



HCSNet

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OzCLO

# First Australian Computational and Linguistics Olympiad

## STATE ROUND

# Problem set (2 hours)

YOU ARE ONLY ALLOWED TO WORK ON THE PROBLEM SET IN TWO HOURS.  
RETURN IT TO THE FACILITATOR AT THE END OF THE CONTEST TIME.

# (A) Lalana Chinantec

Lalana Chinantec is a language spoken by approximately 10,000 people who live in the Oaxaca region of Mexico. In the following orthography a colon (: ) marks a long vowel, and the ? symbol marks a glottal stop (like the sound in the middle of *uh-oh*).

kalakwa: kwi: li:?	The beautiful corn grew.
miładźö mo:h kya	My pineapples have turned out well.
li: ? kalane kwi: kwa: kya	My tall corn yellowed beautifully.
đźö kalaro:h mo:h ne kya	My yellow pineapples ripened well.
kaladźö kwi:	The corn turned out well.
miłakwa: kwi:	The corn has grown.

**A1.** What does the word li:? mean?

**A2.** What does the word ro:h mean?

**A3.** Translate the following sentences into Lalana Chinantec:

(i) The good pineapples became beautiful.

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(ii) My ripe corn has yellowed well.

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**A4.** Translate the following sentences into English:

(i) miłaro:h kwi: ne

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(ii) li:? kalakwa: kwi:

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# (B) Luiseño

Luiseño is a highly endangered language of southern California that is a member of the Uto-Aztec language family. While it has an ethnic population of around 2,000, Luiseño is only spoken by 30 to 40 people.

An asterisk (\*) at the beginning of a sentence indicates that it is not grammatical.

In the following orthography  $\mathfrak{s}$  represents a retroflexed ‘s’ sound, which is made with the tongue further back in the mouth;  $\mathfrak{c}$  represents the ‘ch’ sound, as in *chin*; and  $\mathfrak{?}$  marks a glottal stop, which is like the sound in the middle of *uh-oh*.

- |   |                                  |
|---|----------------------------------|
| 1. hengeemal naqmaq                                       | The boy is listening.            |
| 2. nawitmal maamayuc                                      | The girl is helping.             |
| 3. $\mathfrak{?}$ awaalum wa $\mathfrak{?}$ iwun          | The dogs are barking.            |
| 4. hengeemalum naqmawun                                   | The boys are listening.          |
| 5. hunwut xaariq  | The bear is growling.            |
| 6. wunaal naqmaq  | S/he is listening.               |
| 7. $\mathfrak{?}$ awaalum xaariwun                        | The dogs are growling.           |
| 8. paa $\mathfrak{?}$ ila heyiq                           | The turtle is digging.           |
| 9. paa $\mathfrak{?}$ ilam heyiwun                        | The turtles are digging.         |
| 10. hunwutum neqpiwun                                     | The bears are fighting.          |
| 11. muutam naqmawun                                       | The owls are listening.          |
| 12. muuta ka $\mathfrak{s}$ illay noonomiq                | The owl is following the lizard. |
| 13. $\mathfrak{?}$ awaal paa $\mathfrak{?}$ ilay neqpiq   | The dog is fighting the turtle.  |
| 14. hengeemal nawitmali $\mathfrak{c}$ aqalaqiq           | The boy is tickling the girl.    |
| 15. nawitmal hengeemali $\mathfrak{c}$ aqalaqiq           | The girl is tickling the boy.    |
| 16. ka $\mathfrak{s}$ illa $\mathfrak{?}$ awaali toowq    | The lizard sees the dog.         |
| 17. ka $\mathfrak{s}$ illam muutay kwa $\mathfrak{?}$ wun | The lizards are eating the owl.  |
| 18. wunaalum muutami moyooniwun                           | They are feeding the owls.       |
| 19. $\mathfrak{?}$ awaali ka $\mathfrak{s}$ illa toowq    | The lizard sees the dog.         |
| 20. ka $\mathfrak{s}$ illa toowq $\mathfrak{?}$ awaali    | The lizard sees the dog.         |
| 21. $\mathfrak{?}$ awaali toowq ka $\mathfrak{s}$ illa    | The lizard sees the dog.         |
| 22. * toowq ka $\mathfrak{s}$ illa $\mathfrak{?}$ awaali  |                                  |
| 23. * toowq $\mathfrak{?}$ awaali ka $\mathfrak{s}$ illa  |                                  |

**B1 Nouns in Luiseño**

- a. Fill in the spaces below with the correct forms:

bears \_\_\_\_\_

turtle \_\_\_\_\_

*muuta* \_\_\_\_\_

*kaşillam* \_\_\_\_\_

- b. What endings are used to mark nouns as plural?
- c. What would be the plural of *ʔahiiču* ‘orphan’?
- d. Briefly explain how you can predict which ending will occur with a particular noun.

