1 A Telephone Database

To get a feel for Modula-2, implement the following:

- A generic linked list module `List`. Just implement the minimum set of operations to support the `Map` module below. `List` should be implemented as a separately compiled module. `List.T` should be an opaque type.

- A generic module `Map` that can map strings to a variety of data types. `Map` should support the operations `Create`, `Insert` and `Lookup`. Here is one possible use of `Map`:

```modula-2
VAR s : Map.T;
VAR x : ARRAY [1..10] OF CHAR;
s := Map.Create();
Map.Insert(s, "Lisa", "555-1212");
Map.Insert(s, "Bart", "555-1212");
Map.Insert(s, "Beast", 666);
Map.Lookup(s, "Lisa", x);
InOut.WriteLine(x);
```

In this case `Insert` and `Lookup` take an `ARRAY OF WORD` as their generic argument. You could also use `SYSTEM.ADDRESS`. `Map` should be implemented as a separately compiled module. `Map.T` should be an opaque type. Use the `List` module as the basis for your implementation. You can deal with errors (such as missing data) any way you wish (including ignoring them).

- A simple telephone database program `Phone` that reads instructions from standard input for inserting data or querying the database:

```
$ phone
  > I Lisa 555-1212
  > I Bart 555-BART
  > L Lisa
  555-1212
```

Here, I means insert and L lookup. `Phone` should be implemented as a separately compiled main module.

- A `makefile` that encodes the order of compilation between the modules. `make` should correctly build the program using the minimum number of compilations, regardless of which module part is touched.
2 Submission and Assessment

The deadline for this assignment is 10:30AM, Monday, March 3. You should submit the assignment electronically using the Unix command "\texttt{turnin cs520.7 <files>}". This assignment is worth 1\% of your final grade.

\textbf{Don't show your code to anyone, don't read anyone else's code, don't discuss the details of your code with anyone. If you need help with the assignment see the instructor.}