

### Rule :

A **rule** can be viewed as an extension of a fact with added conditions that also have to be satisfied for it to be true. It consists of two parts. The first part is similar to a fact (a predicate with arguments). The second part consists of other clauses (facts or rules which are separated by commas) which must all be true for the rule itself to be true. These two parts are separated by ":-". You may interpret this operator as "if" in English.

**parent(X, Y) :- father(X,Y).**

**parent(X, Y) :- mother(X, Y).**

Example: 01

sells(mila,egg).

sells(joni,apple).

sells(john,bread).

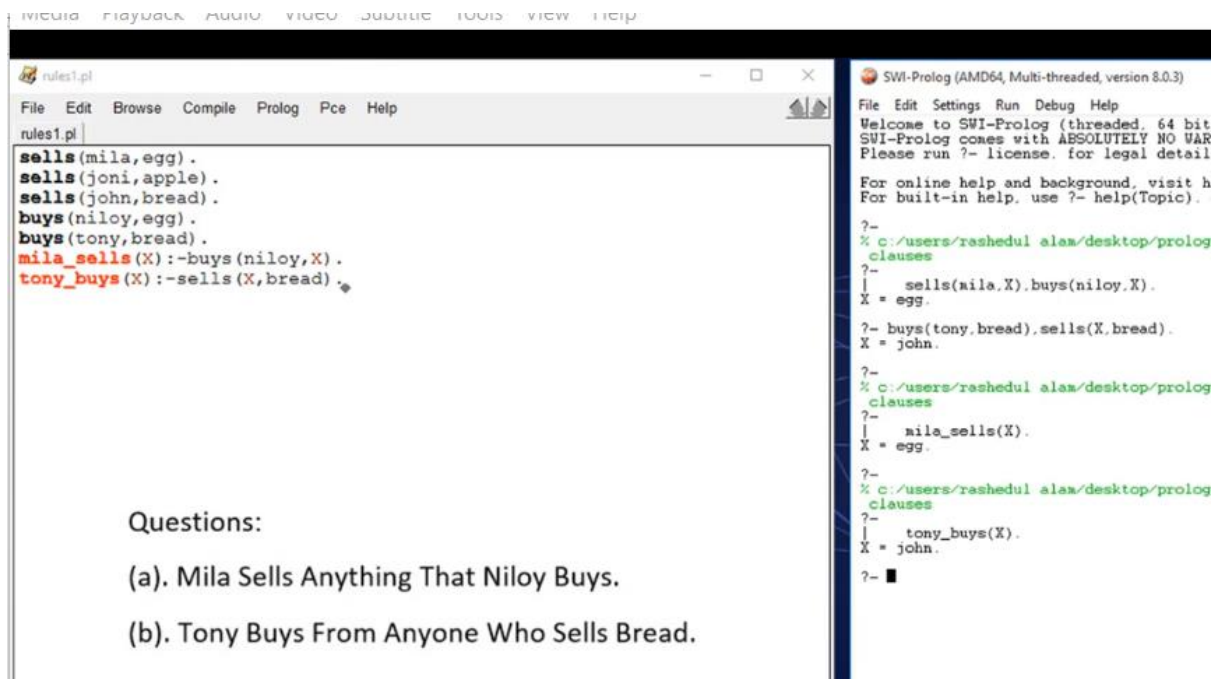
buys(niloy,egg).

buys(tony,bread)

Questions:

(a). Mila Sells Anything That Niloy Buys.

(b). Tony Buys From Anyone Who Sells Bread.



The screenshot shows a Prolog IDE window titled 'rules1.pl'. The editor contains the following code:

```
sells(mila,egg).
sells(joni,apple).
sells(john,bread).
buys(niloy,egg).
buys(tony,bread).
mila_sells(X):-buys(niloy,X).
tony_buys(X):-sells(X,bread).
```

Below the editor, the 'Questions:' section is repeated:

Questions:

(a). Mila Sells Anything That Niloy Buys.

