



OzCLO

Welcome to the Australian Computational and Linguistics Olympiad!

To be completely fair to all participants across Australia, we need you to read, understand and follow these rules.

RULES

1. Write your registration number on each page of the Answer Booklet.
2. The contest is two hours long.
3. Follow the facilitators' instructions carefully.
4. If you want clarification on any of the problems, talk to a facilitator.
5. You may not discuss the problems with anyone except your team members and the facilitator.
6. It's up to each team to decide how you want to solve the problems. You may decide to divide up the problems among your team members, or work on each problem together.
7. Each problem is worth a specified number of points, with a total of 100 points in the contest.
8. Only work in the **Answer Booklet** will be graded. All your answers should be in the spaces provided in the coloured paper Answer Booklet, not in the individual Contest Booklet. (Make sure you allow enough time to transfer your answers to the Answer Booklet.)
9. At the end of the Session, leave all booklets on your table to be collected by the facilitator.

The top 3 teams in each Round One competition will be invited to participate in the National Round.

Each problem has been thoroughly checked for clarity, accuracy and solvability. Some are more difficult than others, but all can be solved using ordinary reasoning and analytic skills. You don't need to know anything about linguistics or about these languages in order to solve the problems. If we have done our job well, almost no one will solve all problems completely in the time allotted. So don't be discouraged if you don't finish everything. *Oh! And have fun!*



OzCLO competition 2012

Round One

There are six problems (A-F) which you are asked to solve

Some problems have more than one part or question



A. Cat and Mouse Story (I/I)

[10 points]

“Okay, so my cat *pombed gwee the trowby*, and she *pombed gwee the foba*. She *pombed ippip the foba* and *pombed gorch the foba*, and eventually she *pombed ippip the trowby*.”

Your friend has apparently joined some strange new subculture and is trying out the slang. Either that or he hit his head. Whatever the cause, it looks like your friend has replaced the words *down, into, up, run, mouse, and street* with the words *gwee, ippip, trowby, foba, poble, and gorch*. You can't yet tell which is which, so you have this conversation:

You: So, it started off with the cat *pombling* the *trowby gwee*.

Him: That's nonsense; that's not even a good sentence.

You: Could I say “The cat *pombed* the *foba gwee*?”

Him: That's just as bad.

You: It *was gwee the foba* that the cat *pombed*, right?

Him: Correct.

You: Then the cat *pombed gorch the foba* and *ippip the foba*.

Him: Yes.

You: And the cat *pombed gorch the foba* and *ippip the trowby*?

Him: You're talking nonsense again.

You: But it was *ippip the trowby* that the cat *pombed*?

Him: You don't know how to use words, do you?

You: The cat *pombed* the *trowby ippip*.

Him: That sounds a lot better.

A-I What do the following words mean? Context clues are useful to give you hints, but to *prove* which words mean which, you should also use your friend's judgments about your attempted sentences.

ippip

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

foba

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poble

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gwee

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trowby

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gorch

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B. Learn Yolmo with pleasure (I/I)

[10 points]

Yolmo is a Tibeto-Burman language spoken in Nepal by around 10,000 people. The sentences below come from a small dialect spoken by around 500 people in the district of Lamjung. Below is a list of sentences in Lamjung Yolmo with their English translations. The ʈ and ɖ symbols represent retroflex consonants, pronounced (roughly) as “tr” and “dr”, respectively, by curling the tip of the tongue backwards in the mouth.

ngà ngàki làkpaki tó sake	I eat rice with my hand
ngà ʈángaki kwèla nyòke	I buy clothes with money
ngà ngàki khí nyímu ɖòke	I walk with my dog
ngà ngàki kéeki lú lènke	I sing a song with my voice
ngà ngàki áma nyímu kwèla nyòke	I buy clothes with my mother
ngà ngàki ádzi nyímu lú lènke	I sing a song with my sister
ngà ngàki kángbaki ɖòke	I walk with my legs

B-1 Two of the English sentences below would be translated into Yolmo by a sentence using the word *nyímu*. Mark these two sentences with X in the boxes to right of the sentence.

