Exercise sheet 4

(Submit as a plain text email message to dm@ling.osu.edu before class on Thursday, 3. Feb)

1. Compare the three encodings in `dcg/append_encoding1.pl`, `dcg/append_encoding2.pl`, and `dcg/dcg_encoding.pl`: After starting a new prolog and loading one of the files, try parsing a string that is well-formed according to this grammar, and one that is not well-formed. Specifically, try parsing `s([a,clown,loves,a,clown])` and `s([paul,laughs])` (where it is intentional that `paul` is not in the lexicon) and trace the execution.

   (a) Report how the results of the two calls differ for the three grammars, and

   (b) explain why, i.e., characterize the steps taken by the system in trying to prove these goals. (For each of the six characterizations, a couple of sentences should suffice.)

   Remember that Control-C interrupts Prolog execution.

2. Consider the following small DCG grammar (on the web as file `ex4.pl`):

```
top_s --> s([],[]).
s(G1,G3) --> np(G1,G2), vp(G2,G3).

np([gap],[]) --> [].
np(G,G) --> [the, man], postmod.

postmod --> [].
postmod --> [who], s([gap],[]).

vp(G,G) --> [slept].
vp(G1,G2) --> [saw], np(G1,G2).
```

   Explain why this DCG accepts the string "the man who the man saw slept" but does not accept "the man who saw slept" as a `top_s`. (Less than ten sentences should be sufficient to explain this.)

3. Read Chapter 6 "Computability and Complexity" and Chapter 7 "Introduction to Parsing" from the lecture notes.