(b). Tony Buys From Anyone Who Sells Bread.

On the right, the SWI-Prolog console shows the following output:

```
SWI-Prolog (AMD64, Multi-threaded, version 8.0.3)
File Edit Settings Run Debug Help
Welcome to SWI-Prolog (threaded, 64 bit)
SWI-Prolog comes with ABSOLUTELY NO WARRANTY
Please run ?- license. for legal detail

For online help and background, visit h
For built-in help, use ?- help(Topic).

?-
% c:/users/rashedul alam/desktop/prolog
clauses
?-
| sells(mila,X),buys(niloy,X).
X = egg.
?- buys(tony,bread),sells(X,bread).
X = john.

?-
% c:/users/rashedul alam/desktop/prolog
clauses
?-
| mila_sells(X).
X = egg.

?-
% c:/users/rashedul alam/desktop/prolog
clauses
?-
| tony_buys(X).
X = john.
?-
```



Facts:

```
father(shohidul,satcho).  
father(jamal,shohidul).  
father(rahman,jamal).  
father(someone,rahman).
```

Questions:

- (a). Is Jamal grandfather of Satcho?
- (b). What is the name of Sathco's grandfather?

End



Activate Windows

```
rules 3.pl  
File Edit Browse Compile Prolog Pce Help  
rules 3.pl  
father(shohidul,satcho).  
father(jamal,shohidul).  
father(rahman,jamal).  
father(someone,rahman).  
% grandfather(jamal,satcho):-father(jamal,shohidul),(shohidul,satcho).  
grandfather(X,Y):-father(X,shohidul),father(shohidul,Y).  
▲
```

```
SWI-Prolog (AMD64, Multi-threaded, version 8.0.3)  
File Edit Settings Run Debug Help  
Welcome to SWI-Prolog (threaded, 64 bits, version 8.0.3)  
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free s  
Please run ?- license. for legal details.  
  
For online help and background, visit http://www.swi-prolog.  
For built-in help, use ?- help(Topic). or ?- apropos(Word).  
  
?-  
% c:/users/rashedul alam/desktop/prolog codes/rules 3 compil  
0 clauses  
?-  
| grandfather(jamal,satcho).  
ERROR: Undefined procedure: shohidul/0  
ERROR: In:  
ERROR: [9] shohidul  
ERROR: [8] grandfather(jamal,satcho) at c:/users/rashedul  
/prolog codes/rules 3.pl:5  
ERROR: [7] <user>  
Exception: (9) shohidul ?  
% c:/users/rashedul alam/desktop/prolog codes/rules 3 compil  
-1 clauses  
creep  
Exception: (8) grandfather(jamal, satcho) ? creep  
?- grandfather(jamal,satcho)  
ERROR: Undefined procedure: shohidul/0  
ERROR: In:  
ERROR: [9] shohidul  
ERROR: [8] grandfather(jamal,satcho) at c:/users/rashedul  
/prolog codes/rules 3.pl:6  
ERROR: [7] <user>  
Exception: (9) shohidul ?  
% c:/users/rashedul alam/desktop/prolog codes/rules 3 compil  
0 clauses  
randfather(jamal,satcho).goals  
[9] shohidul  
[8] grandfather(jamal, satcho)  
Exception: (9) shohidul ? creep  
?- grandfather(jamal,satcho).  
true.  
?- grandfather(X,Y).  
X = jamal  
Y = satcho.  
I  
?-  
?-
```

Activate Windows

Structure:

# Nested Structure in Prolog

```
has(joe, car(ford,3,5000)).  
has(joe, car(opel,2,6000)).  
has(mick, car(toyota,5,1000)).  
has(mick, car(ford,2,2000)).
```

## What kind of Ford does Mick have?

```
has(joe, car(ford,3,5000)).  
has(joe, car(opel,2,6000)).  
has(mick, car(toyota,5,1000)).  
has(mick, car(ford,2,2000)).
```

