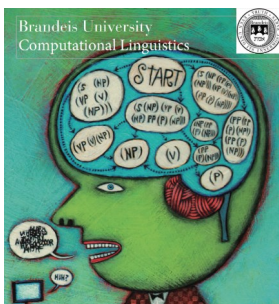


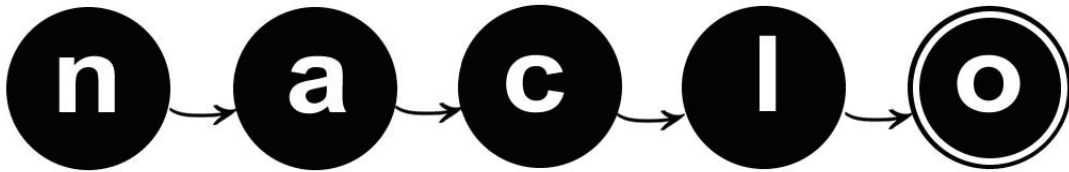
***The Eleventh
Annual
North American
Computational
Linguistics
Olympiad
2017***
www.nacloweb.org



**Invitational
Round
March 9, 2017**

Serious language puzzles that are surprisingly fun!

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



Welcome to the eleventh annual North American Computational Linguistics Olympiad! You are among the few, the brave, and the brilliant to participate in this unique event. In order to be completely fair to all participants across North America, we need you to read, understand, and follow these rules completely.

Rules

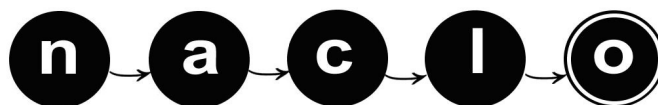
1. The contest is four hours long and includes ten problems, labeled I to R.
2. Follow the facilitators' instructions carefully.
3. If you want clarification on any of the problems, talk to a facilitator. The facilitator will consult with the jury before answering.
4. You may not discuss the problems with anyone except as described in items 3 & 11.
5. Each problem is worth a specified number of points, with a total of 100 points.
In the Invitational Round, some questions require explanations. Please read the wording of the questions carefully.
6. All your answers should be in the Answer Sheets at the end of this booklet. **ONLY THE ANSWER SHEETS WILL BE GRADED.**
7. Write your name and registration number on each page of the Answer Sheets'
Here is an example: Jessica Sawyer #850
8. The top students from each country (USA and Canada) will be invited to the next round, which involves online practices before the international competition in Ireland.
9. Each problem has been thoroughly checked by linguists and computer scientists as well as students like you for clarity, accuracy, and solvability. Some problems are more difficult than others, but all can be solved using ordinary reasoning and some basic analytic skills. You don't need to know anything about linguistics or about these languages in order to solve them.
10. If we have done our job well, very few people will solve all these problems completely in the time allotted. So, don't be discouraged if you don't finish everything.
11. **DO NOT DISCUSS THE PROBLEMS UNTIL THEY HAVE BEEN POSTED ONLINE! THIS MAY BE A COUPLE OF MONTHS AFTER THE END OF THE CONTEST.**

Oh, and have fun!

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NACLO 2017

Sites



As well as more than 120 high schools throughout the USA and Canada

(I) Basque Tasque (1/2) [10 points]

Basque is the language spoken by approximately 700,000 Basques inhabiting a region along the Pyrenees on the border of northern Spain and southwestern France. Below are some sentences in Basque along with their unmatched translations into well-formed English.

	<i>Basque</i>		<i>English</i>
a.	Nire anaiarekin bizi da.	(A)	We'll go home.
b.	Neskaren kotxea nahi dut.	(B)	I eat pasta with wine.
c.	Jantziko naiz eta joango gara.	(C)	My father lives in California.
d.	Umea kalean erori da.	(D)	The woman has read the book.
e.	Nire aitak erantzuna daki.	(E)	He lives with my brother.
f.	Ardoa bukatu duzu?	(F)	I don't know.
g.	Nire aita Californian bizi da.	(G)	My son has bought a new car.
h.	Etxera joango gara.	(H)	I'll get dressed and we'll go.
i.	Nire semeak kotxe berria erosi du.	(I)	The Atlantic is not a forest.
j.	Ez dakit.	(J)	I want the girl's car.
k.	Emakumeak liburua irakurri du.	(K)	Have you finished the wine?
l.	Atlantikoa ez da basoa.	(L)	My father knows the answer.
m.	Ardoarekin pasta jaten dut.	(M)	The child has fallen in the street.

