SOLUTIONS

The Fourteenth Annual

North American Computational Linguistics Open Competition 2020

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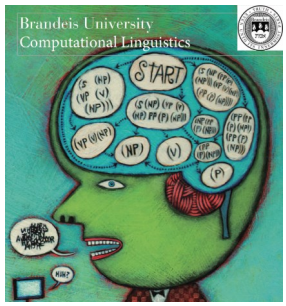


Open Round
January 23, 2020

Serious language puzzles that are surprisingly fun!

-Will Shortz, Crossword editor of The New York Times and Puzzlemaster for NPR

(A) Let That Mongo! (1/2) [Solution]

A1. Two solutions are possible. One solution is:

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., no 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**.

Same solution, in table format:

(1)	**Ø-**	(8)	**vowels**
(2)	**o-**	(9)	**o**
(3)	**a-**	(10)	**w**
(4)	**ba-**	(11)	**vowel**
(5)	**vowels**	(12)	**3**
(6)	**the first one**	(13)	**1**
(7)	**b**	(14)	**2**

The other possible solution is:

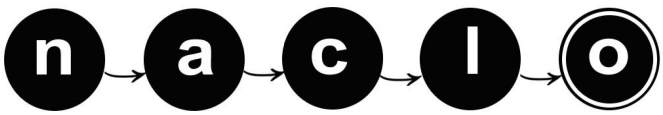
Each Mongo verb has a root form. The 4 verb forms shown here are formed by adding a prefix before the root form. The prefix for the imperative form is **Ø-** (i.e., no prefix), the prefix for the 2nd singular form is **w-**, the prefix for the 3rd singular form is **a-**, and the prefix for the 3rd plural 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 **w** to **o** when it appears before a **consonant**.

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 **1**, then rule **3**, then rule **2**.

(see next page table format of this second solution)



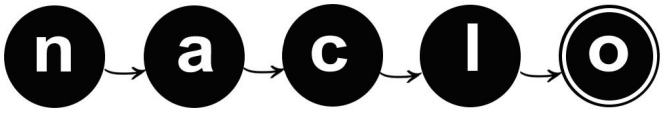
(A) Let That Mongo! (2/2) [Solution]

Table format of second solution (cells marked with * are those that differ from the first solution):

(1)	**Ø-**	(8)	**vowels**
(2)*	**w-**	(9)*	**w**
(3)	**a-**	(10)*	**o**
(4)	**ba-**	(11)*	**consonant**
(5)	**vowels**	(12)*	**1**
(6)	**the first one**	(13)*	**3**
(7)	**b**	(14)	**2**

A2. The completed table is:

Imperative	***2nd singular***	***3rd singular***	***3rd plural***	***English***
bakisa	(1) **oakisa**	(2) **aakisa**	(3) **baakisa**	‘add’
(4) **anda**	wanda	(5) **anda**	(6) **banda**	‘begin’
solola	(7) **osolola**	(8) **asolola**	basolola	‘chat’
ponama	(9) **oponama**	aponama	(10) **baponama**	‘elect’
(11) **bowa**	oowa	(12) **aowa**	(13) **baowa**	‘cure’
(14) **balusa**	(15) **oalusa**	aalusa	(16) **baalusa**	‘turn’
loŋga	(17) **oloŋga**	(18) **aloŋga**	(19) **baloŋga**	‘win’



(B) A Cat in a Hat (1/1) [Solution]

B1.

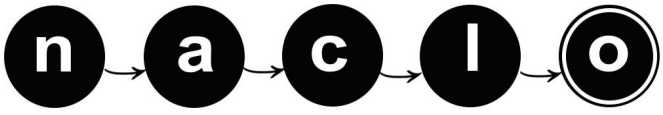
1. g	2. l	3. i	4. m
5. c	6. o	7. k	8. d
9. n	10. a	11. p	12. b
13. h	14. e	15. f	16. j

B2.

a. topibeʔ menwa yuŋno
b. joge wanɨŋ 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) [Solution]

C1.

1. H	2. Q	3. B	4. R
5. E	6. Y	7. L	8. I
9. T	10. U	11. F	12. D
13. P	14. S	15. J	16. G
17. V	18. O	19. M	20. W
21. J	22. N	23. A	24. K
25. X	26. C		

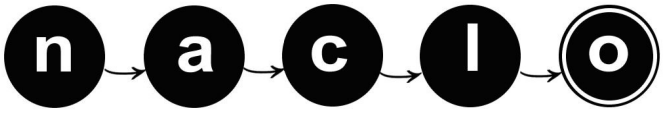
(D) Pay Attention (1/1) [Solution]

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 Numerals (1/1) [Solution]

E1.

a. pevar-ugent ÷ pemp = **c'hwezek** (80 ÷ 5 = 16)

b. pemp ha hanter kant − daouzek = **tri ha daou-ugent** (55 − 12 = 43)

c. nav warn ugent + **pevarzek** = tri ha daou-ugent (29 + 14 = 43)

d. kant ÷ **ugent** = 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.

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(F) Coming into Focus (1/1) [Solution]

F1.

a. sitarang nua uqałay 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 uqałay i tua gadu?

c. I anger your dog in **my field**.
inu a sutjalawan tua kuvatu?

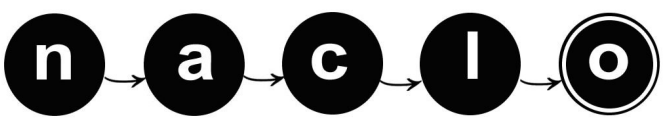
(G) Password Confusion (1/1) [Solution]

G1.

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

G2.

Text message	Distractor password	Larry's password guess	Harry's password guess	Correct password
Denmark's emptiest factory is exporting some pasta Russia is cooking each Saturday.	DEFIES PRICES	**DEFIES PRINCES**	**DEFINES PRICES**	**DEFINES PRICES**
Unions Nepal is forbidding over recent major events during breakfast are keeping exceptional records.	UNIFORMED BAKER	**UNIFORMED BANKER**	**UNINFORMED BAKER**	**UNIFORMED BANKER**



(H) The Idalion Tablet (1/1) [Solution]

H1.

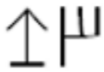
helei

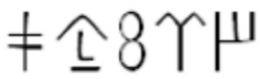
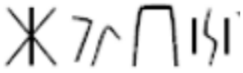
athanas

katethiyan

dowenai

H2. (Only the Cypriot script answers were required/graded.)

(a) "and" **kas** 

(b) "king" **basileus** 

(c) "instructed" **anōgon**