CS424: Programming Languages — Programming Assignment #3

Due: See Canvas — (20 points)

Problem Statement - Prolog Exercises

a) Write prolog logic that determines if two lists are disjoint (i.e. - do not have any elements in common). You may assume there are no nested lists inside of lists. *my example is running from a command line version; consult loads a file. Do not use any built-in set operations other than* ***member.***

```
?- consult('c:\\temp\\prog3.pl').
true.

?-disjoint([1, 2, 3, 7], [8, 7, 1]).
false.

?-disjoint([2, 3, 7], [8, 1]).
true.
```

b) Write logic to count the number of times an element appears in a list. You may assume there are no nested lists inside of lists.

```
?-countValues(1, [1, 2, 3, 1, 7], N).
N = 2

?- countValues(a, [a, a, b, a, a], C).
C = 4

?- countValues(a, [a, a, b, a, a], 3).
false
```

c) The following logic determines who are siblings in a family tree. What is the logic error?

```
male(doug).
male(paul).
female(beth).
parent(paul, doug).
parent(paul, beth).
sibling(X,Y) :- parent(Z, X), parent(Z, Y).
```

General Grading Rubric for Prolog:

Because a prolog program takes the form of a collection of facts and rules, it is not graded in the same manner as a structured, modular software project. Please follow these guidelines:

- Include your name and date in the comments at the top of the file.
- Group like rules together (rules with same name), if applicable.
- Grading will be dependent on the correct execution of your ruleset.
- Your prolog must execute correctly in swi-prolog, either online sandbox or installed version, not some other variant.
- If there is a built-in functor that solves one of these assigned problems, do not use it. Write your own. You may use the member of a list we developed in lecture.
- **Do not leave singleton warnings in your code**. Warnings in one set of facts / rules can affect the other parts of the file as well.
- **Please include all solutions in a single program file (.pl extension).** Test all of the logic in your file. Sometimes errors in one solution will appear to show up in another when you combine them into a single file.

HELPFUL DEBUGGING TIP! Prolog does not forget facts you've already told it. So, if you are revising your code/fact/ruleset, you probably need to restart the interpreter.

Prolog Environment: swi-prolog.org

The swi-prolog site allows you to download and install full prolog on your system. However, they also host an online prolog environment that will work in most browsers. The online version is sufficient for our assignment.