Constructive Logic (15-317), Spring 2021
Recitation 11: Prolog (4-14-2021)

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 constraints could you add to make it so there is only one solution?

2 Falses

Consider the following group of statements:

1. Only one of these statements is false
2. Only two of these statements is false
3. Only three of these statements is false
4. Only four of these statements is false
5. All five of these statements is false

Which, if any, is true?