

# LIN 177 Homework 1

Hardy Jones  
999397426  
Professor Ojeda  
Winter 2015

1. 

```
laugh(hah).  
laugh(X-hah) :-  
    laugh(X).
```
2. 

```
?- ['blather.swipl'].  
% blather.swipl compiled 0.00 sec, 1 clauses  
true.  
  
?- word(X).  
X = blah ;  
X = blah-blah ;  
X = blah-blah-blah ;  
X = blah-blah-blah-blah ;  
X = blah-blah-blah-blah-blah ;  
X = blah-blah-blah-blah-blah-blah .
```
3.
  - Two options are the phrases, “Get the Led out.” and “Get the lead out.”  
The first means to listen to the band *Led Zeppelin*. The second means to remove the metal “lead” from something.
  - Two options are the phrases, “Susan’s mother is Carol.” and “The mother of Susan is Carol.”  
These two sound different, but have the same meaning of identifying Susan’s mother.

4. 

```
japanese([adamu], [nounphrase], [adam], [entity]).
japanese([iivu], [nounphrase], [eve], [entity]).
japanese([waraimasu], [verb, intransitive], [laughs], [property]).
japanese([nakimasu], [verb, intransitive], [cries], [property]).
japanese([mimasu], [verb, transitive], [watches], [relation]).
japanese([tetsudaimasu], [verb, transitive], [helps], [relation]).
japanese(VerbPhrase, [verbphrase], Property, [property]) :-
    japanese(VerbPhrase, [verb, intransitive], Property, [property]).
japanese(VerbPhrase, [verbphrase], Property, [property]) :-
    japanese(TransitiveVerb, [verb, transitive], Relation, [relation]),
    japanese(AccusativeNounPhrase, [nounphrase, accusative], Entity, [entity]),
    append(AccusativeNounPhrase, TransitiveVerb, VerbPhrase),
    append(Entity, Relation, Property).
japanese(AccusativeNounPhrase, [nounphrase, accusative], Entity, [entity]) :-
    japanese(NounPhrase, [nounphrase], Entity, [entity]),
    append(NounPhrase, [o], AccusativeNounPhrase).
japanese(Sentence, [sentence], Proposition, [proposition]) :-
    japanese(NominativeNounPhrase, [nounphrase], Entity, [entity]),
    japanese(VerbPhrase, [verbphrase], Property, [property]),
    reverse(CorrectProperty, Property),
    append(NominativeNounPhrase, [ga|VerbPhrase], Sentence),
    append(Entity, CorrectProperty, Proposition).
```

This grammar is principled.

We give rules for proper conjugation of accusative noun-phrases, for instance. Rather than enumerating all possible ways to construct an accusative noun-phrase, we instead give a rule that it's a normal noun-phrase with "o" appended to it.

5. 

```
spanish_japanese(Spanish, SpanishMeaning,
                 Japanese, JapaneseMeaning,
                 English, EnglishMeaning) :-
    spanish(Spanish, SpanishMeaning, English, EnglishMeaning),
    japanese(Japanese, JapaneseMeaning, English, EnglishMeaning).
```