**B2. More Endings in Luiseño**

- a. What does the ending *-q* mean?
- b. What does the ending *-wan* mean?
- c. What do the endings *-y* and *-i* mean?
- d. Briefly explain how you can predict whether *-y* or *-i* will occur.

**B3. Word Order in Luiseño**

- a. On the basis of these examples, what is the usual word order in Luiseño sentences?
- b. Luiseño also allows some freedom in word order. Briefly describe which variations in word order are acceptable and which are not.

**B4. Speaking Luiseño**

a. How would you say ‘The dog is eating the lizards’ in Luiseño?

b. Give two additional sentences in Luiseño that you predict will be grammatical.

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c. Give two more you predict will be ungrammatical.

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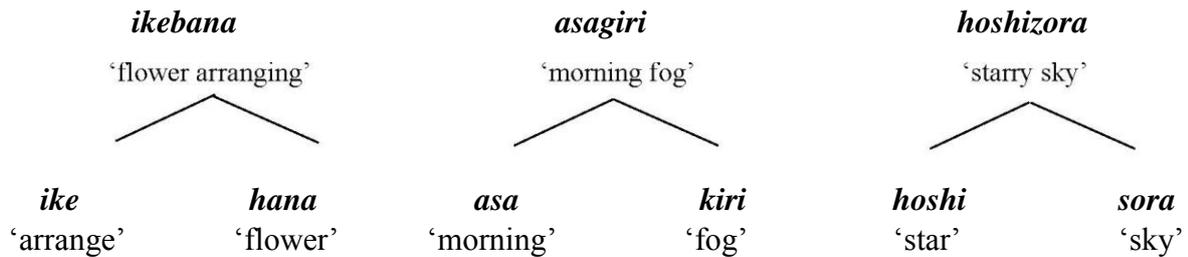
d. Briefly state why the ungrammatical ones are incorrect.

Problem created by Jean Mulder 2008

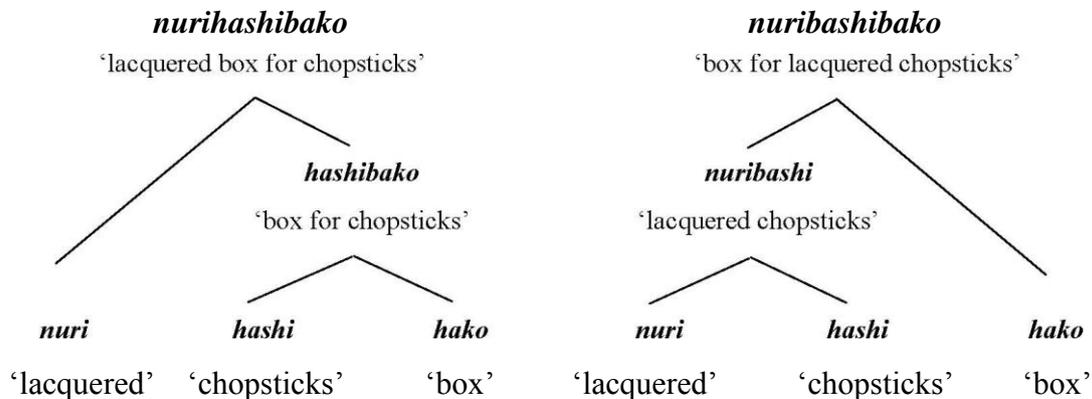
Data from Dryer, M. (1987) *Manual for Descriptive Language Analysis*,  
2nd edition. Edmonton: Linguistics Department, University of Alberta.

