Numbers and Colors
translating William Carlos Williams...

ly sfə stu spo ɟɛɖɪnə-f kɪ ñʊ̞-ty bɔ-tɔ.
I before now eat plum-PL within container-NOM cold-LOC.

ly ɣrɛʃkʊ t’e la sfə stu ɣiʃu
I believe EMB.CL.START you before now save

t’e la spo ʔrata-f kɹo stu t’ə t’ə.
EMB.CL.START you eat that-PL after now EMB.CL.END EMB.CL.END

-- mɪnɔxɛve

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translating William Carlos Williams…

It-plums-in-icebox have-PST-make-it-eaten.food-1SG

be-bu-za-vε-gæb-vo.

probably PST-CONTINUING-make-it-reserved-2SG-IO-UNSPECIFIED breakfast

bov3vbab bu-bo-za-vε-vɛvzøv-vu-dʒo-va

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translating William Carlos Williams...

\[ p^a-ma \ \chi_a \etae-\etaenigu \ bo \ ki-ma \ \bar{\scriptstyle j}i-\bar{\scriptstyle f}i \ \text{nonigo} \ \thetaae \]
eat-RCNT.PAST \ I \ PL-plum \ that \ be-RCNT.PAST \ PL-one \ freezer \ inside

\[ bo \ \text{gabu-ma-} \betaae \ \chi_a \ \text{na} \chiiko \ \text{sae} \]
that \ keep-RCNT.PST-PROB \ you \ breakfast \ for

‘I have eaten the plums that were in the icebox,
and which you were probably saving for breakfast’

--Zak\textsuperscript{ho}

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for your next (completely optional) trick:

translate either:

a Zen koan (many can be found through The Zen Site)

or one of Jack Handey’s Deep Thoughts

I’ll display your morpheme-by-morpheme gloss, but not your translation, and we’ll see if people can figure out what you’ve translated.
Numbers

first point: not all languages have numbers (or as many as we’re used to).
Numbers

first point: not all languages have numbers (or as many as we’re used to).

Lardil **warrnge** ‘one’, **kiyan** ‘two’, **mungkalan** ‘three’ (sort of)
Numbers

first point: not all languages have numbers (or as many as we’re used to).

Lardil **warrnge** ‘one’, **kiyan** ‘two’, **mungkalan** ‘three’ (sort of)

Warlpiri **jika** ‘six’ (< English ‘six’)
  - **wirlki** ‘seven’ (and also ‘hooked boomerang’)
  - **milpa** ‘eight’ (and also ‘eyes’)
  - **kardaku** ‘nine’ (and also ‘cup’)

Numbers

It’s common for languages to borrow numbers, even if they already have them.

The new system then either replaces the old system completely, or you get two systems, for counting different things.

(e.g., Tagalog uses Tagalog numerals for most things, but Spanish numerals for weights, measures, ages beyond nine…)

(and Japanese has Japanese numbers for ‘default’ counting, but Chinese numbers for most other things; more about that later)
Numbers

If you decide to create a number system for your language, questions to ask yourself...
Numbers

- how much ‘irregularity’ is there?

*Mandarin*

- sān ‘three’
- shí ‘ten’
- shíshān ‘thirteen’
- sānshí ‘thirty’
Numbers

• how much ‘irregularity’ is there?

*Mandarin*

sān ‘three’
shí ‘ten’
shísān ‘thirteen’
sānshí ‘thirty’

Once you know the first ten numbers in Mandarin, you’re ready to count to 99.
Numbers

- how much ‘irregularity’ is there?

Mandarin

sān  ‘three’
shí  ‘ten’
shísān  ‘thirteen’
sānshí  ‘thirty’

Once you know the first ten numbers in Mandarin, you’re ready to count to 99.

Once you know the first ten numbers in English... you’re ready to learn some more numbers (eleven, twelve, twenty...)

(some of the following data on numbers are from http://www.sf.airnet.ne.jp/ts/language/number.html).
Numbers

- how much ‘irregularity’ is there?
- which base(s) will you use?

