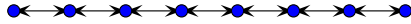


Notes on Grammars



Introduction

The set of rules that tell you whether a sentence is correctly structured is called a *grammar*. Here is a simple, and very incomplete, grammar for English:

```
sentence : nounPhrase verbPhrase PERIOD
nounPhrase : ARTICLE Adjective NOUN
verbPhrase : VERB nounPhrase
```

Given these nouns,

```
cow
water
dog
```

these articles,

```
the
a
```

these verbs,

```
drank
chased
```

and these adjectives,

```
large
cool
yappy
```

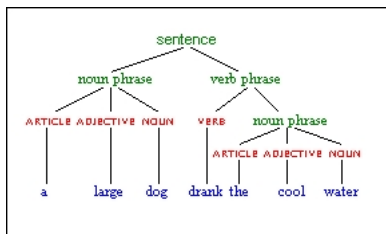
we can generate a number of syntactically correct sentences, such as:

```
The large cow drank the cool water.
A yappy dog chased the large cow.
The cool water chased the cool dog.
The yappy water drank a large cow.
```

Grammars can also be used to recognize syntactically correct sentences. For example, the sentence:

```
A large dog drank the cool water.
```

can be fit to the grammar above in the following way:



Note that the grammar above does not allow for the sentence:

```
The large yappy dog drank the water.
```

since the grammar requires a single adjective in a noun phrase. We can modify the grammar to allow sentences of this form (and still allow for the sentences that were allowed before modification):

```
sentence : nounPhrase verbPhrase PERIOD
nounPhrase : ARTICLE adjList NOUN
verbPhrase : VERB nounPhrase
adjList : ADJECTIVE | ADJECTIVE adjList
```

We can also allow for sentences like:

```
The dog drank water.
```

with a further modification:

```
sentence : nounPhrase verbPhrase PERIOD
nounPhrase : optArticle optAdjList NOUN
verbPhrase : VERB nounPhrase
optArticle : ARTICLE | *empty*
optAdjList : adjList | *empty*
adjList : ADJECTIVE | ADJECTIVE adjList
```

The newest modification is shown in blue.

Semantics

Syntax tells you if the sentence is constructed correctly. Semantics tells you whether a correctly structured sentence makes any sense. The sentence:

```
The box drank water
```

is correct syntactically speaking (subject then verb then object) but seems wrong since boxes don't drink. Semantics is handled in the *evaluation* stage.