# (C) Fakepapershelfmaker

In English, we can combine two nouns to get a compound noun, such as in ‘mailbox’ or ‘sandcastle’. We can do this in Japanese as well, but just sticking the two words together isn’t enough. Instead, the words themselves undergo predictable changes:



Compound words can then be compounded again, creating compounds with three or more members. Study the diagrams below carefully. You’ll notice that the order in which the compound is built affects both the meaning and the final form of the word.



**C1.** The following is a list of several Japanese words with their English meanings. Use this word bank to write definitions of the Japanese compounds (a)-(f). Be very specific with how you phrase your definition. If your definition is ambiguous (has two meanings), it will not be counted.

<i>sakura</i>	cherry blossom	<i>kami</i>	paper	<i>nise</i>	fake
<i>shiru</i>	soup	<i>tana</i>	shelf	<i>tsukuri</i>	maker
<i>iro</i>	color(ed)	<i>tanuki</i>	raccoon	<i>hako</i>	box

(a) <i>nisetanukijiru</i>	
(b) <i>nisedanukijiru</i>	
(c) <i>irogamibako</i>	
(d) <i>irokamibako</i>	
(e) <i>nisezakuradana</i>	
(f) <i>nisesakuradana</i>	

**C2.** Match the following four-member Japanese compound words on the left with their English meanings on the right. (Some will require you to stretch your imagination a bit!) One of the Japanese words will correspond to two possible English meanings.

___ (1) a fake (fraudulent) shelfmaker made of paper	(A) <i>nisegamidanadzukuri</i>
___ (2) a maker of fake shelves for paper	(B) <i>nisekamitanadzukuri</i>
___ (3) a fake (fraudulent) maker of shelves for paper	(C) <i>nisegamitanadzukuri</i>
___ (4) a shelfmaker made of fake paper	(D) <i>nisekamidanadzukuri</i>
___ (5) a maker of shelves for fake paper	

**C3.** Explain your answers to C1 and C2 in the space provided below.

# (D)Thorny Stems

Wouldn't it be nice if your computer could understand English? In this problem, you will write down a small set of rules encoding one piece of your knowledge about English.

The problem you will approach is called “stemming.” You know that “work”, “working”, “works”, and “worked” are all forms of the same verb: “work”. Similarly, “guesses” and “guess” are both forms of the same noun: “guess”. Below you will find a list of pairs of a word and its stem, both nouns and verbs. Your goal is to write down a list of rules which is as short as possible, but covers all of the example pairs. You must also list exactly one exception for every rule which has one.

## *Example*

Rule 1: **If** a word ends in ss, **then** replace ss with ss to form the stem.

Rule 2: **If** a word ends in s, **then** replace s with   to form the stem.

Rule 3: **Otherwise** the word is its own stem.

Let's look at how these rules will apply to a few examples. We always use only the first numbered rule that applies. For the word “work”, Rules 1-2 do not apply, so we are left with Rule 3, “work” is its own stem. For the word “works”, Rule 1 does not apply, but Rule 2 does, so the stem of “works” is formed by replacing the final “s” with nothing - i.e. deleting it, to form “work”. Finally, for the word “grass”, Rule 1 does apply, and so we replace “ss” with “ss”, i.e. the word is unchanged and then we stop.

Your goal is to write one list of rules which will apply to both the nouns and the verbs listed on the next page.

## *Exceptions*

The rules you write will not always work. Any word for which your rules give the wrong stem is called an “exception”. You will write down exceptions for your rules - an exception is written next to the first rule whose “if” part applies to it. For example, “guess” is not an exception to the rules above, since even though Rule 2 does not handle it, Rule 1 (which comes first) does. However, “cries” is an exception (these rules gives its stem as “crie” instead of “cry”), and it should be written next to Rule 2 as follows:

**If** a word ends in ss, **then** replace ss with ss to form the stem. **Exception:** -none-

**If** a word ends in s, **then** replace s with   to form the stem. **Exception:** cries

***Judging***

Your score will be determined according to the following criteria:

You should have rules to cover all the words in the list below.

You should use as few rules as you can.

You should list an exception next to as many rules as you can.