**Huli**

<table>
<thead>
<tr>
<th>Number</th>
<th>Huli</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>mbira</td>
<td>‘1’</td>
<td>nguira-ni mbira ‘16’ (‘15 and 1’)</td>
</tr>
<tr>
<td>kira</td>
<td>‘2’</td>
<td>nguira-ni kira ‘17’ (‘15 and 2’)</td>
</tr>
<tr>
<td>tebira</td>
<td>‘3’</td>
<td>…</td>
</tr>
<tr>
<td>maria</td>
<td>‘4’</td>
<td>ngui ki ‘30’ (‘2 15s’)</td>
</tr>
<tr>
<td>duria</td>
<td>‘5’</td>
<td>ngui ki, ngui tebone-gonaga mbira ‘31’ (‘2 15s, 1 of the third 15’)</td>
</tr>
<tr>
<td>waragaria</td>
<td>‘6’</td>
<td>…</td>
</tr>
<tr>
<td>karia</td>
<td>‘7’</td>
<td>…</td>
</tr>
<tr>
<td>halira</td>
<td>‘8’</td>
<td>ngui waraga, ngui kane-gonaga pira ‘100’ (‘6 15s, 10 of the 7th 15’)</td>
</tr>
<tr>
<td>dira</td>
<td>‘9’</td>
<td>…</td>
</tr>
<tr>
<td>pira</td>
<td>‘10’</td>
<td></td>
</tr>
<tr>
<td>bearia</td>
<td>‘11’</td>
<td></td>
</tr>
<tr>
<td>hombearia</td>
<td>‘12’</td>
<td></td>
</tr>
<tr>
<td>haleria</td>
<td>‘13’</td>
<td></td>
</tr>
<tr>
<td>deria</td>
<td>‘14’</td>
<td></td>
</tr>
<tr>
<td>nguira</td>
<td>‘15’</td>
<td></td>
</tr>
</tbody>
</table>
Numbers

- how much ‘irregularity’ is there?
- which base(s) will you use?

**Basque**

<table>
<thead>
<tr>
<th>Basque</th>
<th>English</th>
<th>Basque</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>bat</td>
<td>‘1’</td>
<td>hogeia ta bat</td>
<td>‘21’</td>
</tr>
<tr>
<td>bi</td>
<td>‘2’</td>
<td>hogeia ta bi</td>
<td>‘22’</td>
</tr>
<tr>
<td>hiru</td>
<td>‘3’</td>
<td>hogeia ta hiru</td>
<td>‘23’</td>
</tr>
<tr>
<td>lau</td>
<td>‘4’</td>
<td>hogeia ta lau</td>
<td>‘24’</td>
</tr>
<tr>
<td>bost</td>
<td>‘5’</td>
<td>hogeia ta bost</td>
<td>‘25’</td>
</tr>
<tr>
<td>sei</td>
<td>‘6’</td>
<td>hogeia ta sei</td>
<td>‘26’</td>
</tr>
<tr>
<td>zazpi</td>
<td>‘7’</td>
<td>hogeia ta zazpi</td>
<td>‘27’</td>
</tr>
<tr>
<td>zortzi</td>
<td>‘8’</td>
<td>hogeia ta zortzi</td>
<td>‘28’</td>
</tr>
<tr>
<td>bederatzi</td>
<td>‘9’</td>
<td>hogeia ta bederatzi</td>
<td>‘29’</td>
</tr>
<tr>
<td>hamar</td>
<td>‘10’</td>
<td>hogeia ta hamar</td>
<td>‘30’</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>hogeia ta hamaika</td>
<td>‘31’ (‘20-11’)</td>
</tr>
<tr>
<td>hogei</td>
<td>‘20’</td>
<td>hogeia ta hamabi</td>
<td>‘32’ (‘20-12’)</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>berrogeia</td>
<td>‘40’ (‘2 20s’)</td>
</tr>
<tr>
<td>ehun</td>
<td></td>
<td></td>
<td>‘100’</td>
</tr>
</tbody>
</table>
Numbers

• how much ‘irregularity’ is there?
• which base(s) will you use?

Ndom

sas ‘1’
thef ‘2’
ithin ‘3’
thonith ‘4’
meregh ‘5’
mer ‘6’
mer abo sas ‘7’ (‘6 and 1’)
mer abo thef ‘8’ (‘6 and 2’)
...
mer an thef ‘12’ (‘6 times 2’)
mer an thef abo sas ‘13’ (‘6 times 2, and 1’)
...
tondor ‘18’
tondor abo sas ‘19’ (‘18 and 1’)
nif ‘36’
Numbers

- how much ‘irregularity’ is there?
- which base(s) will you use?

