The Fourteenth
Annual
North American
Computational
Linguistics
Open
Competition
2020

Open Round
January 23, 2020

SOLUTIONS

Serious language puzzles that are surprisingly fun!

-Will Shortz, Crossword editor of The New York Times and Puzzlemaster for NPR
(A) Let That Mongo! (1/1) [5 points]

A1.

Each Mongo verb has a root form. The 4 verb forms shown here are formed by adding a prefix before the root form. The prefix for the imperative form is \(Ø\) (i.e. there is no apparent prefix), the prefix for the 2nd singular form is \(o\), the prefix for the 3rd singular form is \(a\), and the prefix for the 3rd plural form is \(ba\).

However, we are not done yet: To get the final verb form, we must apply some sound change rules. The relevant rules are:

1. If there are two vowels, in a row, delete the first one
2. Delete \(b\) when it appears between two vowels
3. Change \(o\) to \(w\) when it appears before a vowel

There is one final wrinkle: The order that these rules are applied in matters. The rules must be applied in this order: First apply rule 3, then rule 1, then rule 2.

A2.

<table>
<thead>
<tr>
<th>Imperative</th>
<th>2nd singular</th>
<th>3rd singular</th>
<th>3rd plural</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>bakisa</td>
<td>oakisa</td>
<td>aakisa</td>
<td>baakisa</td>
<td>‘add’</td>
</tr>
<tr>
<td>anda</td>
<td>wanda</td>
<td>anda</td>
<td>banda</td>
<td>‘begin’</td>
</tr>
<tr>
<td>solola</td>
<td>osolola</td>
<td>asolola</td>
<td>basolola</td>
<td>‘chat’</td>
</tr>
<tr>
<td>ponama</td>
<td>oponama</td>
<td>aponama</td>
<td>baponama</td>
<td>‘elect’</td>
</tr>
<tr>
<td>bowa</td>
<td>oowa</td>
<td>aoa</td>
<td>baowa</td>
<td>‘cure’</td>
</tr>
<tr>
<td>balusa</td>
<td>oalusa</td>
<td>aalusa</td>
<td>baalusa</td>
<td>‘turn’</td>
</tr>
<tr>
<td>longa</td>
<td>olonga</td>
<td>aonga</td>
<td>balonga</td>
<td>‘win’</td>
</tr>
</tbody>
</table>
(B) A Cat in a Hat (1/1) [15 Points]

B1.

1. g   2. l   3. i   4. m
5. c   6. o   7. k   8. d
9. n   10. a  11. p  12. b
13. h  14. e  15. f  16. j

B2.

a. topibeʔ menwa yuŋno
b. joge waniŋ khoŋno
c. awama bajarbeʔ yuŋno
d. nam

B3.

a. There is rice in my mouth.
b. My father went away.
c. My mother-in-law is with my mother.
(C) Set in Stone (1/1) [20 Points]

C1.

25. X    26. C
(D) Pay Attention (1/1) [10 Points]

D1.
A. 6
B. 5
C. 3
D. 2
E. 7
F. 1
G. 4

D2.
(a) 1 → 2, 4 → 6
(b) 1 → 5, 9 → 13
(c) 9 → 11
(d) None
(e) None
(f) 6 → 7
(g) 10 → 11
(h) 1 → 2
(i) 10 → 7
(E) Breton Numbers (1/1) [15 Points]

E1.

a. pevar-urgent ÷ pemp = c’hwezek \[80 ÷ 5 = 16\]
b. pemp ha hanter kant – daouzek = tri ha daou-urgent \[55 − 12 = 43\]
c. nav warn urgent + pevarzek = tri ha daou-urgent \[29 + 14 = 43\]
d. kant ÷ urgent = pemp \[100 ÷ 20 = 5\]

E2.

(b) daoulagad
Some languages have “dual”-style plurals for objects which occur in nature in pairs (such as eyes, ears, etc.), and thus the plural for “eyes” in Breton contains the element daou (2).

E3.

18
(F) Coming Into Focus (1/1) [15 Points]

F1.

a. sitarang nua uqaɭay tua quma a vatu
b. tjalawan nua supulingaw tua kuqaya-qayam a gadu nua tsemas
c. djmavis tua vavuy a vavaian

F2.

a. You protect the shaman’s bird with the spirit.
   anema a kusitarang tua qaya-qayam nua pulingaw?

b. The man eats the pig in the mountain.
   anema a kanen nua uqaɭay i tua gadu?

c. I anger your dog in my field.
   inu a sutjalawan tua kuvatu?
## (G) Password Confusion (1/1) [10 Points]

### G1.

<table>
<thead>
<tr>
<th>Text message</th>
<th>Distractor password</th>
<th>Larry’s password guess</th>
<th>Harry’s password guess</th>
<th>Correct password</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happy animals that will investigate telescopes can hop.</td>
<td>HAT WITCH</td>
<td>CHAT WITH</td>
<td>WHAT ITCH</td>
<td>CHAT WITH</td>
</tr>
<tr>
<td>All North Dakotan deviled eggs should seem especially radiant today.</td>
<td>AND DESSERT</td>
<td>SAND DESERT</td>
<td>SAND DESERT</td>
<td>SAND DESERT</td>
</tr>
<tr>
<td>Aardvarks may publicly label each spanning tree algorithm talented</td>
<td>AMPLE STATUSES</td>
<td>SAMPLE STATUSES</td>
<td>MAPLE STATUSES</td>
<td>MAPLE STATUSES</td>
</tr>
<tr>
<td>unicorns should enthusiastically see.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anyone rabbits might surprise has elicited a response that has satisfied.</td>
<td>ARMS HEARTS</td>
<td>HARMS HEARTS</td>
<td>MARS HEARTS or MARSH EARTHS</td>
<td>HARMS EARTHS</td>
</tr>
</tbody>
</table>

### G2.

<table>
<thead>
<tr>
<th>Text message</th>
<th>Distractor password</th>
<th>Larry’s password guess</th>
<th>Harry’s password guess</th>
<th>Correct password</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark’s emptiest factory is exporting some pasta Russia is cooking each</td>
<td>DEFIES PRICES</td>
<td>DEFIES PRINCES</td>
<td>DEFINES PRICES</td>
<td>DEFINES PRICES</td>
</tr>
<tr>
<td>Saturday.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unions Nepal is forbidding over recent major events during breakfast are</td>
<td>UNIFORMED BAKER</td>
<td>UNIFORMED BANKER</td>
<td>UNINFORMED BAKER</td>
<td>UNIFORMED BANKER</td>
</tr>
<tr>
<td>keeping exceptional records.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(H) The Idalion Tablet (1/1) [10 Points]

G1.

helei

athanas

katethiyan

dowenai

G2.

(a) “and”

kas

(b) “king”

basileus

(c) “instructed”

anōgon