Query: `has(mick, car(ford, Age, Price))`

Answer: Age=2, Price=2000

## Q: Show the Car Name and Price info (Condition: Price is less than 5000)

```
has(joe, car(ford,3,5000)).  
has(joe, car(opel,2,6000)).  
has(mick, car(toyota,5,1000)).  
has(mick, car(ford,2,2000)).
```

```
| ?- has(_, car(Car,_Price)), Price < 5000.
```

Outputs:

```
Car = toyota  
Price = 1000 ? ;
```

```
Car = ford  
Price = 2000 yes
```

Yes.

```
File Edit Browse Compile Run Help  
str2.pl  
likes(fuad,  
      movie(endgame,  
            actor(chris,evans))) .
```

For built-in help, use ?- help(Topic). or ?- apropos(Word).

```
?-  
% c:/users/rashedul alam/desktop/prolog codes/str2 compiled  
lauses
```

```
?-  
| likes(fuad,movie(endgame,actor(FirstName,LastName))).  
FirstName = chris,  
LastName = evans.
```

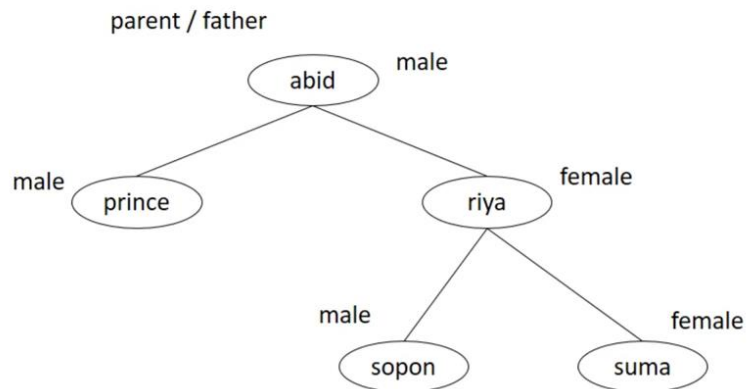
```
?- likes(fuad,movie(MOVIE,actor(chris,evans))).  
MOVIE = endgame.
```

```
?-  
I
```

```

male(abid).
male(prince).
male(sopon).
female(riya).
female(suma).
parents(abid,prince).
parents(abid,riya).
parents(riya,sopon).
parents(riya,suma).
father(X,Y) :- parents(X,Y) , male(X).
mother(X,Y) :- parents(X,Y) , female(X).

```



3.Rule and listing in prolog prolog programming tutorial in Bangla prolog lecture in Bangla - 3..mp4 - VLC media player

Media Playback Audio Video Subtitle Tools View Help

SWI-Prolog (AMD64, Multi-threaded, version 7.2.3)

File Edit Settings Run Debug Help

**false.**

6 ?- listing(male).  
male(abid).  
male(prince).  
male(sopon).

**true.**

7 ?- listing(female).  
female(riya).  
female(suma).

**true.**

8 ?- listing(parents).  
parents(abid, prince).  
parents(abid, riya).  
parents(riya, sopon).  
parents(riya, suma).

**true.**

prolog2 - Notepad

File Edit Format View Help

```

male(abid).
male(prince).
male(sopon).
female(riya).
female(suma).

parents(abid,prince).
parents(abid,riya).
parents(riya,sopon).
parents(riya,suma).

father(X,Y):- parents(X,Y),male(X).
mother(X,Y):- parents(X,Y),female(X).

```

## Operations:

For help, use ?- help(Topic). or ?- apropos(Word).

1 ?- X is 5+7.

X = 12.

2 ?- X is 5-2.

X = 3.

3 ?- A is 5\*3.

A = 15.

4 ?- B is 10/2.

B = 5.

5 ?- X is 2^4.

X = 16.     I

6 ?- |

1 ?- X is max(7,12).

X = 12.

2 ?- A is min(7,12).

A = 7.