Constructive Logic (15-317), Fall 2015
Recitation 9: Prolog Puzzles (10/14/2015)
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1   Professions

There are 4 men with last names Smith, Carpenter, Baker and Tailor. Very confusingly, their lastname does NOT correspond to their profession (either a tailor, baker, carpenter or smith). They each have a son. These sons have the same last name as their fathers, and even more confusingly, their professions do not correspond to their last names either. For example, Smith is not a smith, and SmithSon is also not a smith.

You also know:

1. No son has the same profession as his father.

2. Baker has the same profession as Carpenter's son.

3. Smith's son is a baker.

Find the professions of the fathers and the sons using a Prolog program.
Hints:

- Use a variable for each profession you are trying to find.

- It might be useful to encode the professions in a list.

- List membership may also be useful. Recall that the following rules define list membership:

```
member(X, [X|_]).
member(X,[H|T]) :- member(X:T).
```

- You can say that A is not B.
  Example:

```
A \= B
```

  Are there multiple solutions? If so, what constrains could you add to make it so there is only one solution?

2   Dessert

Four ladies meet each week and they always bring food.

1. Mrs. Andrew will bring chocolate cake.

2. Neither Mrs. Brown, nor Vivian nor Ann Clark will bring cookies.

3. Rachel, who is not the representative of the Davidson family at the gathering, will bring coffee.

4. Mary will not bring the wine.

use Prolog to determine the first and last name of each lady and what they are bringing to the gathering.
Hints:

- It might be useful to represent the situation as a list of lists where each inner list looks like:

```
[first, last, bringing]
```

- Once again decide on all the variables you need, use list membership and negation

How many solutions are there?