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], S).
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).