NEWICK-RUBY
A Gem for manipulating and displaying Newick format trees
by Jonathan Badger
WHAT IS NEWICK?

```plaintext
(((Human, Chimp), (((Whale, Cow), Pig), (Dog, Cat))));

(((Human: 0.0141, Chimp: 0.03056) 100: 0.021879999999999997, (((Whale: 0.03538, Cow: 0.0148) 53: 0.00713, Pig: 0.01394) 49: 0.00439, (Dog: 0.0104, Cat: 0.00935) 100: 0.00721)) 100: 0.038220000000000004) 100;
```
NEWICK-RUBY

- Routines for:
  - Comparison -- is ((Human, Chimp),(((Whale, Cow), Pig), (Dog, Cat))) actually the same tree as: (((Chimp, Human),((Dog, Cat),((Cow, Whale), Pig))))?
  - Tree Drawing -- make PDFs of Newick trees, including distances and support values
  - subtree extraction
  - Rerooting -- see example
  - Converting to distance matrix -- see example
  - All Object Based -- A NewickTree class made up of connected NewickNodes
REROOTING

Rooted On Pig

Rooted On Human/Chimp
## Distance Matrix

<table>
<thead>
<tr>
<th></th>
<th>Human</th>
<th>Chimp</th>
<th>Whale</th>
<th>Cow</th>
<th>Pig</th>
<th>Dog</th>
<th>Cat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human</td>
<td>0.000000</td>
<td>0.044660</td>
<td>0.121100</td>
<td>0.100520</td>
<td>0.092530</td>
<td>0.091810</td>
<td>0.090760</td>
</tr>
<tr>
<td>Chimp</td>
<td>0.044660</td>
<td>0.000000</td>
<td>0.137560</td>
<td>0.116980</td>
<td>0.108990</td>
<td>0.108270</td>
<td>0.107220</td>
</tr>
<tr>
<td>Whale</td>
<td>0.121100</td>
<td>0.137560</td>
<td>0.000000</td>
<td>0.050180</td>
<td>0.056450</td>
<td>0.064510</td>
<td>0.063460</td>
</tr>
<tr>
<td>Cow</td>
<td>0.100520</td>
<td>0.116980</td>
<td>0.050180</td>
<td>0.000000</td>
<td>0.035870</td>
<td>0.043930</td>
<td>0.042880</td>
</tr>
<tr>
<td>Pig</td>
<td>0.092530</td>
<td>0.108990</td>
<td>0.056450</td>
<td>0.035870</td>
<td>0.000000</td>
<td>0.035940</td>
<td>0.034890</td>
</tr>
<tr>
<td>Dog</td>
<td>0.091810</td>
<td>0.108270</td>
<td>0.064510</td>
<td>0.043930</td>
<td>0.035940</td>
<td>0.000000</td>
<td>0.019750</td>
</tr>
<tr>
<td>Cat</td>
<td>0.090760</td>
<td>0.107220</td>
<td>0.063460</td>
<td>0.042880</td>
<td>0.034890</td>
<td>0.019750</td>
<td>0.000000</td>
</tr>
</tbody>
</table>
USES

- My own Automated Phylogenetic Inference System (APIS)
- my various wrappers around tree inference programs, such as PAUP and PHYLIP
- Packaged as gem by request, so perhaps more things by other people soon.