Alamblak
(has words for 1, 2, 5, and 20. Everything else is a combination of those...)

rpat  ‘1’
hosf  ‘2’
hosfirpat  ‘3’ (2 and 1)
hosfihosf  ‘4’ (‘2 and 2’)
tir yohht  ‘5 exact’
tiryohtti rpat  ‘6’ (‘5 exact and 1’)
...
tir hosf  ‘10’ (‘2 5s’)
...
yima yohht  ‘20 exact’
...
yima tir yohht  ‘100’ (‘20 times 5 exact’)

Numbers

- how much ‘irregularity’ is there?
- which base(s) will you use?
- how much ‘addition and subtraction’?

**Yoruba**

ikan  ‘1’
meji  ‘2’
meta  ‘3’
merin ‘4’
marun ‘5’
mefa  ‘6’
meje  ‘7’
mejo  ‘8’
mesan ‘9’
mewa  ‘10’
Numbers

• how much ‘irregularity’ is there?
• which base(s) will you use?
• how much ‘addition and subtraction’?

Yoruba

ikan ‘1’
meji ‘2’
meta ‘3’
merin ‘4’
marun ‘5’
mefa ‘6’
meje ‘7’
mejo ‘8’
mesan ‘9’
mewa ‘10’
ogun ‘20’
Numbers

• how much ‘irregularity’ is there?
• which base(s) will you use?
• how much ‘addition and subtraction’?

**Yoruba**

ikan ‘1’
meji ‘2’
meta ‘3’
merin ‘4’
marun ‘5’
mefa ‘6’  merindilogun ‘16’ (‘4 from 20’)
meje ‘7’  metadilogun ‘17’ (‘3 from 20’)
mejo ‘8’  mejidilogun ‘18’ (‘2 from 20’)
mesan ‘9’  mokandilogun ‘19’ (‘1 from 20’)
mewa ‘10’  ogun ‘20’
Numbers

- how much ‘irregularity’ is there?
- which base(s) will you use?
- how much ‘addition and subtraction’?

Yoruba

ikan ‘1’
meji ‘2’
meta ‘3’
merin ‘4’
marun ‘5’
medogun ‘15’ (‘??-20’)
mefa ‘6’
merindilogun ‘16’ (‘4 from 20’)
meje ‘7’
metadilogun ‘17’ (‘3 from 20’)
mejo ‘8’
mejidilogun ‘18’ (‘2 from 20’)
mesan ‘9’
mokandilogun ‘19’ (‘1 from 20’)
mewa ‘10’
ogun ‘20’
Numbers

- how much ‘irregularity’ is there?
- which base(s) will you use?
- how much ‘addition and subtraction’?

**Yoruba**

<table>
<thead>
<tr>
<th>Number</th>
<th>Yoruba</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ikan</td>
<td>1 ‘one’</td>
</tr>
<tr>
<td>2</td>
<td>meji</td>
<td>2 ‘two’</td>
</tr>
<tr>
<td>3</td>
<td>meta</td>
<td>3 ‘three’</td>
</tr>
<tr>
<td>4</td>
<td>merin</td>
<td>4 ‘four’</td>
</tr>
<tr>
<td>5</td>
<td>marun</td>
<td>5 ‘five’</td>
</tr>
<tr>
<td>6</td>
<td>mefa</td>
<td>6 ‘six’</td>
</tr>
<tr>
<td>7</td>
<td>meje</td>
<td>7 ‘seven’</td>
</tr>
<tr>
<td>8</td>
<td>mejo</td>
<td>8 ‘eight’</td>
</tr>
<tr>
<td>9</td>
<td>mesan</td>
<td>9 ‘nine’</td>
</tr>
<tr>
<td>10</td>
<td>mewa</td>
<td>10 ‘ten’</td>
</tr>
<tr>
<td>11</td>
<td>mokanla</td>
<td>11 ‘one-teen’</td>
</tr>
<tr>
<td>12</td>
<td>mejila</td>
<td>12 ‘two-teen’</td>
</tr>
<tr>
<td>13</td>
<td>metala</td>
<td>13 ‘three-teen’</td>
</tr>
<tr>
<td>14</td>
<td>merinla</td>
<td>14 ‘four-teen’</td>
</tr>
<tr>
<td>15</td>
<td>medogun</td>
<td>15 ‘five-teen’</td>
</tr>
<tr>
<td>16</td>
<td>merindilogun</td>
<td>16 ‘six-teen’</td>
</tr>
<tr>
<td>17</td>
<td>metadilogun</td>
<td>17 ‘seven-teen’</td>
</tr>
<tr>
<td>18</td>
<td>mejidilogun</td>
<td>18 ‘eight-teen’</td>
</tr>
<tr>
<td>19</td>
<td>mokandilogun</td>
<td>19 ‘nine-teen’</td>
</tr>
<tr>
<td>20</td>
<td>ogun</td>
<td>20 ‘ten’</td>
</tr>
</tbody>
</table>
Numbers

• how much ‘irregularity’ is there?
• which base(s) will you use?
• how much ‘addition and subtraction’?
• what order do the places go in?

