is used as medicine? Also, list the diseases which it cures.
3. List out the plants whose fruit is used as medicine.
4. List out the plants whose bark is used as medicine.
5. What are the plants which are used to cure fever? Mention their types also ( Tree or Herb or Climber )

**Module 3:**

1. A person is suffering from Dysentery and Bronchitis. Which plant can cure him from these ills?
2. List the plants, along with their family names whose leaves offer medicinal value.
3. List out all the plants, along with their types, whose maturity period is exactly one year.
4. A person orders 2 kg of Bilva fruit and 1 kg of Bilva pulp. What are the diseases he is suffering from? Also, what is the total cost he incurs ?
5. Which plants are used to cure Diabetes? Mention the types, and also the parts used .