

Lecture three:***Conjunctions and backtracking*****1. Conjunctions**

1. and ‘,’.
2. or ‘;’.

Used to combine facts in the rule , or to combine fact in the goal to answer questions about more complicated relationship.

Example:

Facts

Like (mary,food).

Like(mary,wine).

Like(john,mary).

Goal

Like(mary,john),like(john,mary).

We can ask does mary like john and does john like mary?

Now, how would prolog answer this complicated question?

Prolog answers the question by attempting to satisfy the first the first goal. if the first goal is in the database, then prolog will mark the place in the database, and attempt to satisfy the second goal.

If the second goal is satisfied, then prolog marks that goal's place in the database, and we have a solution that satisfy both goals.

♦ It is important to remember that each goal keeps its own place marker. If, however, the second goals are not satisfied, then prolog will attempt to re-satisfy the previous goal.

Prolog searches the database in case it has to re-satisfy the goal at a later time. But when a goal needs to be re-satisfied, prolog will begin the search the search database completely for each goal. If a fact in the database happens to match , satisfying the goal, then prolog will mark the place in the database in case it has to re-satisfy the goal at the later time. But when a goal needs to be re-satisfied, prolog will begin the search from the goal's own place marker, rather than from the start of database and this behavior called "backtracking".

Example: about backtracking

*Facts

Like(mary,food).

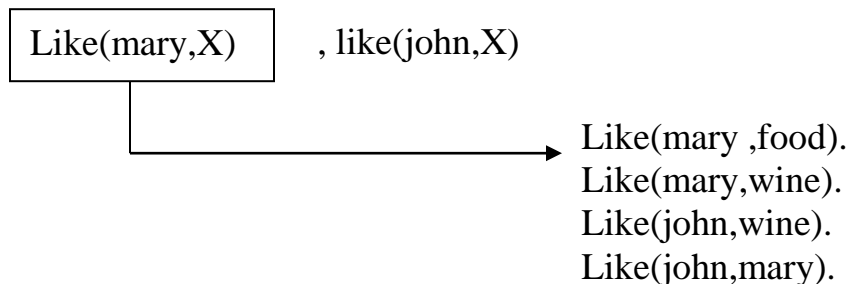
Like(mary,wine).

Like(john,wine).

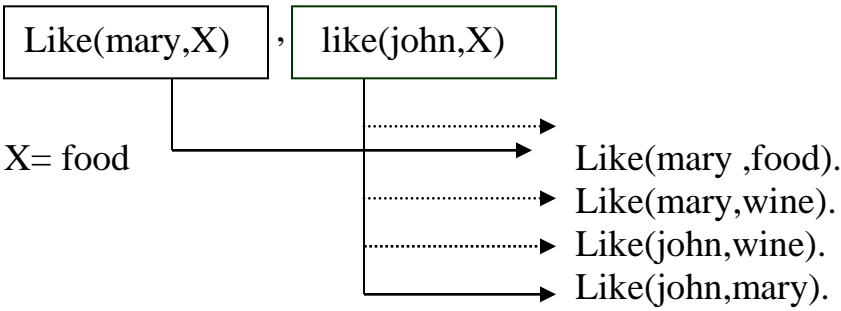
Like(john,mary).

*Goal:

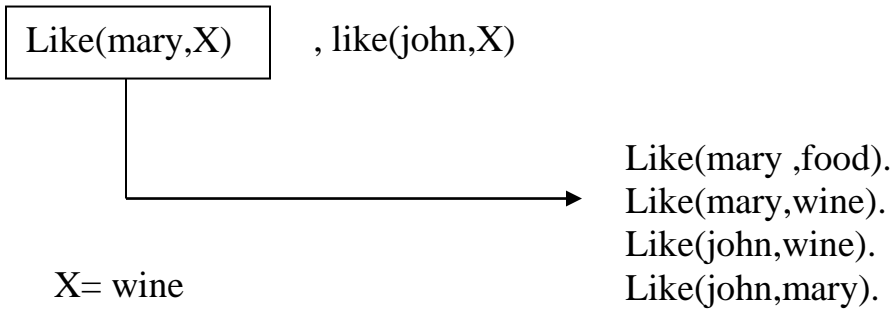
Like(mary,X),like(john,X).



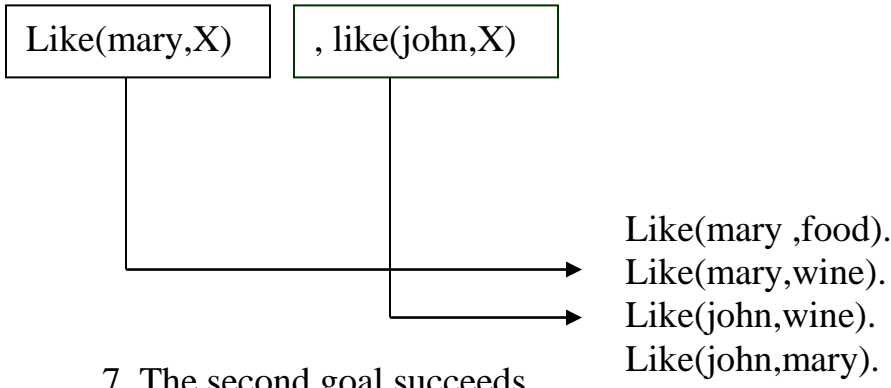
1. The first goal succeed, bound X to food.
2. Next, attempt to satisfy the second goal.



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



- 5. The first goal succed agin, bund X to wine.
- 6. Next, attempt to satisfy the second goal.



- 7. The second goal succeeds.
- 8. Prolog notifies you of success.

H.W
Trace the following goal to find the value of X,Y,W,Z.
Fact
Mark(a,10).
Mark(b,20).