**Exercise 10.1**

Suppose we have the following database:

p(1).

p(2) :- !.

p(3).

Write all of Prolog's answers to the following queries:

?- p(X).

X = 1

X = 2

?- p(X),p(Y).

X = 1

Y = 1

X = 1

Y = 2

X = 2

Y = 1

X = 2

X = 2

?- p(X),!,p(Y).

X = 1

Y = 1

X = 1

Y = 2

**Exercise 10.2**

First, explain what the following program does:

class(Number,positive) :- Number > 0.

class(0,zero).

class(Number, negative) :- Number < 0.

The program determines the class of a number (positive if greater than 0, zero if equal to 0, or negative if less than 0).

Second, improve it by adding green cuts.

class(Number,positive) :- Number > 0, !.

class(0,zero) :- !.

class(Number,negative) :- Number < 0, !.

**Exercise 10.3**

Without using cut, write a predicate split/3 that splits a list of integers into two lists: one containing the positive ones (and zero), the other containing the negative ones. For example:

split([3,4,-5,-1,0,4,-9],P,N)

should return:

P = [3,4,0,4]

N = [-5,-1,-9].

split([],[],[]).

split([X|Xs],[X|P],N) :- X >= 0, split(Xs,P,N).

split([X|Xs],P,[X|N]) :- X < 0, split(Xs,P,N).

Then improve this program, without changing its meaning, with the help of cut.

split([],[],[]) :- !.

split([X|Xs],[X|P],N) :- X >= 0, !, split(Xs,P,N).

split([X|Xs],P,[X|N]) :- X < 0, !, split(Xs,P,N).