School of Electrical Engineering and Computer Science
University of Central Florida

April 10, 2006

PROLOG HOMEWORK — Prolog

Instructions

This assignment will be due on Friday, April 21 at 11:59pm. It will only be accepted late within 24 hours of the due date, after which it will not be accepted. Email to *cmillward@cs.ucf.edu*. To turn in, put all of your predicates in a file named by a concatenation of your first initial and last name with an extension ".prl". **Example:** John Doe would turn in *jdoe.prl*. **Problem 3 is extra credit.** It is worth 5 points, that could go towards your mid-term score.

Please write all of you own predicates. The only exception to this is that you may use the built in predicate **not**. If you need "helper" functions, please include them in your file.

Problem 1. Define predicates for "simple" family information.

All binary predicates of form `predicate(A,B)` in this exercise can be read as `A` is **predicate of** `B`, unless otherwise noted.

For this exercise you will be given a knowledge base containing info for three predicates: `parent/2`, `female/1`, and `male/1`.

You need to define the following predicates that will work for **any** family knowledge base:

- `mother/2`
- `brother/2`
- `niece/2`
- `cousin/2`
- `grandparent/2`

Example knowledge base

```
parent(alice,betty).
parent(alice,bob).
parent(alice,ricky).
parent(rebecca,alice).
parent(castro,betty).
parent(castro,bob).
parent(castro,ricky).
parent(dana,castro).
parent(dana,vince).
parent(vince,erma).
male(ricky).
male(vince).
male(bob).
male(castro).
female(alice).
female(betty).
female(dana).
female(erma).
female(rebecca).
```

Note! If you are going to test with your own KB (which is recommended!), be sure to define the gender of each person. Also, be sure that no one is their own brother or sister.

Problem 2. Design a predicate `segment/2` that tests if the first argument is a contiguous series of elements in the second argument.

Example usage

```
?- segment([2,3,4],[1,2,3,4]).
Yes
?- segment([3],[1,2,4]).
No
?- segment([],[1,2,4]).
Yes
?- segment([1,2,4],[]).
No
```

Problem 3. **Extra credit. Optional.** Design a predicate `bookends/3` that tests if the first argument is a prefix of third and the second is a suffix of the third.

Example usage

```
?- bookends([1],[2,3,4],[1,2,3,4]).
Yes
?- bookends([],[4],[1,2,3,4]).
Yes
?- bookends([1],[2,3],[1,2,3,4]).
No
```