- | | |
|--|--------------------------|
| A. I eat rice with my spoon. | <input type="checkbox"/> |
| B. I talk with my mouth. | <input type="checkbox"/> |
| C. I walk with my bag. | <input type="checkbox"/> |
| D. I never travel with money (on me). | <input type="checkbox"/> |
| E. Since my accident I have to walk with my stick. | <input type="checkbox"/> |

B-2 How would you translate the phrase “with money” in sentence D above?

B-3 How would you translate the sentence, “I eat rice with my sister”?



C. Interstellar First Contact (1/3)

[25 points]

It's hard enough to translate between languages when you understand both languages. It's harder still when you only understand one. But what do computers do? They don't truly understand either language. To illustrate the challenge that computers face, Kevin Knight posed this classic puzzle (Knight 1997): given two equivalent texts in two unknown alien languages, how would you go about translating one to another?

It is the year 2354 AD. Our scientists have been eavesdropping on messages between two alien civilizations for a very long time, but we have never met either. The closest aliens, the Centauri, have finally begun to communicate with us. Their first message was a message of peace:

“Farok crrok hihok yorok klok kantok ok-yurp.”

Now, we know that the Centauri have been in contact for some time with the Arcturan race, who live in another solar system. We have never had contact with the Arcturans, but newly developed technology makes it possible for us to send them a message. We would like to send them, first, a message of peace, but because we do not understand their language, this is not an easy task.

Luckily, we have intercepted communications from the Centauri that include both languages. Here are 12 sentences in Centauri and their 12 translations in Arcturan. Unfortunately, because we have only been eavesdropping, their meaning is unknown. However, we *do* know that the sentence pairs on each line are translations of each other. We want to use this information to translate the original peace message from the Centauri and then send this to the Arcturans. Your assignment will be to do this translation.

	CENTAURI	ARCTURAN
1	ok-voon ororok sprok.	at-voon bichat dat.
2	ok-drubel ok-voon anak plok sprok.	at-drubel at-voon pippat rrat dat.
3	erok sprok izok hihok ghrok.	totat dat arrat vat hilat.
4	ok-voon anak drok brok jok.	at-voon krat pippat sat lat.
5	wiwok farok izok stok.	totat jjat quat cat.
6	lalok sprok izok jok stok.	wat dat krat quat cat.
7	lalok farok ororok lalok sprok izok enemok.	wat jjat bichat wat dat vat eneat.
8	lalok brok anak plok nok.	wat lat pippat rrat nnat.
9	wiwok nok izok kantok ok-yurp.	totat nnat quat oloat at-yurp.
10	lalok mok nok yorok ghrok klok.	wat nnat gat mat bat hilat.
11	lalok nok crrok hihok yorok zanzanok.	wat nnat arrat mat zanzanat.
12	lalok rarok nok izok hihok mok.	wat nnat forat arrat vat gat.



C. Interstellar First Contact (2/3)

C-1 Let's start with the first Centauri word: "farok". This word occurs in two of our Centauri sentences. Given that Arcturan translations of these sentences only have one word in common with each other, we can assume that this word is the translation for "farok". Which word is it?

farok

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C-2 Do the same thing for "hihok" and "yorok". For "yorok" you will need to make some assumptions about word ordering.

hihok

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yorok

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C-3 The Centauri word "clok" only occurs once. However, you can figure out its Arcturan translation in another way.

clok

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C-4 Try to use the processes from the previous assignments to complete as much as possible of the following table.

crrok

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kantok

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ok-yurp

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C-5 Complete the translation of "farok crrok hihok yorok clok kantok ok-yurp." Keep in mind that Centauri and Arcturan sentences can have a different word order. There may be more than one correct reply. Just give *one* of them. *Hint:* No word is repeated.

