EE 4785 **Homework 1** **Due: 6 February 1995**

Problem 1: Extend the Fahrenheit/Celsius conversion program presented in class so that a polite error message is printed if the conversion cannot be done. (For example, if neither `F` nor `C` were bound to a number.). The material in Section 6.3 (pp. 112–113) of Clocksin & Mellish might be useful. See also lines 2913–2943 of /gate.ee.lsu.edu/usr/local/docs/prolog.txt.

Problem 2: Modify the recordings database in file /home/ee4785/class/cds.pro so that it includes recordings of musicals or opera (e.g., West Side Story, Nixon in China, Carmen). Each entry should include information on the music's composer, the lyricist, and two leading performers. The information should be organized so that the performers and writers are kept separate. The three field format (`cd(Name,Info,Year)`) should be maintained. Modify the search procedures to include the new entries.

Problem 3: A mathematician was working with three functions: $f_1(x) = 11x^2$, $f_2(x) = 7x$, and $f_3(x) = x^3$. The mathematician was composing the functions in threes and then computing values. For example, $f_1(f_2(f_3(x))) = 539x^6$. He was composing the functions in various combinations of 3 in order to compute the magic number 34496. The magic number might occur when $x = 2$, 3, or 4. Write a Prolog program which composes the three functions in all possible ways (repeats, *e.g.,* $f_1(f_1(f_2(x)))$ included) and then evaluates the expressions for $x = 2$, 3, or 4 until the desired combination is found. The program should display the value of x and the functions composed. The database will have the three functions written as three facts:

```
fun(f1,X,11*X*X).
fun(f2,X,7*X).
fun(f3,X,X*X*X).
```

The output of the program should look something like this:

```
 ?- solve.
info(f1,f2,f3) x= 2
yes
 ?-
```

In fact, the answer above is correct, that is, $f_1(f_2(f_3(2))) = 34496$.