TODO!

Sunday, 26 March 2023 1:58 pm

- [ ] Expert System About Currency Trading or FOREX
- [ ] Differential GPS

Readings

- [ ] For final exams.

Knowledge-based Programming

Friday, 24 February 2023 8:34 am

Introduction to Prolog

Wednesday, 22 February 2023 7:00 pm

References: Programming in Prolog

- Prolog provides a uniform data structure, called *term*, from which all data, as well as Prolog program, are constructed.

  Basic construct of Prolog:
  - Facts
  - Questions
  - Variables
  - Conjunctions
  - Rules

  Other features:
  - Lists
  - Recursion

- Prolog program consists of a set of clauses that either fact or rule.

- Computer programming in Prolog consist of:

  - specifying some *facts* about **objects** and their **relationship**.
  - defining some *rules* about **objects** and their **relationships**, and
  - asking *questions* about **objects** and their **relationships**.

- *"Prolog is a storehouse of facts and rules and uses it to answer questions".*

- In usual way, Prolog is used in an ***interactive*** way such as conversation.

Fundamentals

1. FACTS

Ex:
likes(john, mary). } Facts

relationship objects

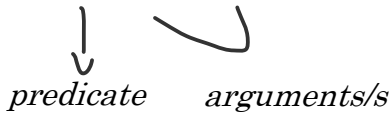
Express as "John likes Mary"

Notes:

- The order of the object/s written around the brackets is/are arbitrary, the programmer should decide the order and be consistent about it.
- Not individual names are called "non-count word" (e.g., gold and valuable) by logicians.
- Objects enclosed around the brackets are called ***arguments***.
- A collection of facts is called ***database***.

TERMINOLOGY:

likes(john, mary).



2. QUESTIONS

Question format in Prolog:

?- owns(mary, book).

Unify is when we ask question in Prolog system, search the database, and matches the predicate and objects, Prolog will response ***yes***, else responses ***no***.

3. VARIABLES

the variable X is initially not instantiated.
";" + "Enter" -> is to tell the Prolog system to research again
then if nothing left, the Prolog system will response "***no***"

4. CONJUNCTIONS

if we want to ask this question to Prolog "Does John likes Mary? And Does Mary likes John?". The *and* conjunction is represent as ',' comma in Prolog;

- ?- likes(john, mary), likes(mary, john).

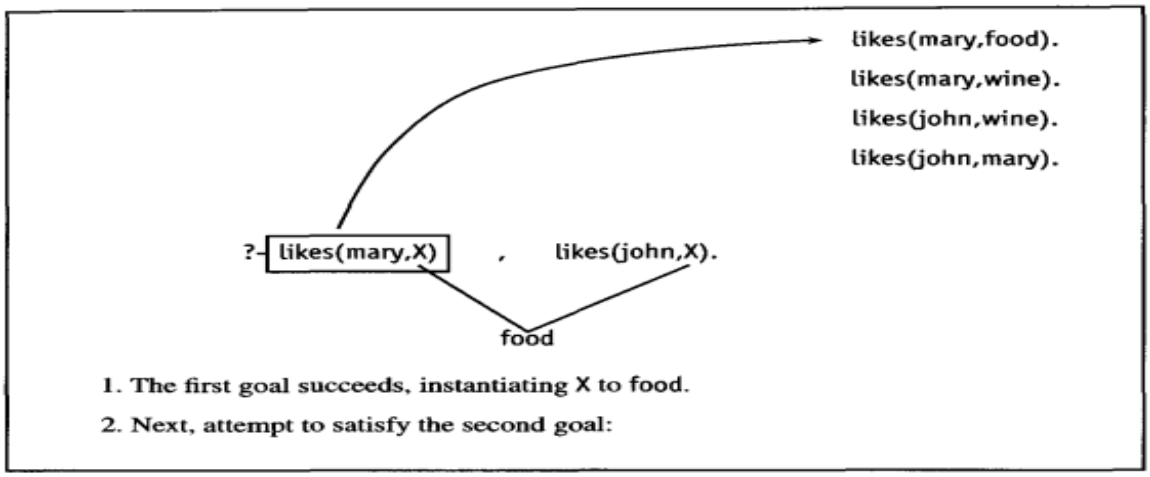
Given database:

```
likes(mary, chocolate).
likes(mary, wine).
likes(john, wine).
likes(john, mary).
```

