

OzCLO
Australian Computational and Linguistics
Olympiad
National Round 2023

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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 **team 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. There are **six** problems. 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 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.

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 these problems completely in the time allotted. So don't be discouraged if you don't finish everything.

Enjoy!

<1> Eat, drink and enjoy Welsh¹ (1/2)

Welsh is a Celtic language spoken in Wales, which makes it the oldest surviving language in the UK. Currently, just over 880,000 people speak Welsh, and the language is becoming more widely spoken after a long period of decline.

Task 1. In the table below are some Welsh sentences with their English translations, except they have been mixed up. Match the Welsh sentences to the correct English translations.

	Welsh sentences		English sentences
1	Mae e'n yfed cwrw.	a	I am not drinking beer.
2	Dw i ddim yn yfed cwrw.	b	You are not eating meat.
3	Rwyt ti'n bwyta llysiau.	c	Is she eating cake?
4	Dw i'n yfed coffi.	d	Are you (lot) enjoying (some) chocolate?
5	Ydy hi'n bwyta cacen?	e	They are eating pasta.
6	Wyt ti'n yfed te?	f	You (lot) are not enjoying vegetables.
7	Ydyn ni'n yfed coffi neu te?	g	He is drinking beer.
8	Dwyt ti ddim yn bwyta cig.	h	They are not enjoying tea.
9	Dych chi'n mwynhau siocled?	i	You are eating vegetables.
10	Dydyn nhw ddim yn mwynhau te.	j	I am drinking coffee.
11	Maen nhw'n bwyta pasta.	k	Are we drinking coffee or tea?
12	Dych chi ddim yn mwynhau llysiau.	l	Are you drinking tea?

Answers:

1	2	3	4	5	6	7	8	9	10	11	12

Task 2. Now translate the following sentences into Welsh.

	English sentences	Welsh translations
13	You (lot) are drinking coffee.	
14	Is he drinking tea?	
15	We are not enjoying beer.	
16	She is eating chocolate.	
17	Are they drinking coffee?	

¹ Created by Babette Verhoeven (NACLO).

<1> Eat, drink and enjoy Welsh (2/2)

Task 3. Look at the sentences in the table below. Can you complete the table?

	English sentences	Welsh sentences
18	She liked coffee.	Roedd hi'n hoffi coffi.
19	They didn't enjoy chocolate.	Doedden nhw ddim yn mwynhau siocled.
20	Did he like chocolate?	
21	Did we eat vegetables?	
22		Roedden ni'n yfed cwrw.
23	We did not drink tea.	
24		Doeddech chi ddim yn mwynhau llysiau.
25	Did you (lot) like meat?	

<2> To Agree or Not Agree² (1/2)

This problem focuses on some differences between Old English³ and Present Day English in the forms of pronouns and verbs. The examples are not taken from any texts, but are based on sentences found in texts of the ninth and tenth centuries.

NOTE: the pronunciation of the letters is not important for this problem. For the most part, Latin letters were used to represent similar sounds in Old English. The letter æ represented a vowel similar to 'a' in Present Day English *hat*. The symbol þ, called 'thorn', comes from the runic alphabet and was pressed into service to represent sounds not found in Latin, the two sounds of 'th' in Present Day English *thy* and *thigh*.

Consider these Old English sentences and their Present Day English counterparts.

	Present Day English	Old English
1.	<i>Æthelwine and Wulfstan saw these men. They greeted them.</i>	Æþelwine and Wulfstan gesawon þas men. Hi hi gretton.
2.	<i>Does it save us?</i>	Nereþ hit us?
3.	<i>The king and the bishop and I saw the archbishop. We greeted him.</i>	Se cyning and se bisceop and ic gesawon þone arcebisceop. We hine gretton.
4.	<i>What do we say?</i>	Hwæt cweþe we?
5.	<i>The teaching saves you.</i>	Seo lar eow nereþ.
6.	<i>We come.</i>	We cumað.
7.	<i>We do not hear these women.</i>	Ne hiera we þas wifmen.
8.	<i>These men hear these women. They did not see them.</i>	þas weras hierað þas wifmen. Ne gesawon hi hi.
9.	<i>You heard these men.</i>	þu hierdest þas menn.
10.	<i>Then we heard you.</i>	þa hierde we þe.
11.	<i>King Alfred and the bishop rode into the town. Then we saw them.</i>	Alfred cyning and se bisceop ridon into bære byrig. þa gesawe we hi.
12.	<i>Did you see us?</i>	Gesawe ge us?
13.	<i>What do you perform?</i>	Hwaet fremest þu?
14.	<i>Did we perform it?</i>	Fremede we hit?

