A #lang for All Seasons

Ben Greenman,
Racket Con 2015
"One who remains true to himself and his beliefs while adapting to all circumstances and times, despite external pressure or influence"
iPoe
Interactive Poetry Editor
http://github.com/benmn/iPOe
Ye olde 2000 A.D. ...
Ye olde 2000 A.D. ...
Ye olde 2000 A.D. ...
Ye olde 2000 A.D. ...
Ye olde 2000 A.D. ...
Ye olde 2000 A.D. ...

- Load / Save
- Backspace / Insert
- Spellcheck

their vs. thier?
Ye 2010 A.D. ... How to use this new POWER?
MS Word, for poetry

- Multiple notions of correctness
- Rhyme scheme, visual appearance matter

What would an elegant solution look like?
Designing a solution

UI

DB

<table>
<thead>
<tr>
<th>ENTITY NAME</th>
<th>RAM HARDNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTITY IDENTIFIER</td>
<td>F4.10</td>
</tr>
<tr>
<td>DEFINITION</td>
<td>A measure of the resistance to penetration offered by the snowpack to a 40 mm wide cone with a 60 degree pitch. The cone is driven vertically down by a blow from a hammer typically of kg mass which is dropped from heights of 5 to 50 cm. The principal action is one of disaggregation involving both shear and compression (ref. Keeler 1967). Ram Hardness is expressed as a force (in Newtons). This is the product of its mass (kg) multiplied by the acceleration due to gravity (approx. 10 m/sec). Ram hardness gives an index of snow strength.</td>
</tr>
<tr>
<td>UNIQUE IDENTIFIER</td>
<td>Ram Hardness Id = Snow Profile Observation Id + Ram depth</td>
</tr>
<tr>
<td>VOLUME</td>
<td>Avalanche Technician</td>
</tr>
<tr>
<td>TRUSTEE</td>
<td>Avalanche Technician</td>
</tr>
<tr>
<td>ALIASES</td>
<td>Vertical Ram Hardness</td>
</tr>
<tr>
<td>ATTRIBUTE LIST</td>
<td>Ram Hardness Height</td>
</tr>
<tr>
<td>RELATIONSHIP LIST</td>
<td></td>
</tr>
</tbody>
</table>
Designing a solution

- class Poem
- class Sonnet
- class Couple
- class Limerick
- class Villanelle
- class Haiku
- class Stanza
- class Rhyme
- class ...
Issues with **class Poem**

- User-defined poem types?
- How to specify & select a type at runtime?
- Syntactic overhead

Did objects help at all?
Pope, 1734

#lang ipoe/couplet
Hope springs eternal in the human breast
Man never is, but always to be blest
Wright, 1960

```
#lang ipoe/haiku

Burning autumn leaves,
I yearn to make the bonfire
Bigger and bigger
```
#lang ipoe/limerick

Each computer, in theory, is suitable
To attack any problem computable.
This thesis (Church Turing),
Unproven, alluring,
Remains, as we speak, irrefutable
#lang ipoe
#:name couplet
#:description "Two rhyming lines"
#:rhyme-scheme {[A A]}
#lang ipoe
#:name haiku
#:description "No rhyme, but a strict number of syllables"
#:rhyme-scheme {[5 7 5]}
#lang ipoe
#:name limerick
#:description "Rhyme & syllables"
#:rhyme-scheme {
  [(A . *) (A . *)
   (B . *) (B . *)
   (A . *)]
}
The iPoe Library

• The ipoe language compiles a specification into a new language (ipoe/haiku, etc)

• Poems are "type-checked" when compiled
Adding a new language

- `mkdir -p new-poem/lang`
- Fill out `new-poem/lang/reader.rkt`
- `raco pkg install ./new-poem`
- Now use `#lang new-poem`
Sonnet

#lang ipoe
#:name english-sonnet
#:description "Shakespearean!"
#:syllables 10
#:rhyme-scheme {[A B A B]
[C D C D]
[D E D E]
[G G]}

Overrides wildcards (*)
Villanelle

#lang ipoe
#:name villanelle
#:description "Triplets with a refrain"
#:syllables 10
#:rhyme-scheme {
  [R1 B R2]   [A   B R1]   [A   B R2]
  [A   B R1]   [A   B R2]   [A   B R1 R2]
#:constraint (line=? (line 0 (stanza 0))
  (line 2 (stanza 1)) ...)
#lang i poe/villanelle

Do not go gently into that good night
Old age should burn and rave at close of day
Rage, rage against the dying of the light.

Though wise men at their end know dark is right,
Because their words had forked no lightning they
Do not go gentle into that good night.

...
Coming Attractions

- Metre checking (true iambic pentameter)
- Syntax highlighting by parts-of-speech
- Semantically useful rhyme suggestions

http://github.com/benmn/ipoe/issues