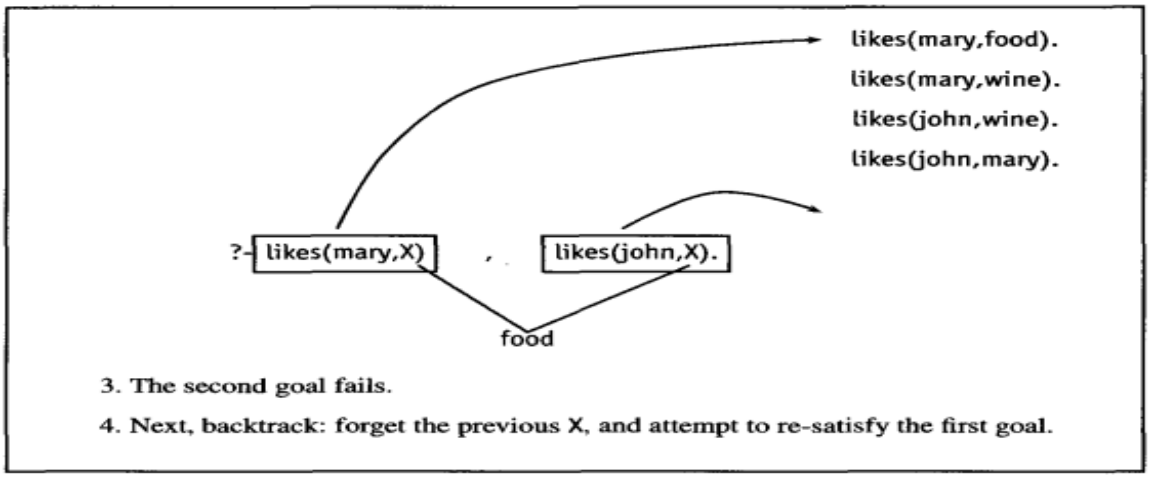
- ?- likes(mary, X), likes(john, X).

- **BACKTRACKING** is when Prolog repeatedly attempts to satisfy and re-satisfy goals in a conjunction.

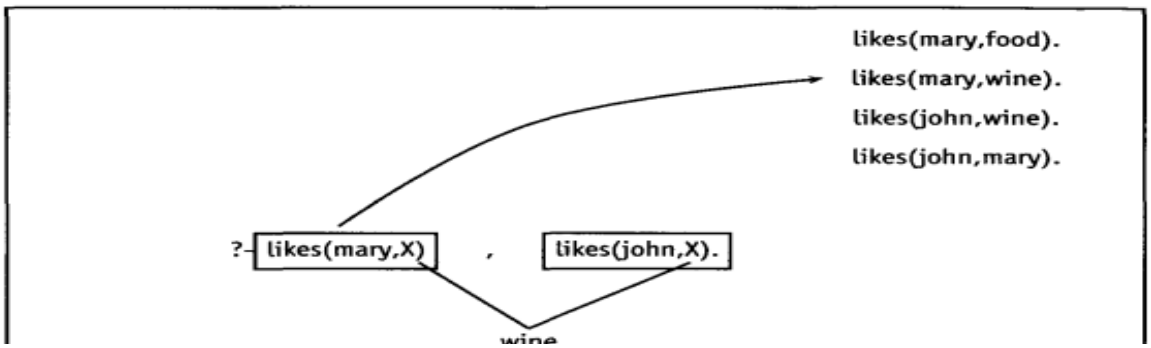
Pencil-and-paper Aid for tracking:

