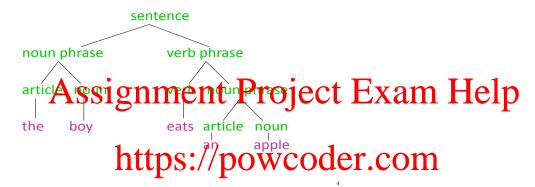
Prolog Tutorial 4 Language Processing in Prolog

Assume a grammar for very simple English:

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sentence --> nounphrase, verb phrase
noun phrase --> article, noun
verb phrase --> verb| verb, noun phrase
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providing, for example, the following parse tree for the sentence:

"The boy eats an apple."



With a simple Lexicon such as:

article --> the de WeChat powcoder noun --> boy | apple | song verb --> eats | sings

1. Write a Prolog program to check whether or not an English sentence is grammatically correct, according to the grammar. The program should also be able to generate grammatically correct sentences. For example:

"The boy eats an apple." is grammatically correct. "The boy eats a eats." is grammatically incorrect.

Do this by

- Representing sentences as a list of words, e.g. [the, boy, eats, an, apple]
- Defining a predicate *sentence/1*, and any other auxiliary predicate you need, such that *sentence(S)* succeeds if *S* is a correct grammatical sentence
- Testing the program with your own lexicon, e.g. nouns: grass, cow, computer, girl, boy, etc.

So for example:

- ?- sentence([a, cow, eats, the, grass]). Gets the answer yes.
- ?- sentence([girl, sings, eats]). Gets the answer no.
- ?- sentence(S).

Gets all instances of S that are grammatically correct.

You will get many ridiculous sentences (like [a, grass, eats, a, cow]), because the grammar is very simple – don't worry!

2. Modify the program for recognizing and constructing noun phrases so that it requires the article to match the noun in noun phrases, i.e. if the noun starts with a vowel then the article is either 'the' or 'an', not 'a', and if the noun starts with a consonant then the article is either 'the' or 'a', not 'an'. So, for example, [a, apple] and [an, cow] should not be recognized or generated as a noun phrases.

Hint. Protes is a sull-inplicate a of Cole Catch the Xaarin hat s(WL) Ducceeds when L is the list of characters in the constant W in the order in which they appear in W. So $atom_chars(apple, L)$ succeeds with L=[a,p,p,l,e].

- 3. Continue the work on natural language processing by extending the grammar given so far so that your program is more *context-sensitive*:
 - a) Make superior the hour late in the ho
 - b) How would you modify your program to avoid strings such as "a, grass, eats, a, cow", or "a, song, chews, the, grass" being recognized as sentences?