Answer the following questions in the Answer Sheets.

I1. Match the correct English translation to the sentences in Basque.

I2. Translate the following Basque sentences into English.

- Neskak problema daki.
- Emakumearen etxea Europan da.
- Nire aitaren liburu berria irakuri dut.
- Aitarekin hotelera joango naiz.



(I) Basque Tasque (2/2)

I3. Translate the following English sentences into Basque using the additional Basque words below as needed.

<i>Basque</i>	<i>English</i>
zuri	white
Inglattera	England
familia	family

- a. I want white wine.
- b. The white wine is new.
- c. My father's son lives in England.
- d. My family has bought a new house.

I4. Explain your answer.



(J) The Norwegian Problem / A Norwegian Problem / Norwegian Problems / The Norwegian Problems? (1/2) [5 points]

Norwegian is a Germanic language spoken by over 5 million people; it is one of the official languages of Norway. Below are some Norwegian sentences and their English translations mixed up.

a.	Bussen stanser her.	(A)	A woman has the apple.
b.	Jeg har en bil.	(B)	I have an apple.
c.	Bilen stanser her.	(C)	The bus stops here.
d.	Jeg har eplet.	(D)	The woman has cars.
e.	Jeg har et eple.	(E)	The car stops here.
f.	En kvinne har eplet.	(F)	I have buses.
g.	Kvinna har biler.	(G)	The woman has the cars.
h.	Kvinna har bilene.	(H)	I have the apple.
i.	Jeg har busser.	(I)	The women stop here.
j.	Kvinnene stanser her.	(J)	I have a car.

Answer the following questions in the Answer Sheets.

J1. Match the correct English translation to its Norwegian counterpart.

J2. Nouns in Norwegian can belong to one of three classes: Common (masculine-feminine), Feminine, or Neuter. The class determines how the noun can be used with determiners (words such as “the”, “a”, “an”) and be made plural. The nouns you encountered above are all regular and feature examples of all three classes:

<i>Norwegian noun</i>	<i>Class</i>
kvinne	Feminine
bil	Common
eple	Neuter

Here are some more regular Norwegian nouns and their translations:

<i>Norwegian noun</i>	<i>Class</i>	<i>English Translation</i>
jente	Feminine	girl
hund	Common	dog
hotell	Neuter	hotel



(J) The Norwegian Problem / A Norwegian Problem / Norwegian Problems / The Norwegian Problems? (2/2)

Now, translate the following into Norwegian:

- a. The girl stops here.
- b. A girl has a hotel.
- c. I have the dogs.
- d. The girl has dogs.

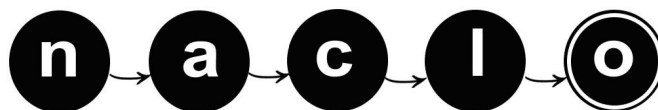
J3. Here is a little more Norwegian vocabulary without any information about the classes the slightly irregular nouns belong to.

<i>Norwegian word</i>	<i>English translation</i>
sko	shoe
mann	man
ikke	not

With what you have learned about Norwegian nouns, translate the following sentences from Norwegian into English:

- a. Mennene har epler.
- b. Kvinna har ikke skoene.
- c. Jeg har ikke eplene.

J4. Explain your answer.



(K) Sentences that go on and on and on and on (1/2) [10 points]

Sometimes a sentence can be made longer by adding words in a regular way. In some cases a consistent pattern of several words can be added (“climbing up a tree” and “growing on a planet” use different words, but have the same word types):

I saw a cat.

I saw a cat climbing up a tree.

