From grammars to regular expressions

- **Grammars are used**
  - In computer science
  - In English, in Spanish, in all *natural* languages
  - In genomics, grammar of DNA?

- **Parsing** languages, what does parse mean?
  - Computer and other, how do we process statements in an automatic way?
  - How do we generate statements that are "correct"?

Regular Expressions and Grammars

- **Grammar hierarchy in terms of ‘power’**
  - Mathematical, formal model of language
  - Theoretically and practically interesting, e.g., processing spam, training spam filters, quickly looking through millions of files with `grep`


Grammars and Regex

```plaintext
<integer> ::= <digit> | <digit> <integer>
<digit> ::= 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
```

- Why is 1234 a valid integer? Is 01234 a valid integer?
  - How could we avoid leading zeros?
  - What about a floating point number?

- **Regular expressions: mathematical and applied**
  - Create regexps from . * ( | \ $ 
  - Understanding how these work best done by example

What good are regular expressions