***Words and stems***
**NOUNS**

<b>word</b>	<b>stem</b>
backs	back
books	book
chiefs	chief
companies	company
duties	duty
dwarves	dwarf
grass	grass
moss	moss
potatoes	potato
presidents	president
roses	rose
shelves	shelf
stores	store
stapler	stapler
times	time
toe	toe
tomatoes	tomato
wives	wife

**VERBS**

<b>word</b>	<b>stem</b>
cried	cry
cries	cry
dished	dish
flies	fly
married	marry
killed	kill
listened	listen
ordered	order
resorts	resort
sailing	sail
tailing	tail
tell	tell

**D1. Your rules**

You do not need to use all the blank rules below. Cross out any rules you do not use.

1. If a word ends in \_\_\_\_\_, then replace \_\_\_\_\_ with \_\_\_\_\_ to form the stem.  
Exception:
2. If a word ends in \_\_\_\_\_, then replace \_\_\_\_\_ with \_\_\_\_\_ to form the stem.  
Exception:
3. If a word ends in \_\_\_\_\_, then replace \_\_\_\_\_ with \_\_\_\_\_ to form the stem.  
Exception:
4. If a word ends in \_\_\_\_\_, then replace \_\_\_\_\_ with \_\_\_\_\_ to form the stem.  
Exception:
5. If a word ends in \_\_\_\_\_, then replace \_\_\_\_\_ with \_\_\_\_\_ to form the stem.  
Exception:
6. If a word ends in \_\_\_\_\_, then replace \_\_\_\_\_ with \_\_\_\_\_ to form the stem.  
Exception:
7. If a word ends in \_\_\_\_\_, then replace \_\_\_\_\_ with \_\_\_\_\_ to form the stem.  
Exception:
8. If a word ends in \_\_\_\_\_, then replace \_\_\_\_\_ with \_\_\_\_\_ to form the stem.  
Exception:
9. If a word ends in \_\_\_\_\_, then replace \_\_\_\_\_ with \_\_\_\_\_ to form the stem.  
Exception:
10. If a word ends in \_\_\_\_\_, then replace \_\_\_\_\_ with \_\_\_\_\_ to form the stem.  
Exception:
11. Otherwise the word is its own stem.

**D2. Explain your reasoning in the space below.**

# (E)The Curragh of Kildare

And straight I will repair  
 To the Curragh of Kildare  
 For it's there I'll find tidings of my dear  
 [Irish Folk Song]

In Ireland, each place name has two versions with equal legal status – an English one and an Irish one. Below are some place-names in their two versions and translations of the Irish ones.

	English	Irish	Translation of Irish name
1	Glenamuckaduff	Gleann na Muice Duibhe	Valley of the Black Pig
2	Clonamully	Cluain an Mhullaigh	Meadow of the Summit
3	Buncurry	Bun an Churraigh	Base of the Marsh
4	Curraghmore	An Currach Mór	The Big Marsh
5	Annaghanoon	Eanach an Uain	Fen of the Lamb
6	Dunard	An Dún Ard	The High Fort
7	Bunagortbaun	Bun an Ghoirt Bháin	Base of the White Field
8	Gortnakilly	Gort na Cille	Field of the Church
9	Binbane	An Bhinn Bhán	The White Peak
10	Ballyknock	Baile an Chnoic	Town of the Hill
11	Ballynaparka	Baile na Páirce	Town of the Park
12	Kilcarn	Cill an Chairn	Church of the Mound
13	Killeshil	An Choill Íseal	The Low Wood
14	Clashbane	An Chlais Bhán	The White Pit
15	Bunbeg	An Bun Beag	The Small Base

Sometimes the English name is no more than a translation of the Irish one:

16	Blackabbey	An Mhainistir Dhubh
17	Bigpark	An Pháirc Mhór
18	Castlepark	Páirc an Chaisleáin
19	Woodland	Talamh na Coille

**E1.** What would the Irish names of the following towns and villages be? Provide a translation for each one. If you think more than one Irish name could correspond to a given English name, give all of them:

	<b>English</b>	<b>Irish</b>	<b>Translation of Irish name</b>
20	Mullaghbane		
21	Killananny		
22	Knocknakillardy		
23	Gortnabinna		
24	Clashgortmore		
25	Killbeg		
26	Blackcastle		Black castle

**E2.** Explain your reasoning and provide any additional observations about this problem.