² Created by Cynthia Allen (OzCLO).

³ If someone referred to Old English, would you think of the language of Shakespeare, who was active at the end of the sixteenth century and beginning of the seventeenth, or possibly of Geoffrey Chaucer's *Canterbury Tales*, written c. 1385? In the standard periodisation of English, Shakespeare's language is actually Early Modern English, while Chaucer was writing late Middle English. English was brought to England from Germany and northern Denmark in the early fifth century, before the conversion of the English to Christianity. It was occasionally written in inscriptions using the Germanic runic alphabet. A small number of English writings in the Latin alphabet appear c. 700, but it is only in the ninth century that we find a substantial body of texts. The Old English (also known as Anglo-Saxon) period extended to c. 1100, when enough changes to the language had happened that it would be unintelligible to the people who brought the language to England. If Old English was incomprehensible to the speakers of the Middle English period, this is even more true for Present Day English speakers. Many changes have taken place in all areas of the language, meaning that a Present Day English speaker must learn it as a foreign language like its West Germanic relatives German and Dutch.

<2> To Agree or Not Agree (2/2)

Task 1. Translate these Old English sentences into Present Day English:

15.	Ne hierde ge hi	
16.	We gesawon eow	
17.	Ne gesawon hi þe	
19.	Hi hit fremedon	
20.	Ne neredede we þe	

Here are some more Old English sentences:

21.	Wit hieraþ þæt word and wit cwepaþ hit.	<i>We hear the word and we say it.</i>
22.	Se cyning and ic gesawon þas hreoflan, ac ne grette wit hi. þas hreoflan gretton unc.	<i>The king and I saw these lepers but we did not greet them. These lepers greeted us.</i>
23.	þonne cume wit to his rice.	<i>Then we come to his kingdom.</i>
24.	Æþelbald and ic gesawon eow, ac ne hierde wit eow. Wit gretton eow.	<i>Athelbald and I saw you, but we didn't hear you. We greeted you.</i>
25.	Edmund and Swiþun, ne hierde git þas wifmen, ac wit hieraþ hi. þas wifmen hieraþ inc.	<i>Edmund and Swithun, you do not hear these women, but we hear them. These women hear you.</i>

Task 2. According to each of the four situations described, give the appropriate Old English translations of this Present Day English sentence: *We saw you.*

i.	Athelwine tells the three men that he and Wulfstan saw them.
ii.	I tell the archbishop that the king, the bishop and I saw him.
iii.	I answer this question positively: <i>Gesawe ge us?</i>
iv.	I tell Edmund and Swithun that Paulus and I had seen them.

Task 3.

Insert the missing verb in these Old English translations of the Present Day English sentences.

26. Ne _____ ge hi *You did not greet them.*
27. Seo lar hi _____ *The teaching saves them.*
28. Git hit _____ *You two say it.*
29. þa _____ hi us *Then they heard us.*

Task 4. Translate this Present Day English sentence into Old English.

30.	Did they obey Edmund and Wulfstan?	
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<3> What / Where / Who / Why is Albanian?⁴ (1/1)

Here are some questions in Albanian, an Indo-European language spoken in the Balkans region of Europe. It is the official language of Albania and the majority language of Kosovo. These questions are in random order, while their English translations are listed in alphabetical order. NOTE: ë is a vowel and ç is a consonant, and *you* is always singular.

