Deductive Database Exercise (33 points)

Due Friday May 17th

May 2, 2002

1 The EDB Schema

The following EDB contains information on objects and their (recursive) constituent structure. It also consists of information on companies and their owners. Finally it has some information on reports about companies - either philanthropic or abusive actions.

```
database({
  object(Name:string,
         Cost:integer,
         Manufacturer:string,
         Use:string),
  part(SuperObject:string,
       SubObject:string,
       Quantity:integer
       ),
  company(Name:string,
          Capitalization:real,
          Countries: any,
          Board: any),
  owns(Owner:string,
       Owned:string),
  report(Company:string,
         Type: string,
         Description:string)}).
```

You may find this file at `~mjm/LDL/schema.ldl`.

2 Some EDB facts

The following are a set of facts that may be loaded into the above schema. I suggest that you add additional facts. I will test your queries over a larger, more extensive test set.

```
object('Robo-Pig',5000,'Howard and Associates','Killer Robot').
object('Standard 4 inch wheel',1,'Greatyear','Wheel').
object('Standard Robot controller',200,'Robot Brains Inc.', 'Controller').
```

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```
object('80566 Processor',56, 'Imptel', 'CPU').

part('Robo-Pig','Standard 4 inch wheel',4).
part('Robo-Pig','Standard Robot controller',1).
part('Standard Robot controller', '80566 Processor', 1).

company('Howard and Associates',1.2,{'USA'},
        ['Monck Howard', 'Daffney Simmons']).
company('Greatyear',1222,{'USA', 'France', 'Germany', 'Brazil'},
        ['Preston Wha', 'Jesup Crawley']).
company('Imptel',345,{'USA', 'Mexico', 'Germany'},['Quack Levy']).
company('Robot Brains Inc.',102, {'Sweden', 'Denmark'},
        ['Sven Johansson']).
company('WWClean',12, {'USA'}, ['Polly-anna Pigeon']).
company('Grebbly',10000, {'USA'},['Horns Lucifer']).
company('Shistle Inc', 120, {'England','USA'}, ['Franky Rumph']).

owns('Grebbly','WWClean').
owns('WWClean','Imptel').
owns('Shistle Inc','Robot Brains Inc.').

report('Greebly',abuse,'Greebly dumped waste into the ocean').
report('Greebly',abuse,'Greebly fired 100000 workers').
report('Greebly',abuse,'Greebly lied to the government').
report('WWClean',philanthropy,'WWClean gave 20 dollars (in kind) to schools').
report('Shistle Inc',philanthropy,'Shistle started a college').
```

Again you may find this file at ˜mjm/LDL/facts.ldl.

3   Simple Queries

Build IDB predicates to answer the following queries.

- 1.) List the company names where the company has a capitalization greater than 2.1 (million). – one(Co,$Cap)

- 2.)   List the companies which have a location in the 'USA'. – two(Co,$Country)

- 3.) List companies names plus their chairman of the board (Chairmen are always the first element in the list of board members). – three(Co,Chair)

- 4.) Give the companies that are not (directly) involved in a report of abuse. – four(Co)

- 5.) List companies along with the number of products that the companies produce. –five(Co,Num)

4   Recursive Queries

- 6.) List all of the subparts of a 'Robo-Pig'. –six($Product,Parts)

- 7.) List all the companies involved in the construction of a 'Robo-Pig'. – seven(Co,$Product)

- 8.) List the companies that are not involved (nor are their owners, nor owner's owners, etc) in any reported abuse. –eight(Co)

- 9.) List the companies that are not involved in, nor are any of their owners (or owner's owners, etc) in any type of abuse. In addition none of the owners (nor the company itself) owns any company (or own a company that owns a company, etc) that is reported to have been abusive. –`nine(Co)`

- 10.) List all the products that are wholly produced by companies of the type in question 10. –`ten(Products)`

5 Extra-Credit – Making it real?

Let us assume that you were asked to supply the previous functionality in this assignment. But you were requested to do it in Visual Basic and MicroSoft access. Briefly describe (1-3 paragraphs) how you would go about this task. If you give an interesting and accurate analysis, I will give you 10 points of extra credit. Note that you must get 9 out of 10 of the previous queries correct to get this extra credit.

6 What to hand-in

A print out of your source codes and a log showing the results of each query. Plus send me the code. Give your predicates the names and export patterns that I have indicated.