I saw a cat climbing up a tree growing on a planet.

I saw a cat climbing up a tree growing on a planet orbiting around the sun.

I live in the house.

I live in the house on the hill.

I live in the house on the hill in the city.

I live in the house on the hill in the city on the border.

Answer the following questions in the Answer Sheets.

K1. First, write down the word types that form each pattern, using Adjective, Verb, Noun, Preposition, and Article (a table of words and types is included at the end of the problem):

a. I saw a cat climbing up a tree growing on a planet orbiting around the sun.

b. I live in the house on the hill in the city on the border.

Now, for each case, write a fifth line that follows the pattern. You may use words not shown in the table below, but the words you use should follow the patterns you identified:

K2. A computer program was written to identify these patterns. It worked as follows:

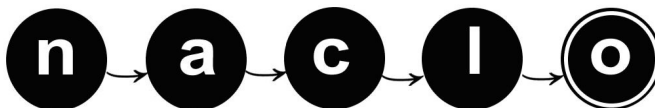
- Set current guess to None
- Check whether the last word’s type matches the second-last word’s type, if it does, change guess to the last word’s type
- Check whether the last pair of words’ types match the pair before them, if they do, change guess to the types of the last pair
- Check whether the last three words’ types match the three before them, if they do, change guess to the types of the last three words
- (and so on until the first half of the sentence and second half of the sentence are being compared)
- Return the current guess

If each time K words are compared it takes K steps, how many steps will it take to run the program on this example: *I run and jump and twirl.*

K3. For the two examples below, would the computer find the right pattern? If so, write ‘yes’, if not, write ‘no’ and what pattern (Verb, Noun, etc.), it would return instead.

a. I saw a cat climbing up a tree growing on a planet orbiting around the sun.

b. I live in the house on the hill in the city on the border.



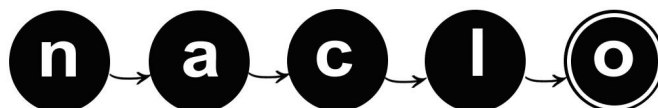
(K) Sentences that go on and on and on and on (2/2)

K4. Some sentence patterns can go on and on and on, but the computer program above will never be able to find a repeating sequence in them, no matter how long the sentences go. Give an example of such a sentence pattern.

Word Types

All the words used in the examples above can be found in the lists of word types below. In the first question you may use words in your example that are not shown here.

<i>Noun</i>	<i>Verb</i>	<i>Preposition</i>	<i>Adjective</i>	<i>Article</i>	<i>Conjunction</i>
border	climbing	around	blue	a	and
cat	growing	in	nice	the	
city	have	on	waterproof		
hat	jump	up			
hill	live				
house	orbiting				
I	run				
planet	saw				
sun	twirl				
tree					



(L) The Goat, the Mother, and the Wardrobe (1/1) [15 points]

Abkhaz is a Caucasian language predominantly spoken by around 100,000 people in the disputed territory of Abkhazia, and by a few thousand people in Turkey, Georgia, Syria, Russia, and Jordan. Among other things, it is known for having an extraordinary number of consonants (58 in the literary dialect). Here are some Abkhaz sentences in simplified transcription and their corresponding English translations. Notes: The cherkeska is an item of traditional Caucasian clothing, a single breasted collarless coat. A billy-goat is a male goat; a nanny-goat is a female goat. h^w, f^w, p['], ch^w, k^w, j, k^{'w}, ʒ^w, k', c', tɕ', x, and ɸ are consonants. ə is a vowel.

