Computer Science & Engineering 341

Assignment 8: CLP(R) Warmup May 20, 1998
Due: May 29, 1998

Turn in a listing of your rules for Questions 2–4, and sample output showing them working correctly.

1. *You don't need to hand in anything for Question 1 – this is just to give you some practice.*

   Try and see Department. Define the `append` and `sum` relations as follows:

   ```
   append([],L,L).
   append([H|T],L,[H|U]) :- append(T,L,U).

   sum([],0).
   sum([X|Xs],X+S) :- sum(Xs,S).
   ```

   Try `append` on the following. In each case reject the answers to see what happens when CLP(R) backtracks.

   ```
   append([a,b,c],[w,x,y,z],L).
   append([a,b],Y,[a,b,c,d]).
   append([a,c],Y,[a,b,c,d]).
   append(X,Y,[a,b,c,d]).
   append(X,Y,Z).
   ```

   Now try `sum` on the following, again backtracking when possible.

   ```
   sum([5,10,20],N).
   sum([5,10,20],8).
   sum([5,X],100).
   sum([5,X,Y],100).
   sum(A,100).
   ```

2. Write and test a CLP(R) rule `again` that takes a list and returns a new list with each element repeated. For example:

   ```
   again([3,5,7],A) succeeds with A=[3,3,5,5,7,7]
   again(A,[1,1,3,3]) succeeds with A=[1,3]
   again(A,[1,1,3,4]) fails
   ```

3. Write and test a CLP(R) rule `average` that computes the average of a list of numbers. (You can just let it get a divide-by-zero error for an empty list.)

4. Exercise 11.5 in Sethi (page 471).