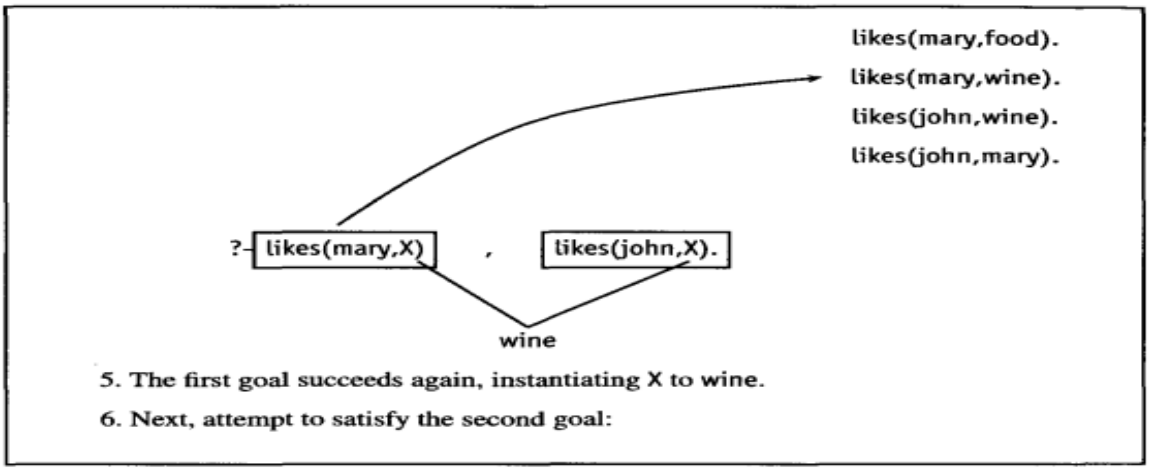


1. The first goal succeeds, instantiating X to food.
2. Next, attempt to satisfy the second goal:

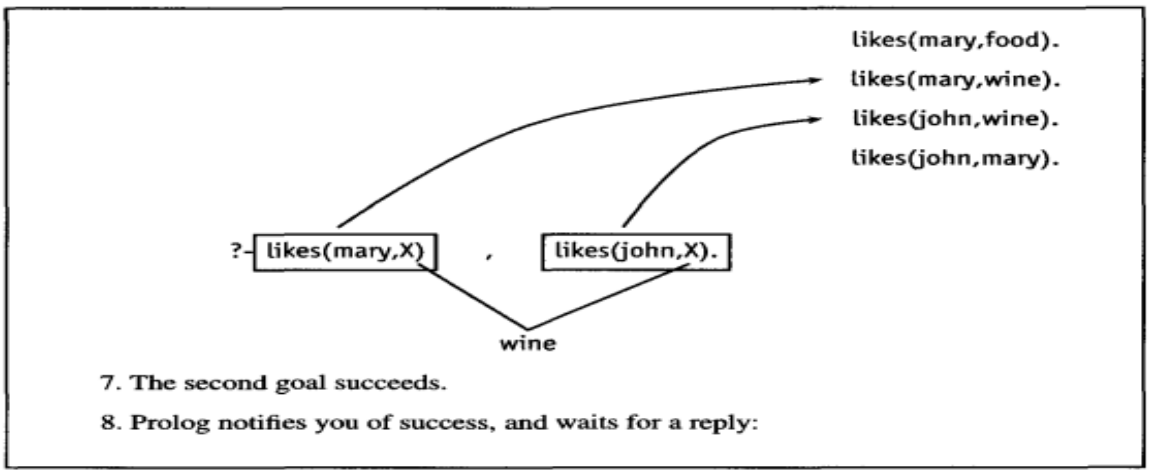


3. The second goal fails.
4. Next, backtrack: forget the previous X, and attempt to re-satisfy the first goal.





5. The first goal succeeds again, instantiating X to wine.
6. Next, attempt to satisfy the second goal:



7. The second goal succeeds.
8. Prolog notifies you of success, and waits for a reply:

X = wine

5. RULES

- In Prolog, a rule consists of a *head* and a *body.*
- Head and body is connected by "**:-**" (pronounced *if)*

Example:
likes(john, X) :- likes(X, wines).

- Rules also end with dot (.)
- The head of the rule is the fact that intended to define.
- The body describes the goals that must be satisfied.