Abkhaz	English
Anch ^w a apərah ^w a aʃ ^w up'.	The god is wearing the apron.
Anch ^w a ajk ^w a rəʃop'.	The mothers are wearing the trousers.
Aeʃ axəlpə aʃ ^w up'.	The squirrel is wearing the hat.
Axəlpə bʃ ^w up'.	You (sg) are wearing the hat.
Ajmsək ^w a ʃ ^w əʃop'.	You (pl) are wearing the felt boots.
An ak ^{'w} əmʒ ^w ə ʃ ^w up'.	The mother is wearing the cherkeska.
Ajmaak ^w a haʃop'.	We are wearing the shoes.
Ak'asə ʃ ^w up'.	I am wearing the shawl.
Atah ^w madach ^w a ac'atɕ'k ^w a rʃ ^w up'.	The old men are wearing the coats.
Abach ^w a ak ^{'w} əmʒ ^w ək ^w a rʃ ^w up'.	The sons are wearing the cherkeskas.
Adzɸab ajmsək ^w a ləʃop'.	The girl is wearing the felt boots.
Ab ajk ^w a aʃop'.	The billy-goat is wearing the trousers.
Atah ^w mada apərah ^w a ʃ ^w up'.	The old man is wearing the apron.
Abk ^w a ak ^{'w} əmʒ ^w ək ^w a rʃ ^w up'.	The billy-goats are wearing the cherkeskas.
Aeʃk ^w a ak'asək ^w a rʃ ^w up'.	The squirrels are wearing the shawls.

Answer these questions in the Answer Sheets.

L1. Translate the following sentences into English:

- Adzɸabch^wa ajmaak^wa rəʃop'.
- Aba ajk^wa ʃop'.
- Ak'asək^wa ʃ^wup'.

L2. Translate the following sentences into Abkhaz:

- You (sg) are wearing the cherkeska.
- The nanny-goat is wearing the shawl.
- The gods are wearing the felt boots.

L3. Explain your answer.



(M) It will be you who solves this problem! (1/1) [5 points]

Māori is an Austronesian language spoken in New Zealand by 150,000 people. Here are some sentences in Māori and their English translations. Emphatic phrases in English are pronounced with extra stress. A sentence like 'Bob (emphatic) drank the water' means the same as 'It was Bob who drank the water.'

<i>Māori</i>	<i>English</i>
Ka moe au ki tātahi.	I will sleep at the beach.
Kua kite rātou i Te Maioro Nui Whakaharahara o Haina.	They have seen the Great Wall of China.
Ka patu koe i te pōro.	You will hit the ball.
Kua haere au ki te hui.	I have gone to the meeting.
I patua te taramu e te tama.	The drum was hit by the boy.
Kāore au e haere ki te marae.	I will not go to the courtyard.
I korerotia ngā kupu e te tama.	The words were spoken by the boy.
Kāore te whare i hangaia e Bob.	The house was not built by Bob.
I patu Bob i te taramu.	Bob hit the drum.
Kua mahia te mahi e au.	The work has been done by me.
I whāia au e te pūru.	I was chased by the bull.
Nā te kōtiro te taramu i patu.	<u>The girl</u> (emphatic) hit the drum.
Mā te wahine ngā pereti e horoi.	<u>The woman</u> (emphatic) will wash the plates.

Answer these questions in the Answer Sheets.

M1. Translate into English.

- Ka haere rātou ki tātahi.
- Kua patu au i te pōro.
- I hangaia te whare e Bob.
- Nā te tama te kōtiro i kōrero.
- Mā te pūru ngā tama e whai.
- Kāore au i haere ki te marae.

M2. Translate into Māori.

- They have slept at the meeting.
- You will go to the Great Wall of China.
- I will not sleep at the beach.
- The bull has been washed by you.
- The boy (emphatic) did the work.
- The woman went to the house.

M3. Explain your answer.



(N) To Be Determined (1/2) [10 points]

Bulgarian is a Slavic language and, along with the closely related Macedonian language, has several characteristics that set it apart from all other Slavic languages. Old Bulgarian was a highly synthetic language; synthetic languages express meaning by building complex words from smaller pieces. Modern day Bulgarian is a typical analytic language, one which expresses meaning more with word order, like English. Bulgarian currently uses the Cyrillic script, created after the older Glagolitic alphabets. In this problem, a Roman transliteration is used. The letter 'ǎ' represents the vowel in the English word *but*.

Here are some sentences given in Bulgarian and the translated equivalents (in no particular order) in English.