C-6 After some years a reply message is received in Arcturan. It reads, "Totat nnat forat arrat mat bat." Translate this message into Centauri. There may be more than one correct reply. Just give *one* of them.



C. Interstellar First Contact (3/3)

C-7 For which Arcturan word does a translation alternative exist? Answer by putting a cross in the box beside the correct answer.

- | | |
|----------------------|--------------------------|
| a) totat | <input type="checkbox"/> |
| b) nnat | <input type="checkbox"/> |
| c) forat | <input type="checkbox"/> |
| d) arrat | <input type="checkbox"/> |
| e) mat | <input type="checkbox"/> |
| f) bat | <input type="checkbox"/> |
| g) none of the above | <input type="checkbox"/> |

C-8 For which Centauri word (or words) does an Arcturan translation alternative exist? Answer by putting a cross in the box beside the word (or words) chosen.

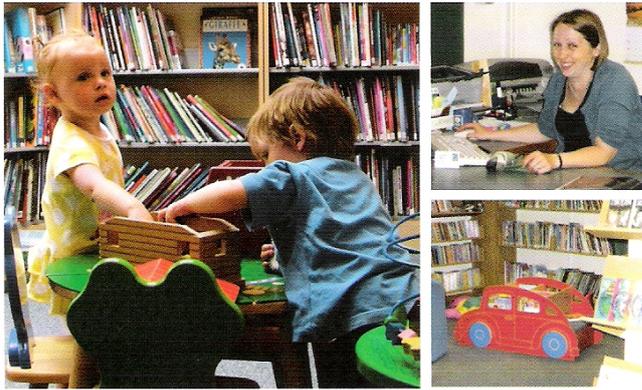
- | | |
|----------------------|--------------------------|
| a) erok | <input type="checkbox"/> |
| b) ghirook | <input type="checkbox"/> |
| c) wiwok | <input type="checkbox"/> |
| d) izok | <input type="checkbox"/> |
| e) lalok | <input type="checkbox"/> |
| f) none of the above | <input type="checkbox"/> |

D. Wales of a time (1/2)

[10 points]

Here is a bilingual leaflet in Welsh, with English translations, about the library service in Gwynedd (a Welsh county). Use the leaflet to answer the questions below about Welsh.

**GWASANAETH LLYFRGELL
GWYNEDD
LIBRARY SERVICE**



- Cyfrifiaduron at ddefnydd cyhoeddus am ddim – Free public use computers
- Ceisiadau llyfrau am ddim oddi fewn Cymru – Free book requests within Wales
- Llyfrau Llafar – Audio Books
- Llyfrau Print Bras – Large Print Books
- Cylchgrawn Which? – Which? Magazine
-  gwefan hel achau teuluoedd, ar gyfrifiaduron y llyfrgelloedd yn unig
website to search family history, on library computers only.

Gallwch ddefnyddio eich cerdyn llyfrgell yn unrhyw lyfrgell yng Ngwynedd, Conwy ac Ynys Môn
You can use your library card at any library in Gwynedd, Conwy and Anglesey

Am fwy o wybodaeth am eich llyfrgell leol a Gwasanaeth Llyfrgell Gwynedd
For more information about your local library and Gwynedd Library Service

www.gwynedd.gov.uk/llyfrgell
www.gwynedd.gov.uk/library

E-bost – llyfrgell@gwynedd.gov.uk
E-mail – library@gwynedd.gov.uk





D. Wales of a time (2/2)

D-I On the basis of what is written on this brochure, can you work out the Welsh for the following: (Where there are alternate forms of a word write them one under the other in spaces provided)

1	books																		
2	library																		
3	libraries																		
4	book																		
5	Wales																		
6	computers																		
7	in Gwynedd																		
8	within Gwynedd																		
9	large magazine																		
10	free books																		
11	on computers																		
12	any books																		

E. Crocodile Bardi (1/4)

[20 points]

Bardi is part of the Nyulnyulan language family and is the traditional language of the Bardi people, who live in and around One Arm Point and the Lombadina/Djarrindjin Aboriginal Communities, along the coast of Australia's Kimberley Region. Although about a thousand people identify as Bardi, only a handful of people can be considered fluent speakers of the Bardi language.