Example of Rule:

```
male(albert).
male(edward).

female(alice).
female(victoria).

parents(edward, victoria, albert).
parents(alice, victoria, albert).
```

Rule for sister_of:

```
sister_of(X, Y) :-
    female(X),
    parents(X, M, F),
    parents(Y, M, F).
```

Then let us the question:

```
?- sister_of(alice, edward).
```

When asked this question given the above database and rule for sister_of, Prolog proceeds as follows:

1. First, the question unifies with the head of the only sister_of rule above, so X in the rule becomes instantiated to alice, and Y becomes instantiated to edward. The place marker for the question is put against this rule. Now Prolog attempts to satisfy the three goals in the body, one by one.
2. The first goal is female(alice) because X was instantiated to alice in the previous step. This goal is true from the list of facts, so the goal succeeds. As it succeeds, Prolog marks the goal's place in the database (the third entry in the database). No new variables were instantiated, so no other note is made. Prolog now attempts to satisfy the next goal.
3. Now Prolog searches for parents(alice, M, F), where M and F will unify with any arguments because they are uninstantiated. A unifying fact is parents(alice, victoria, albert), so the goal succeeds. Prolog marks the place in the database (sixth down from the top) and records that M became instantiated to victoria, and F to albert. (You may write these under the goal in the rule if you want to keep track of them on paper). Prolog now attempts to satisfy the next goal.
4. Now Prolog searches for parents(edward, victoria, albert) because Y is known as edward from the question, and M and F were known to stand for victoria and albert from the previous goal. The goal succeeds, because a unifying fact is found (fifth down from the top). Since it is the last goal in the conjunction, the entire goal succeeds, and the fact sister_of(alice, edward) is established as true. Prolog answers ***yes***.

Nani Search

Monday, 27 February 2023 1:17 pm

Expert System often called **rule-based systems.**

Second Meeting

Tuesday, 28 February 2023 9:15 am

Second Meeting

Audio recording started: 9:28 am Tuesday, 28 February 2023

Types of inference engine for Expert System.

A. Backward Chaining
B. Forward Chaining
   ~ Production system
   ~ bottom-up approach
   ~ Making decision/conclusion based on known facts
   ~ data driven

Example:

Kb	*state
R1: if A and C then F R2: if A and E then a R3: if B then E R4: if a then D	A B E

If we want to prove that if A and B are true, then D is true

Expert System

Wednesday, 26 April 2023 10:15 am

Strategy:

1. Identify close candle sticks that are located between 10 and 20 simple moving averages.
    a. Let's call this area between the 10 and 20 moving averages "The Zone".
2. Identify close candle sticks that are located above 10 and 20 simple moving averages.
    a. Let's call this area above the 10 and 20 moving averages "Above The Zone".
3. Identify close candle sticks that are located below 10 and 20 simple moving averages.
    a. Let's call this area above the 10 and 20 moving averages "Below The Zone".
4. Use the order of the 10, 20 and 50 simple moving averages to determine the trend.
    a. If the 10 and 20 are above the 50 moving averages, it is consider **bullish**.
    b. If the 10 and 20 moving averages are below 50 moving average, it is consider **bearish.**
    c. If the 50 moving average is less than 10 and 20 moving average, and 20 is greater than 10 moving average, and Close is less than or equal to Open; or if 50 moving average is between 10 and 20 moving averages and 20 is greater than 10 moving average, then it is consider **going bearish.**
    d. If the 50 moving average is greater than 10 and 20 moving average, and 10 is greater than 20 moving averages and Close is greater than or equal to Open; or if 50 is between 10 and 20 moving averages and 10 is greater than 20 moving average, then it is consider **going bullish.**
5. If the candlestick green is **"Above The Zone"** or **"The Zone"**, and the trend is **bullish**:
    a. then take a going high or buy order.
6. If the candlestick red is **"Above the Zone"** or **"The Zone"**, and the trend is **bullish:**
    a. then take a going high or buy order.
7. If the candlestick red or green is **"Below The Zone"**, and the trend is **bullish**:
    a. then take hold of your position or if no position then don't order.
8. If the candlestick red is **"Below The Zone"** or **"The Zone"**, and the trend is **bearish:**
    a. then take going low or sell order.
9. If the candlestick green is **"Below The Zone"** or **"The Zone"**, and the trend is **bearish:**
    a. then take going low or sell order.
10. If the candlestick red or green is **"Above The Zone"**, and the trend is **bearish**:
    a. then take hold of your position or if no position then don't order.
11. If the candlestick green is **"Above The Zone" or "The Zone" or "Below The Zone"**, and the trend is **going bullish:**
    a. then take going high or buy order.
12. If the candlestick red is **"Above The Zone" or "The Zone" or "Below The Zone"**, and the trend is **going bearish:**
    a. then take going low or sell order.
13. If close value is equal to open value:
    a. then take hold of your position or if no position then don't order.
14. If trend or/and the zone of the candlestick is not clear:
    a. then take hold of your position or if no position then don't order.