<i>Bulgarian</i>		<i>English</i>	
a.	Veshterǎt nahrani maymunata.	(A)	Your son watched you.
b.	Kamilata vǎrvya.	(B)	The girl hugged the cat.
c.	Momicheto pregǎrna kotkata.	(C)	You dressed yourself.
d.	Veshtitsata prokle kotkata.	(D)	The cat scratched you.
e.	Kotkata prokle tvoya sin.	(E)	You fed the son.
f.	Ti nahrani sina.	(F)	The witch cursed the cat.
g.	Kotkata te odraska.	(G)	The camel walked.
h.	Ti skochi.	(H)	The cat cursed your son.
i.	Tvoyat sin te gleda.	(I)	The wizard fed the monkey.
j.	Veshterǎt pregǎrna edna kamila.	(J)	The son dressed your baby.
k.	Ti se obleche.	(K)	You jumped.
l.	Sinǎt obleche tvoeto bebe.	(L)	The wizard hugged a camel.

Answer these questions in the Answer Sheets.

N1. Match the Bulgarian sentences with their corresponding English translations.

N2. Translate the following sentences into English:

- Maymunata gleda tvoyata veshtitsa.
- Tvoyata kamila obleche edno momiche.
- Veshterǎt se prokle.
- Ti pregǎrna bebeto.
- Ti vǎrvya.
- Ti prokle edin veshter.



(N) To Be Determined (2/2)

N3. Translate the following sentences into Bulgarian:

- a. The witch dressed you.
- b. The baby watched the girl.
- c. The monkey jumped.
- d. You hugged a son.
- e. Your son dressed a baby.

N4. Explain your answer.



(O) Common Sense (1/1) [10 points]

In English, we may find pairs of sentences that are minimally different, but in which the pronouns (words like “he”, “she”, or “it”) refer back to completely different *antecedents* (where a pronoun’s antecedent is the word or phrase that the pronoun refers to). For example, consider the following sentences:

James scolded Caleb because he stole the diamonds. James scolded Caleb because he was angry.

In these two sentences, the pronoun “he” refers to two different antecedents: “James” and “Caleb”. Figuring out whether the pronoun refers to James or Caleb relies on common sense and world knowledge – those who steal diamonds should be scolded, and those doing the scolding are usually angry. This knowledge is something that humans have, but computers don’t, making pronoun disambiguation difficult.

In the alternate universe of Terra, where people speak a language similar to English but with variants of many words, 6 rather clumsy sisters (named Barnard, Holyoke, Radcliffe, Smith, Vassar, and Wellesley) are all going to a party.* They each own exactly one of the following types of items: a lapsine, a ricktick, a plumbus, or a riplin.

The following ensued (these sentences are in no particular order):

- (1) Smith catabulled Vassar because she elamped her plumbus.
- (2) Barnard elamped Radcliffe’s lapsine because she was not molistic, so Radcliffe catabulled Barnard.
- (3) Holyoke did not stipe because Vassar’s riplin elamped and Holyoke could not mirt there.
- (4) Smith stiped ravint Wellesley even though her plumbus elamped.
- (5) Barnard’s ricktick did not schleem Radcliffe’s lapsine because it was too efrimious.
- (6) Radcliffe un-elamped her lapsine and stiped bevint everyone else who stiped.
- (7) Vassar catabulled Holyoke because she elamped the plumbus (which happened at about the same time as when Holyoke elamped Vassar’s riplin.)
- (8) Radcliffe’s lapsine did not schleem Holyoke’s riplin because it was too un-efrimious.
- (9) Vassar stiped ravint Radcliffe because she had a riplin with her.
- (10) Vassar (using Holyoke’s riplin) stiped bevint Smith.
- (11) Wellesley stiped bevint Vassar, with her lapsine and Barnard’s ricktick because it schleemed it and no other item.
- (12) Barnard - one of four lanterers who mirted there - stiped ravint everyone else.

Answer these questions in the Answer Sheets.

O1. Knowing that Barnard’s ricktick is more efrimious than Radcliffe’s lapsine, identify the antecedent to each of the underlined pronouns.