E-I In the diagram of the scene (below), note that both you and the speaker are facing the paper. The bird is to the left of everything else and the kangaroo is to the right of everything else. The cat is behind everything else and the kangaroo is in front of everything else.



Here are some Bardi sentences describing the diagram:

1. Aamba bornkony yaawardon.
2. Baawa joorroonggony garrabagoon.
3. Boorroo alaboor yaawardon.
4. Lila alaboor ooranygoon.
5. Lila baybirrony aambon.
6. Minyaw baybirrony baawon.
7. Oorany joorroonggony baawon.
8. Yaawarda bornkony aambon.



E. Crocodile Bardi (2/4)

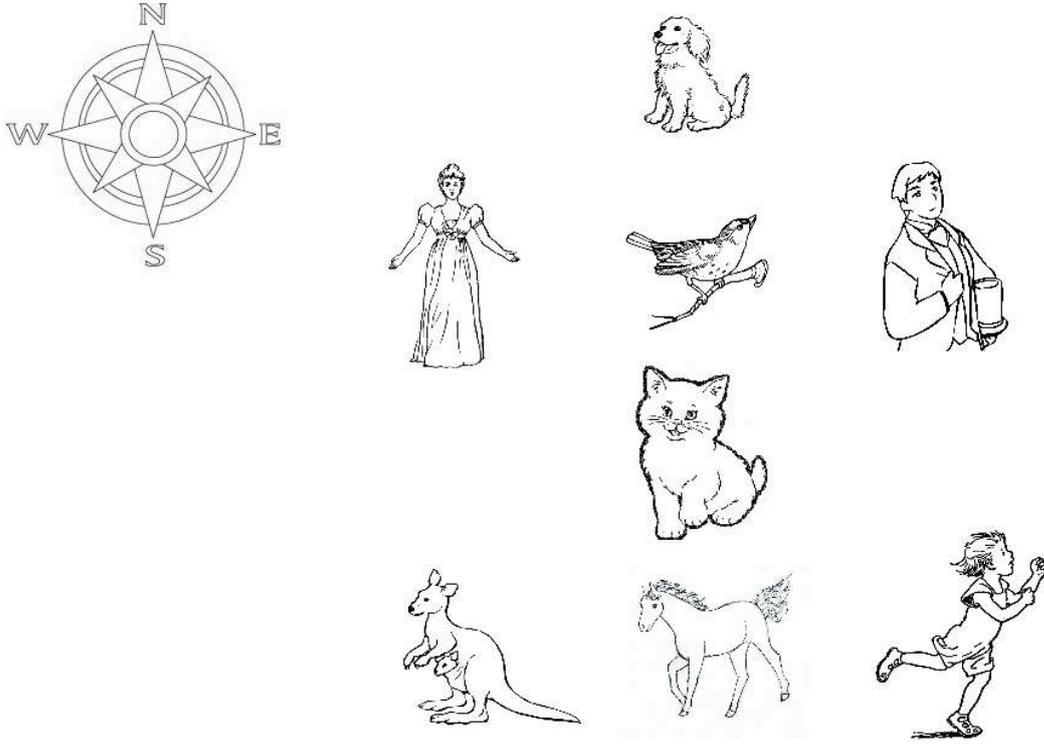
Using the sentences on the previous page, fill in the chart below with words from the “Bardi Word Bank.” Each Bardi word should be used exactly *once*. (Three of the English words have been matched with their Bardi translation as an illustration.)

