AYISHWARYA NARASIMHAN

RED ID :818473715

masc0877

PROLOG LAB 2

```
> vi prolog_hw2
"prolog_hw2"281 lines, 21500 characters (16000 null)
Script started on Tue Nov 10 13:03:10 2015
```

1) Write prolog code to numberize a list (like an alchemist, turn atoms into numbers), which can include tree constants, and perform superdeepnumberize on the list.

```
> vi superdeep.nl
"superdeep.nl" 31 lines, 569 characters
islist([]).
islist([A|B]):- islist(B).
memb([X|_]).
memb([Y|Z]):- islist(Y), memb(Y).
memb([_|Z]):- memb(Z).
superdeepnumberize([],[]).

superdeepnumberize([H|P],[M|N]):-
 islist(H),
 superdeepnumberize(H,M),
 superdeepnumberize(P,N).

superdeepnumberize([Y|P],[Y|N]):-
 number(Y),
superdeepnumberize([Y|P],[Y|N]):-
 number(Y),
 superdeepnumberize(P,N).

superdeepnumberize([H|P],[M|N]):-
 atom(H),
 M is 0,
 superdeepnumberize(P,N).

superdeepnumberize([Y|P],[H|Q]):-
 not(number(Y)),
 not(islist(Y)),
 not(atom(Y)),
 Y =..[T|Ys],
 superdeepnumberize(Ys,Hs),
 H =..[T|Hs],
```

```
 superdeepnumberize(P,Q),!.

> np
NU-Prolog 1.3
1?- consult(superdeep).
true.
2?- superdeepnumberize([14,a,b],X).
X = [14, 0, 0] ;
fail.
3?- superdeepnumberize([14,a(b,27,c(45,[g]))],X).
X = [14, a(0, 27, c(45, [0]))] ;
fail.
4?- superdeepnumberize([14,a([[[e]]])],X).
X = [14, a([[[0]]])] ;
fail.
5?- superdeepnumberize([1,2,3],X).
X = [1, 2, 3] ;
fail.
6?- exit(0).
```

2) word problem : Find who teaches what subject

```
> vi puzzle7.nl
"puzzle7.nl" 78 lines, 1622 characters
% Tuples below are of the form : [name,subject,gender,college]
% Clue given are as follows
% Clue 1 - latin & math engaged implies they are of different gender
% Clue 2 - Mr. Ames not engaged
% Clue 3 - chem & math room mates implies same college & same gender
% Clue 4 - chem teacher coaches football implies male
% Clue 5 - history & latin are engaged implies different gender
% Clue 6 - Ames, Brown, Clark went to different colleges

teaches(L) :- L = [[ames,_,_,_],[brown,_,_,_],[clark,_,_,_],
[davis,_,_,_]],
% Given input data facts:
                Colleges = [ucsd,sdsu,usd],
                member([ames,_,male,_],L),
                member([brown,_,male,_],L),
                member([clark,_,female,_],L),
                member([davis,_,female,_],L),
%
% Clue 1
%
                member([_,math,G1,C1],L),
                member([_,latin,G2,C1],L),
                opp(G1,G2),
                member(C1,Colleges),
%
% Clue 3 - Wrong clue given
%
%               member([_,math,G3,C3],L),
```

```
%               member([_,chem,G3,C3],L),
%               member(C3,Colleges),
%               (G3=male; G3=female),
%
% Clue 4
%
                member([_,chem,male,_],L),
%
% Clue 5 & Clue 2
%
                member([N1,history,G4,_],L),
                member([N2,latin,G5,_],L),
                opp(G4,G5),
                N1 \= ames,
                N2 \= ames,
%
% Clue 6
%
                member([ames,_,_,ucsd],L),
                member([brown,_,_,sdsu],L),
                member([clark,_,_,usd],L).
opp(female,male).
opp(male,female).

> np
NU-Prolog 1.3
1?- consult(puzzle7).
true.
2?- teaches(T).
T = [[ames, chem, male, ucsd], [brown, latin, male, sdsu], [clark,
histo
ry, female, usd], [davis, math, female, sdsu]] ;
fail.
3?- exit(0).
```

3) Write a functor named conc, that will concatenate two input atoms.It will work for numbers entered as single quoted strings, and thus treated as atoms. Other than that, write: Only works for atoms.

```
> vi conc.nl
"conc.nl" 4 lines, 185 characters

conc(X,Y,R):- not atom(Y), write('Only works for atoms'),nl.
conc(X,Y,R):- not atom(X), write('Only works for atoms'),nl.
conc(X,Y,R):-name(X,Xs),name(Y,Ys),append(Xs,Ys,A),name(R,A).

> np
NU-Prolog 1.3
1?- consult(conc).
true.
2?- conc(hot,dog,X).
X = hotdog
```

```
3?- conc(heinz,'57',Y).
Y = heinz57
4?- conc(4,sale,L).
Only works for atoms
L = L
5?- conc('','',L).
fail.
6?- conc(4,5,A).
Only works for atoms
A = A ;
Only works for atoms
A = A ;
fail.
7?- exit(0).
```

4) The goal is to find all players who are tied for the most home runs hit in a season, in this case ruth, foxx, and bonds. A really good solution will output all the holders of the record, without the user having to request additional solutions.

```
> vi maxhr.nl
"maxhr.nl" 14 lines, 198 characters

hr(1933,gehrig,50).
hr(1939,foxx,56).
hr(1999,mcguire,47).
hr(2005,bonds,56).
hr(2013,balasubramanian,49).

maxhr(P) :-
hr(Y, P, R),
\+ (hr(_,_, Rs), Rs > R),
write(P),
nl,
fail.
~
"maxhr.nl" 14 lines, 198 characters

> np
NU-Prolog 1.3
1?- consult(maxhr).
true.
2?- maxhr(X).
ruth
foxx
bonds
fail.
3?- exit(0).
> ^Dexit
script done on Tue Nov 10 13:09:56 2015
```