Homework Assignment 1

Primer

This is a classical Prolog application. Given the following graph of possible flights between seven US cities:

![Graph of flights between US cities](http://www.ams.org)

Write a Prolog program that would check if there is a route from a city A to a city B:

Steps:

1. Encode your database of facts:

   ```prolog
   flight(fresno, seattle).
   flight(seattle, omaha).
   and so on.
   ```

2. Write the rules:

   What does it mean that there is a route from city A to city B? Well, we either have a direct connection, or we can go from A to some city from which we have a direct connection to B. This is written as:

   ```prolog
   route(A, B) :- flight(A, B).
   route(A, B) :- route(A, X), flight(X, B).
   ```
And that’s it.

Now you can ask Prolog if there is a route from a city to a city, for example:

```prolog
?- route(fresno, atlanta).
```

You do not have to turn in the primer, but it will be useful to code it, as a warm-up, and to get a sense of working in Prolog.

Note that the way the route rule was written is actually a recursion.

```prolog
route(A, B) :- flight(A, B).
```

is the base case, and:

```prolog
route(A, B) :- route(A, X), flight(X, B).
```

is the recursive step. Every time we apply the recursive step, we should be getting one city closer to the source.

**Homework assignment**

To be turned-in on Monday, April 11, 2005, in the discussion section, as a printout.

Given the partial family tree of the gods of the ancient Greeks encoded as a Prolog database:

```prolog
parent(chaos, gaea).
president(gaea, cyclope).
president(gaea, chronos).
president(gaea, coeus).
president(gaea, oceanus).
president(uranus, cyclope).
president(uranus, chronos).
president(uranus, coeus).
president(uranus, oceanus).
president(chronos, hades).
president(chronos, poseidon).
president(chronos, zeus).
president(rhea, hades).
president(rhea, poseidon).
president(rhea, zeus).
president(coeus, leto).
president(phoebe, leto).
president(leto, apollo).
president(leto, artemis).
president(zeus, apollo).
```
parent(zeus, artemis).
parent(oceanus, iapetus).
parent(tethys, iapetus).
parent(hera, ares).
parent(zeus, ares).
male(chaos).
male(cyclope).
male(uranus).
male(chronos).
male(coeus).
male(oceanus).
male(hades).
male(poseidon).
male(zeus).
male(ares).
male(apollo).
male(iapetus).
female(gaea).
female(rhea).
female(leto).
female(hera).
female(phoebe).
female(tethys).
female(artemis).

define rules for the following relationships:

a) father
b) mother
c) child
d) son
e) daughter
f) sibling
g) aunt