O2. Given that only one lanter schleems each riplin, list everyone who got to the party in the order that they arrived.

*They have a seventh sister named Bryn Mawr, but she does not factor into this problem.



(P) Do you see what I see? (1/1) [10 points]

Proto-Algonquian was spoken about 3000 years ago by the ancestors of the current speakers of the various Algonquian languages, which are spoken in Canada and the USA. The ‘:’ in the data below indicates a long vowel. The ‘θ’ indicates a ‘th’ sound, as in ‘thing’. (sg) is short for *singular* and (pl) is short for *plural*; *you (pl)* could be translated as *y’all*. (excl) is short for *exclusive*; *we (excl)* refers to a group of people including the speaker and someone else, but not the listener.

The Proto-Algonquian words below can be translated as entire sentences in English. Consider the following sentences constructed using the verb *wapam* ‘to see’. (Simplified data)

Proto-Algonquian	English
kewa:pameθehm	‘I see you (sg)’
kewa:pameθehmwa:	‘I see you (pl)’
newa:pama:ehma	‘I see him/her’
newa:pama:ehmaki	‘I see them’
kewa:pameθehmwa:ena:n	‘we see you (pl)’
newa:pama:ehmena:na	‘we see him/her’
kewa:pamiehm	‘you (sg) see me’
kewa:pama:ehm	‘you (sg) see her/him’
kewa:pamiehmwa:	‘you (pl) see me’
kewa:pamiehmwa:ena:n	‘you (pl) see us (excl)’
newa:pamekwehmena:naki	‘they see us’

Answer these questions in the Answer Sheets.

P1. Translate the following Proto-Algonquian sentences into English, and English sentences into Proto-Algonquian.

- kewa:pamiehmena:n
- ‘we see them’
- ‘they see me’

P2. Give translations of the following morphemes (suffixes or prefixes) of Proto-Algonquian:

- ne-
- wa:
- eθ
- i
- ehm
- aki

P3. Explain your answer.



(Q) Pluses and Minuses (1/1) [15 points]

The Khakas language is a Siberian Turkic language that is spoken by about 52,000 people in the southern Siberian autonomous Russian republics of Khakassia and Tuva. It is normally written in Cyrillic, but has been transliterated here.

The unfamiliar symbols are pronounced roughly as follows:

- č is like the ch in 'church' (IPA [tʃ])
- ğ is like the ch in 'loch' or German 'Bach', but voiced, as in Dutch (IPA [ɣ])
- ŋ is like the ng in 'sing'
- y is like the vowel in 'see'
- ȳ is like the French vowel 'u' or German 'ü', pronounced like 'ee' but with the lips rounded
- u is a vowel pronounced like 'urgh', like 'oo' but with the lips spread
- ö is somewhat like the first vowel in 'colonel' (IPA [ø])

Answer these questions in the Answer Sheets.

Q1. Given are arithmetic equations in the Khakas language written in transliteration. All numbers are given as fractions in which no numerator or denominator is greater than 20, and no denominator is equal to 1. All the numbers are positive. Rewrite the equations using numbers.

- sygizniŋ piri + iki sygistig = sygizniŋ ȳzi
- čyti ȳstig + altunwŋ piri = iki pȳdin pir ikilig
- iki toğwstuwğ + toğwznwŋ piri = iki altwulwğ
- pys pystig + čytiniŋ piri = pir pȳdin pir čytilig
- čytiniŋ ikizi + iki pystig = 24/35
- altunwŋ ikizi + toğwznwŋ piri = sygis on sygistig
- pir törttig – ȳs čybirgilig = pir onnwğ

Q2. Write the following numbers in Khakas:

- 4
- 15
- 23

Q3. What is the meaning of the Khakas word pȳdin?

Q4. Explain your answer.