Bardi Word Bank		English Word Bank	Bardi Translation (number)
1.	Aarlgoodony	Bird	12
2.	Aamba	Cat	
3.	Alaboor	Dog	
4.	Baybirrony	Horse	
5.	Boorroo	Kangaroo	
6.	Bornkony	Man	2
7.	Lila	Woman	
8.	Joorroonggony	Next to	
9.	Minyaw	Behind	
10.	Oorany	In front of	
11.	Yaawarda	To the right of	
12.	Garrabal	To the left of	
13.	Baawa	Child	13



E. Crocodile Bardi (3/4)

E-2 Here is a diagram of a different scene, with a compass rose added:



Here are some descriptions of this scene:

1. Aamba ardi inin boorroogo.
2. Aamba baana inin oorany.
3. Baawa aalgamadan inin yaawardago.
4. Baawa alang inin aambago.
5. Garrabal goolarr inin aambago.
6. Garrabal goolarr inin baawago.
7. Lila ardi inin yaawarda.
8. Lila ardingarr.



E. Crocodile Bardi (4/4)

Using these sentences and what you learned from E-1, fill in the boxes below with the English symbols E, N, NE, NW, S, SE, SW, and W (the eight main cardinal directions). This time, each symbol may be used more than once, exactly once, or not at all. For example, in the first blank box, you could enter “E or S” or just “N”.

Make sure to use the word “or” if there is more than one direction per box.

Bardi Word	English Direction(s)
Aalgamadan	
Alang	
Ardi	
Baana	
Goolarr	



F. Haitian Creole (1/2)

[25 points]

Haitian Creole is a language spoken by 10 million people in Haiti. Most of the words come from French, the language of the colonial plantation owners and managers, but their pronunciation and the way they are used in sentences was strongly influenced by African languages spoken by the slaves transported to Haiti from Africa to work in the sugar plantations.

The combinations **an**, **en**, and **on** denote nasal vowels (partially produced through the nose). The Table below lists nouns in Haitian Creole with definite articles and the corresponding English translations:

1	kòl la	the necktie
2	jaden an	the garden
3	lanp lan	the lamp
4	kouto yo	the knives
5	mayi a	the maize
6	lanmou an	the love
7	ri a	the street
8	pant lan	the slope
9	manman an	the mother
10	kabann nan	the bed
11	sant yo	the odours
12	lèt la	the letter
13	sans lan	the sense
14	telefòn nan	the telephone
15	kò a	the body
16	mi an	the wall
17	fanm nan	the woman
18	joumou an	the pumpkin
19	ban an	the bench, the ban
20	kay la	the house
21	fanmi an	the family
22	pon an	the bridge
23	liv yo	the books
24	dam nan	the lady



F. Haitian Creole (2/2)

F-I Complete the tables below. If more than one answer is possible, pick the singular one. Note that the two columns are aligned (“lalin” means “moon”). To get credit, please use the same formatting as in the previous Table, that is the Creole column should contain a noun followed by an article whereas the English column should contain an article followed by a noun.

You need to add the missing four Creole nouns, twelve Creole articles, and two English nouns.

l	a	l	i	n						
p	i	t	i	m	i					
m	u	z	i	k						
m	a	l	d	a	m	o	u			
k	a	p								
r	a	d	y	o						
v	a	n	t							
t	a	n								

t	h	e		m	o	o	n									
t	h	e		m	i	l	l	e	t							
t	h	e														
t	h	e		l	o	v	e	-	s	i	c	k	n	e	s	s
t	h	e		k	i	t	e									
t	h	e														
t	h	e		b	e	l	l	y								
t	h	e		t	i	m	e									
t	h	e		k	n	i	f	e								
t	h	e		b	o	d	i	e	s							
t	h	e		o	d	o	u	r								
t	h	e		b	o	o	k									

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OzCLO problem sets are created in cooperation with:

NACLO (North American Computational Linguistics Olympiad)
AILO (All Ireland Linguistics Olympiad)
UKLO (UK Linguistics Olympiad)

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