German zweiundzwanzig ‘22’ (‘two and twenty’)

Malagasy roa amby roapolo ‘22’ (‘two and twenty’)

enina amby dimampolo sy efajato ‘456’
(‘six and fifty and four hundred’)

23
Numbers

• how much ‘irregularity’ is there?
• which base(s) will you use?
• how much ‘addition and subtraction’?
• what order do the places go in?
• which powers of your base have their own names?

Nukuoro

hulu ‘10’
lau ‘100’
mano ‘10³’
-mada ‘10⁴’
-guli ‘10⁵’
-loo ‘10⁶’
-ngaa ‘10⁷’
-muna ‘10⁸’
-bugi ‘10⁹’
-baga ‘10¹⁰’
Numbers

- how much ‘irregularity’ is there?
- which base(s) will you use?
- how much ‘add ition and subtraction’?
- what order do the places go in?
- which powers of your base have their own names?
- what is the syntactic status of numbers?

(are they adjectives? nouns? different numbers are different?)

common Algonquian pattern: numbers 1-5 can modify nouns directly, but numbers 6-10 need an additional morpheme:

na’n-ijig  ji’nm-ug  asugom  te’s-ijig  ji’nm-ug  (Mi’gmaq)
five-AN.PL  man-PL  CLASS-AN.PL  man-PL
‘five men’  ‘six men’
Numbers

- how much ‘irregularity’ is there?
- which base(s) will you use?
- how much ‘addition and subtraction’?
- what order do the places go in?
- which powers of your base have their own names?
- what is the syntactic status of numbers?

(are they adjectives? nouns? different numbers are different?)

**Russian**

<table>
<thead>
<tr>
<th>Russian</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>odin stol</td>
<td>‘one table’</td>
</tr>
<tr>
<td>dva stol-a</td>
<td>‘two table-GEN.SG’</td>
</tr>
<tr>
<td>pjat’ stol-ov</td>
<td>‘five tables-GEN.PL’</td>
</tr>
</tbody>
</table>
Numbers

- how much ‘irregularity’ is there?
- which base(s) will you use?
- how much ‘addition and subtraction’?
- what order do the places go in?
- which powers of your base have their own names?
- what is the syntactic status of numbers?
- does your language have numeral classifiers?

<table>
<thead>
<tr>
<th>Japanese</th>
<th>Chol</th>
</tr>
</thead>
<tbody>
<tr>
<td>futa-ri</td>
<td>cha’-ts’ijty</td>
</tr>
<tr>
<td>ni-satu</td>
<td>cha’-pajl</td>
</tr>
<tr>
<td>ni-mai</td>
<td>cha’-tyek</td>
</tr>
<tr>
<td>two-PERSON</td>
<td>two-LONG.SKINNY</td>
</tr>
<tr>
<td>two-VOLUME</td>
<td>two-BUNCH</td>
</tr>
<tr>
<td>two-SHEET</td>
<td>two-TREE</td>
</tr>
</tbody>
</table>
Advanced topics:
• ordinal numbers (*first, second, third...*)
• fractions
• modified numbers (*at least seven, more than six, eight or more*)
• ....
Colors

Languages vary in how rich their color vocabularies are.
Colors

Languages vary in how rich their color vocabularies are.

Dani: ‘dark’ and ‘light’

English: …
Colors

common choice points:
  • having a single word for blue and green
  • dividing ‘blue’ into dark and light blue (e.g., Russian)
Colors

• very common for them to be based on nouns
  (e.g., orange, Lardil *kandukan* ‘red’ (<*kandu* ‘blood’))
Colors

It’s not uncommon for a term to be restricted in what it can refer to…

• English *blond* (for that matter, *red* hair is not red, and *white* skin is not white…)
• Tagalog *kayumanggi*
• Japanese traffic lights
• Tibetan *sgon-po* ‘blue, but also plants’, *ljangkhu* ‘green, except for plants’
Colors

other things to think about:
  • a productive way of making new colors
    (*ash-colored, coffee-colored*)
  • modifying colors (*light brown, dark blue, yellow-ish*)
24.917 ConLangs: How to Construct a Language Fall 2018

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