(R) Text-o-matic (1/2) [10 points]

One day, while looking through a storage closet in the linguistics building at her university, Ada discovers a dusty machine labelled the Text-o-matic 1000. She switches it on, and sees the following on the screen:

```
< → <CAN
```

Intrigued, she types in her name, and presses enter. The machine whirrs and prints a small slip of paper that reads:

```
ADA // CANADA
```

She fiddles with the machine and gets the screen to read:

```
D → LBERT
```

Again, she types in her name and presses enter, and this time the machine prints:

```
ADA // ALBERTA
```

Finally, she notices a note taped to the top of the machine, which reads:

Important!

1. *Text-o-matic 1000 applies rules in descending order.*
2. *If Text-o-matic 1000 cannot apply a rule, it skips to the next one.*
3. *Before applying the first rule, the Text-o-matic 1000 adds < at the beginning and > at the end of the input word, and it removes them right before printing. If any rule deletes these symbols, the machine will crash!*

Ada decides to use the Text-o-matic 1000 to convert the first twenty cardinal French numbers into their ordinal equivalents. In other words, she wants to find a set of rules so that when any of the first twenty numbers is entered (in written form), the machine prints the corresponding output shown below.

UN // PREMIER	ONZE // ONZIÈME
DEUX // DEUXIÈME	DOUZE // DOUZIÈME
TROIS // TROISIÈME	TREIZE // TREIZIÈME
QUATRE // QUATRIÈME	QUATORZE // QUATORZIÈME
CINQ // CINQUIÈME	QUINZE // QUINZIÈME
SIX // SIXIÈME	SEIZE // SEIZIÈME
SEPT // SEPTIÈME	DIX-SEPT // DIX-SEPTIÈME
HUIT // HUITIÈME	DIX-HUIT // DIX-HUITIÈME
NEUF // NEUVIÈME	DIX-NEUF // DIX-NEUVIÈME
DIX // DIXIÈME	VINGT // VINGTIÈME



(R) Text-o-matic (2/2)

Answer these questions in the Answer Sheets.

R1. Fill in the blanks (one character per blank) to create a set of rules that accomplish Ada's task. Be sure to also fill out the Answer Sheets.

- a. ___ ___ → ___
- b. ___ ___ → ___ ___ ___
- c. ___ → ___
- d. ___ → ___ ___ ___ ___ ___
- e. ___ ___ ___ ___ ___ ___ → ___ ___ ___ ___ ___ ___

R2. Ada tries to use the new set of rules to do the same task for all cardinal numbers below 100, but finds the following two errors:

```
VINGT-ET-UN // VINGT-ET-PREMIER
QUATRE-VINGTS // QUATRE-VINGTSIÈME
```

Describe how you could modify the rules above so the outputs are:

```
VINGT-ET-UN // VINGT-ET-UNIÈME
QUATRE-VINGTS // QUATRE-VINGTIÈME
```

Try to make as few and as minor modifications as you can to fix the problem, while still printing the correct outputs for the first twenty cardinal numbers.

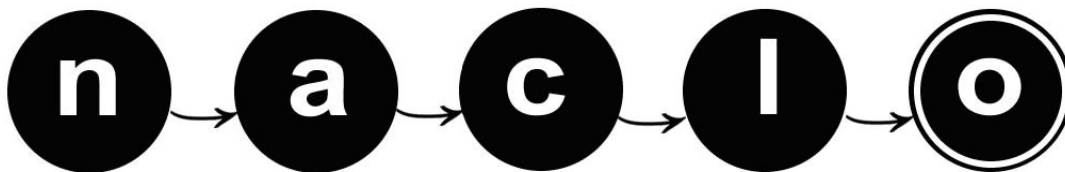
R3. You have been hired to program the Text-o-matic 2000, which will be able to work in both directions, either producing ordinal numbers from cardinal numbers or cardinal numbers from ordinal numbers.

However, it still only contains one set of rules. It produces cardinal numbers from ordinal numbers by "reversing" these rules, undoing each rule (that is, replacing the letters *after* the arrow with the letters *before* the arrow) going from the bottom rule to the top rule.

The rules you found above, however, won't work in the new Text-o-matic 2000. For example, instead of producing `SIX` from `SIXIÈME`, they produce `SIXE`!