Chart Pattern:

- Double/Multiple Tops and Bottoms
- Ascending/Descending Triangles
- Symmetrical Triangles
- Wedges

Technical Analysis/Indicators

- Simple Moving Averages
- Moving Average Crossovers
- Bolling Bands

- Relative Strength Index (RSI)
    - Oversold and Overbought
- Fibonacci
    - Fibonacci Retracement

Expert System:
Strategies:

- Highlight bullish candle stick in the buy zone.
- Highlight bearish candle stick in the sell zone.

Alhamdulillah!
Make a report (Printed copy):

- Strategy
- How the strategies are implemented.
- Flowchart/Algorithm of the strategy.

Whole code will be pass through soft copy.

Reinforcement Learning

Sunday, 26 March 2023 1:46 pm

3rd Meeting

Tuesday, 21 March 2023 9:14 am

What is Scalping?

3rd Meeting

Audio recording started: 9:25 am Tuesday, 21 March 2023

Reinforcement Learning

Can be traced back to:
- Classical Conditioning - Pavlor (1897)

Download:
- Reinforcement Learning by Barto & Sutton

Q-Learning
Markov Decision Process (MDP)

What is Epsilon Greedy; Exploitation

Artificial Neural Network

Tuesday, 4 April 2023 4:06 pm

4th Meeting

Tuesday, 28 March 2023 9:18 am

Artificial
Neural Ne...

Audio recording started: 9:19 am Tuesday, 28 March 2023

PERCEPTRON

Backpropagation Algorithm

Project for Neural Network

Tuesday, 11 April 2023 9:16 am

Audio Recording

Audio recording started: 9:16 am Tuesday, 11 April 2023

Differential GPS

Real-time Adaptive Neural Network

Introduction to Artificial Neural Network by Haykin

Average if cloudy situation +/-40 ft error.

Most accurate is naa sa +/-5 meters or almost +-20 ft

In military version of GPS accuracy is around +/-3cm
- In the design of the receiver, they uses multiple frequency

Problems that causes distortion in GPS signal
- Cloud cover
- Satellite Geometry (Placement) in USA +/- 300 Satellites
- Occlusion from building
- Temperature Variation
- The design the receiver (Low quality)

Ang setup ana is naa kay reference point (this can be a very expensive device). In the reference point area, mag patong ka ug ordinary na GPS receiver (Then ma compare ang difference sa reference point na accurate ug sa gipatong na ordinary gps receiver then you can get the correction factor out of it).

So katong mga subscriber the duol ana na area pwede sila maka kuha sa correction factor. Katong mga ginagamit sa mga subscriber na ordinary na gps receiver, naa silay ipa run sa software then ma correct siya automatically, then ang ilahang accuracy is same na sa katong reference point na accuracy.

Unsaon pag implement using Neural Network
We can put an ordinary GPS receiver on the top of reference point and then we can run a real time adaptive neural network that will learn continuously and predicting for the correction factor.

The project will be based or graded based on the accuracy of the project.

(Start of the discussion of the representation of the network 14:00).

The reason why using a real-time adaptive neural network

- The neural network will learn the dynamics of the error all the time.
- The width of this time history is very important (it should be longer or wider)
- As 'k' increases, the accuracy will improve, but the problem is as 'k' increases, the computational requirement also increases.
- Correction Factor ang i-transmit
- Pag Backpropagate dapat i-define and error (maybe mean squared error ang gamiton)

Self-Organizing Maps: Fundamentals

Tuesday, 18 April 2023 10:15 am

Self Organizin...

Audio recording started: 10:16 am Tuesday, 18 April 2023

Reporting:

Present a case study:

- The problem trying to solve
- Gi unsa pag apply
- Unsa iyang mga settings
- Gi unsa pag implement

DGPS-ANN

Thursday, 6 July 2023 1:06 pm

Genetic Algorithm

Tuesday, 9 May 2023 2:46 PM