

Cosc 2P93: Prolog

Assignment #2

Due date: February 14th, 2012 (in class!)

1. Fun with Lists. Write Prolog predicates that do the following:

a) count(L,N): This counts the number of items in list L, which is N.

?- count([1,2,3,4,5],N).

N = 5.

b) tally(L,Q,N): This counts the number of instances of Q in list L, which is N.

?- tally([a,b,c,b,a],b,N).

N = 2.

c) removeItem(A,L,M): This removes item A from list L, resulting in list M. Backtracking removes subsequent instances of A from L.

?- removeItem(b,[a,b,c,b,a],M).

M = [a,c,b,a];

M = [a,b,c,a];

false.

note: Notice that the first 'b' to be removed is present in the second answer. That is required behaviour. This is a tricky one, so you may wish to do it last.

d) removeAll(A,L,M): This removes all instances of A from list L, resulting in M.

?- removeAll(b,[a,b,c,b,a],M).

M = [a,c,a].

e) removeGen(Type,A,L,M) will act like removeItem/3 if Type=one, and removeAll/3 if Type=all. If Type is neither, then it does nothing and fails.

f) writeList(L): This takes a list L, and writes each item on a new line on the terminal, with the count of that item at the start of the line.

?- writeList([howdy,there,folks]).

1 howdy

2 there

3 folks

2. Six Degrees of ~~Kevin Bacon~~ Bruce Campbell.

Bruce Campbell is the greatest actor that has ever lived, but obviously this is not news. Owing to the fact that Sam Raimi has included Campbell in many (most) of his projects in some form or another, Campbell has worked with quite a few people in movies and on television. As such, a great many actors/actresses can be connected to Bruce Campbell in 6 or less 'degrees'.

For reference, Campbell himself is the zeroth degree. Anyone who has worked with him directly is separated by one degree. Those who worked with those who worked with Campbell are separated by two degrees, etc.

Your task is to implement a predicate *check(A)*, that will determine whether or not a given actor/actress (A) is within six degrees of separation from Campbell, and also list the connections (ie. the common works between the link in the chain).

eg.

```
?- check(ewan_mcgregor).
bruce_campbell was in dark_man with liam_neeson
liam_neeson was in star_wars with ewan_mcgregor
true.
?- check(ronald_mcmadeupname).
false.
```

Note: It doesn't matter if it says that Campbell worked with Lawless, who worked with Campbell, who worked with Lawless, who worked with Hannah (or other such inefficient cycles), so long as it's still within six degrees. Refer to the last page for a list of sample starring performances, but you'll need to fill in more!

Make sure you include queries for actors who aren't listed at all, as well as for actors who are simply more than six degrees away (you'll probably have to add entries for this)

3. Calculating Your Campbell Number.

This is mostly an extension of #2. It is recommended that you complete that one first.

Suppose you wanted to know the *Campbell Number* of an actor or actress. The *Campbell Number* is simply the *minimum* degrees of separation between Campbell and a given actor/actress.

Your task will be to create a Prolog program that includes the predicate *campbellNumber(A)*, which determines the minimum degrees of separation from Bruce Campbell, *A*.

```
?- campbellNumber(kwyjibo).
kwyjibo has no Campbell Number.
?- campbellNumber(brendan_frasier).
brendan_frasier has a Campbell Number of 3.
```

Remember, unlike with #2, there is only one correct solution for a given query here.

Important: If you don't have a Campbell Number of 6 or less, you don't matter, and thus have none at all!

Refer to the last page for a list of sample starring performances, but you'll need to fill in more!

Make sure you include queries for actors who aren't listed at all, as well as for actors who are simply more than six degrees away (you'll probably have to add entries for this)

Submission Guidelines:

Print out all of your prolog code and include a sample of running any relevant queries.

(When queries are explicitly mentioned above, use those. Otherwise, include whatever is necessary to basically demonstrate your code. When deciding how many examples are necessary, remember this: Be nice to the marker, and he will be nice to you.)

Electronic submission is required. Slap your files into a dedicated directory on sandcastle, ssh (or putty) in, and run 'submit2p93'.

A cover page (with barcode) is still necessary.

Credit: Elements of this assignment are shamelessly stolen (more or less) from Brian Ross. Mwahaha.

Starring performances:

bruce_campbell army_of_darkness

bruce_campbell evil_dead

bruce_campbell xena

bruce_campbell darkman

lucy_lawless xena

liam_neeson darkman

liam_neeson star_wars

ewan_mcgregor star_wars

lucy_lawless spartacus

john_hannah spartacus

john_hannah the_mummy

brendan_fraser the_mummy

brendan_fraser journey_earth

seth_meyers journey_earth

seth_meyers snl

amy_poehler snl

tina_fey snl

mike_meyers snl

amy_poehler baby_mama

tina_fey baby_mama

mike_meyers austin_powers

heather_graham austin_powers