Find a set of rules that works in both directions, producing the ordinal numbers from the cardinal numbers when run in the normal direction, and producing the cardinal numbers from the ordinal numbers when "undone" in the reverse direction. Remember to handle the special cases for `VINGT-ET-UN` and `QUATRE-VINGTS`!





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Contest Booklet

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Name: _____

Contest Site: _____

Site ID: _____

City, State: _____

Grade: _____

Start Time: _____

End Time: _____

Please also make sure to **write your registration number and your name on each page** that you turn in.

SIGN YOUR NAME BELOW TO CONFIRM THAT YOU WILL NOT DISCUSS THESE PROBLEMS WITH ANYONE UNTIL THEY HAVE BEEN OFFICIALLY POSTED ON THE NACLO WEBSITE IN APRIL.

Signature: _____

YOUR NAME:

REGISTRATION #

Answer Sheet (1/9)

(I) Basque Tasque

- I1. a. b. c. d. e. f. g. h.
i. j. k. l. m.

- I2. a.
b.
c.
d.

- I3. a.
b.
c.
d.

- I4.

(J) The Norwegian Problem / A Norwegian Problem / Norwegian Problems / The Norwegian Problems?

- J1. a. b. c. d. e. f. g. h.
i. j.



YOUR NAME:

REGISTRATION #

Answer Sheet (2/9)

(J) The Norwegian Problem / A Norwegian Problem / Norwegian Problems / The Norwegian Problems?
(cont.)

J2. a.

b.

c.

d.

J3. a.

b.

c.

J4.

(K) Sentences that go on and on and on and on

K1. a.

b.

K2.



YOUR NAME:

REGISTRATION #

Answer Sheet (3/9)

(K) Sentences that go on and on and on and on (cont.)

K3. a.

b.

K4.

(L) The Goat, the Mother, and the Wardrobe

L1. a.

b.

c.

L2. a.

b.

c.

L3.



YOUR NAME:

REGISTRATION #

Answer Sheet (4/9)

(M) It will be you who solves this problem!

M1. a.

b.

c.

d.

e.

f.

M2. a.

b.

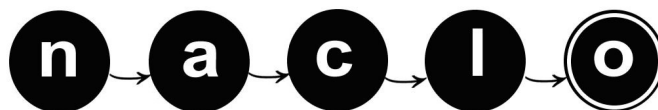
c.

d.

e.

f.

M3.



YOUR NAME:

REGISTRATION #

Answer Sheet (5/9)

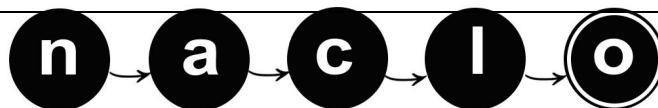
(N) To Be Determined

N1. a. b. c. d. e. f. g. h.
i. j. k. l.

N2. a.
b.
c.
d.
e.
f.

N3. a.
b.
c.
d.
e.

N4.



YOUR NAME:

REGISTRATION #

Answer Sheet (6/9)

(O) Common Sense

O1. (1) she (1) her (4) her (5) it
(7) she (9) she (11) her
(11) it (first) (11) it (second)

O2.

(P) Do you see what I see?

P1. a.
b.
c.

P2. a.
b.
c.
d.
e.
f.



YOUR NAME:

REGISTRATION #

Answer Sheet (7/9)

(P) Do you see what I see? (cont.)

P3.

(Q) Pluses and Minuses

Q1. a.

b.

c.

d.

e.

f.

g.



YOUR NAME:

REGISTRATION #

Answer Sheet (8/9)

(Q) Pluses and Minuses (cont.)

Q2. a.

b.

c.

Q3.

Q4.

(R) Text-o-matic

R1. a. →

b. →

c. →

d. →

e. →



YOUR NAME:

REGISTRATION #

Answer Sheet (9/9)

(R) Text-o-matic (cont.)

R2.

R3.



YOUR NAME:

REGISTRATION #

Extra Page (1/2)



YOUR NAME:

REGISTRATION #

Extra Page (2/2)

