1

Premises

1. Horses, cows, pigs are mammals.

2. An offspring of a horse is a horse.

3. Bluebeard is a horse.

4. Bluebeard is Charlie's parent.

5. Offspring and parent are inverse relations.

6. Every mammal has a parent.

Question

Is Charlie a horse?

```prolog
PREDICATES
  horse (STRING) mammal(STRING) cow (STRING)
  pig (STRING)
  is_offspring (STRING, STRING) is_parent (STRING, STRING)
  CLAUSES
  mammal(X):
horse (X) ,
  cow (X) ,
  pig (X) ,
  is_parent (_, X).
  horse (Y):
is_parent (X, Y), horse (X) . horse ("Bluebeard") .
  is_offspring (X, Y):
is_parent (Y, X) .
  is_parent ("Bluebeard","Charlie") .
cow (" ?") .
  pig (" ?") .
  GOAL
  horse ("Charlie ").
```

Listing 1: Prolog Code for Solution Finding

Output

no

2

Premises

1. All people who are not poor and are smart are happy.

2. Those people who read are not stupid.

3. John can read and is wealthy.

4. Happy people have exciting lives.

Question

Can anyone be found with an exciting life?

```prolog
PREDICATES
  pompeian ( symbol )
  nondeterm roman ( symbol )
  nondeterm loyal ( symbol , symbol )
nondeterm hate ( symbol , symbol )
```

```
6    nondeterm assassinate ( symbol , symbol )
7   nondeterm not_loyal ( symbol , symbol )
8    CLAUSES
9    roman (X):-
10  pompeian (X) .
11   assassinate ( marcus , caesar ) .
12  pompeian ( marcus ) .
13   hate (X, caesar ):-
14  roman (X) , not_loyal (X, caesar ) .
15   loyal (X, caesar ):-
16  roman (X) , not ( hate (X, caesar ) ) .
17  not_loyal (X, Y):
18  assassinate (X, Y) .
19  GOAL
20   hate ( marcus , caesar ) .
```

Listing 2: Prolog Code for Solution Finding

Output

yes

3

Premises

1. All Pompeians are Romans.

2. All Romans were either loyal to Caesar or hated him.

3. Everyone is loyal to someone.

4. People only try to assassinate rulers they are not loyal to.

5. Marcus tried to assassinate Caesar.

6. Marcus was Pompeian.

Question

Did Marcus hate Caesar?

```
1   PREDICATES
2    horse (STRING) mammal(STRING) cow (STRING)
3    pig (STRING)
4    is_offspring (STRING, STRING) is_parent (STRING, STRING)
5    CLAUSES
6    mammal(X):
7   horse (X) ,
8   cow (X) ,
9    pig (X) ,
10   is_parent (_, X).
11   horse (Y):
12  is_parent (X, Y), horse (X) . horse ("Bluebeard") .
13   is_offspring (X, Y):
14  is_parent (Y, X) .
15   is_parent ("Bluebeard","Charlie") .
16  cow (" ?") .
17   pig (" ?") .
18   GOAL
19   horse ("Charlie ").
```

Listing 3: Prolog Code

Output

no

4

Premises

Bhogendra likes all kinds of food. Oranges are food. Chicken is food. Anything anyone eats and isn't killed by is food. If a person likes a food means that person has eaten it. Jogendra eats peanuts and is still alive. Shailendra eats everything Bhogendra eats.

Question

Does Shailendra like chicken?

```
PREDICATES
nondeterm likes (STRING, STRING) nondeterm food (STRING)
nondeterm eats(STRING, STRING) nondeterm kils(STRING, STRING)
CLAUSES
food ("orange") .
food ("chicken ") .
food (X):- likes (Y, X) ,
not (kills (X, Y) ) .
eats ("sailenda ,Y):- eats("bhogendra    , Y) .
eats (X, Y):- likes (X, Y) , food (Y) .
likes ("bhogendra     ,X):
food (X) . kills (_, _) .
GOAL
likes ("sailenda  , "chicken ").
```

Listing 4: Prolog Code for N queens problem

5

Premises

Dave and Fred are members of a dancing club in which no member can both waltz and jive. Fred"s dad can"t waltz and Dave can do whatever fred can"t do. If a child can do something, then their parents can do it also.

Prove

that there is a member of the dancing club who can"t jive

```
PREDICATES
 nondeterm likes (STRING, STRING)
nondeterm food (STRING)
 nondeterm eats(STRING, STRING)
 nondeterm kils(STRING, STRING)
CLAUSES
 food ("orange") .
 food ("chicken ") .
 food (X):-
likes (Y, X) ,
 not(kills (X, Y) ) .
 eats ("sailenda ,Y):- eats("bhogendra " , Y) .
 eats (X, Y):- likes (X, Y) , food (Y) .
 likes ("bhogendra " ,X):
food (X) .
kills (_, _) .
GOAL
 likes ("sailenda" , "chicken ").
```

Listing 5: Prolog code

Output

X = Dave