

Logic Languages

11.6 Exercises

- 11.18 Restate the following Prolog rule in predicate calculus, using appropriate quantifiers:

```
sibling(X, Y) :- mother(M, X), mother(M, Y),  
                 father(F, X), father(F, Y).
```

- 11.19 Consider the following statement in predicate calculus:

$$\text{empty_class}(C) \leftarrow \neg \exists X [\text{takes}(X, C)]$$

- (a) Translate this statement to clausal form.
- (b) Can you translate the statement into Prolog? Does it make a difference whether you're allowed to use $\backslash +$?
- (c) How about the following:

$$\text{takes_everything}(X) \leftarrow \forall C [\text{takes}(X, C)]$$

Can this be expressed in Prolog?

- 11.20 Consider the seemingly contradictory statement

$$\neg \text{foo}(X) \rightarrow \text{foo}(X)$$

Convert this statement to clausal form, and then translate into Prolog. Explain what will happen if you ask

```
?- foo(bar).
```

Now consider the straightforward translation, without the intermediate conversion to clausal form:

$$\text{foo}(X) \text{ :- } \neg(\text{foo}(X)).$$

Now explain what will happen if you ask

$$?- \text{foo}(\text{bar}).$$