Program #7 30 points
Prolog Programming

1. (3 points) Write a functor append(X,Y,Z) which makes sure X and Y concatenate to create Z. Play with your function to make sure you can also decompose lists by typing something like append(X,Y, [1,2,23,4,5])
2. (3 points) Write a functor before(X,Y,L) which makes sure X appears before Y in the list L.
3. (3 points) Write the functor delete(X,Y,Z) which removes X from list Y giving list Z.
4. (3 points) Write the functor equalSets(X,Y) which makes sure X and Y are lists containing the same elements.
5. (3 points) Create a family data base having the following relations where parent(P,C) means P is the parent of C. Write the code to find siblings, but don’t let a person be their own sibling.

   parent(vicki,chelle).
   parent(vicki,kim).
   parent(julie, lindy).
   parent(julie,kate).
   parent(julie,stuart).
   parent(julie,scott).
   parent(lee, vicki).
   parent(lee, craig).
   parent(lee, cherri).
   parent(lee,steve).
   parent(lee, gary).
   parent(ursula,lee).
   parent(amelda,ursula).
   parent(cherri, lisa).
   parent(cherri,brandan).
   parent(cherri,ashley).
   parent(cherri, cara).
   parent(cherri,kacie).
   parent(cara,Hudson).
   parent(stuart, rivers).

6. (3 points) From your family data base, find cousins and grandparents.
7. (12 points) Use prolog to solve the puzzle below:

1. The owner of the blue house is not Alaina.
2. The Prolog programmer is not Vincent and doesn't own the brown house.
3. The Perl programmer doesn't own the crimson house.
4. The Haskell programmer is Samara.
5. The runner who finished with a time of "2" lives in the blue colored house.
6. Of the owner of the blue house and the Ruby programmer, one completed the race at "2" units and the other completed the race at "4" units.
7. The owner of the blue house finished before the owner of the crimson house.
8. Either the Prolog programmer or the Perl programmer lives in the green colored house.
9. The runner who finished with a time of "3" units is Vincent.
10. The owner of the blue house finished before Marisol.

colors([brown, crimson, blue, green]).
languages([perl, ruby, prolog, haskell]).
times([1,2,3,4]). //
runners(alaina, marisol, samara, vincent).

Hint: The solution to the puzzle below is on the website. Try it on your own, before peeking.

Four couples in all attended a costume ball.

The lady dressed as a cat arrived with her husband Matt.

Two couples were already there, one man dressed like a bear.

First to arrive wasn't Vince, but he got there before the Prince.

The witch (not Sue) is married to Chuck, who was dressed as Donald Duck.

Mary came in after Lou, both were there before Sue.

The Gipsy arrived before Ann, neither is partner to Batman.

If Snow White arrived after Tess, then how was each couple dressed?

Specifics:
The following lists of possible choices may be helpful.
man([vince, chuck, lou, matt]).
woman([sue, mary, ann, tess]).
costumeMan([batman, donald_duck, prince, bear]).
costumeWoman([witch, gipsy, cat, snow_white])

Use the functors defined in the first part of the assignment to help you solve the problem.
I used a list of lists as my data structure. So a solution might look like (where the order is the order in which they arrived):
[[vince,batman, ann, cat], [chuck, prince, tess, snow_white] ...]

I used equalSet to make sure that the set of answers I got (for any category) was exactly equal to the set of possible answers (so no one was left out and every name was used only once).

There are several forms of equal (and not equal).

Use "trace" to see where your problems are.
You can use an "or" by placing a ";" between parenthesized goals.