- | | |
|--------------------------|-----------------------------------|
| 1. Pse është në Angli? | A) Did you drink anything? |
| 2. Kujt ia shiti? | B) Did you kill someone? |
| 3. Kë vrau? | C) How did you dance? |
| 4. Pse ia shite? | D) How much did he cut? |
| 5. Kur arriti në Angli? | E) What did he buy? |
| 6. Kush është gati? | F) What did you drink? |
| 7. Kur mësove shqip? | G) What is this? |
| 8. Sa preu? | H) When did he sell it to him? |
| 9. Ku është i ati? | I) When did he arrive in England? |
| 10. Çfarë bleu? | J) When did you learn Albanian? |
| 11. Kush është në Angli? | K) Where is his father? |
| 12. Si kërceve? | L) Where did the cat go? |
| 13. Çfarë është kjo? | M) Who did he wash? |
| 14. Ku vajti macja? | N) Who did he sell it to? |
| 15. Kë lau? | O) Who did he kill? |
| 16. A vrave dikë? | P) Who is in England? |
| 17. Çfarë pive? | Q) Who is ready? |
| 18. Kur ia shiti? | R) Who is this? |
| 19. Kush është kjo? | S) Why did you sell it to him? |
| 20. A pive gjë? | T) Why did you learn Albanian? |
| 21. Pse mësove shqip? | U) Why is he in England? |

Task 1. Match the Albanian phrases with their English translations by writing the letter corresponding to the English translation below the number of Albanian sentence.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	

Task 2. Translate these Albanian sentences into English:

a.	Ku kërceu?	
b.	A është macja gati?	
c.	Çfarë preve?	
d.	A shiti gjë?	

Task 3. Translate these four English sentences into Albanian:

e.	How much did his father drink?	
f.	What did you buy?	
g.	Did you wash someone?	
h.	How did the cat dance?	

⁴ Created by David Hellsten.

<4> MaROONed⁵ (1/1)

Roon is an Austronesian language spoken by more than 1,000 people in Indonesia. Roon has changed since it was first recorded by European explorers over 150 years ago.

This problem investigates Roon numerals as they were spoken in 1855, 1955, and 2012. (Some numbers given here are slightly simplified for the purpose of this puzzle.)

Some numerals have remained the same:

#	1855	1955	2012
2	suru	suru	suru

Others have changed once:

#	1855	1955	2012
10	onemerim	safur	safur

However, the majority of numerals have changed twice:

#	1855	1955	2012
7	onemenuru	rimenuru	fik
32	arsos safur suru	aresoyosier safur suru	ares kior beberin suru

Below are numbers or expressions in Roon, representing the same value but in different years. + and × represent addition and multiplication respectively.

#	1855	1955	2012
(a)	suru × gokor	rimeyosier	yosier + rim
(b)	onem × fak	igokor × rimigokor	ares suru beberin fiak
(c)	safur onem + onemefak	aresoyosier rim	siw × suru + fik
(d)	arsos di suru yoser + safur rim	safur suru + aresonuru fak	ares rim beberin wonem

Task 1. Replace letters (a) to (d) in the table above with the numbers in digits corresponding to their values.

(a) _____ (b) _____ (c) _____ (d) _____

Task 2. Fill in blanks (e–n) below with the proper number or Roon numeral (taking into account the year). Write only one numeral/value, not a mathematical expression.

#	1855	1955	2012
3	(e)	(f)	kior
6	(g)	(h)	(i)
8	(j)	(k)	war
(l)	(m)	(n)	safur fik

⁵ Adapted from problem created by Riley Kong.

<5> Getting the tone right in Abawiri⁶ (1/1)

Below are some phrases in Abawiri, sometimes also called Foau, a Lakes Plain language spoken by several hundred people in Western New Guinea, Indonesia. Their English translations are listed on their right.

Pronunciation notes: A mark above a vowel indicates its tone, i.e., the pitch it is pronounced at. Specifically, ` (e.g., à) indicates low tone, ¯ (e.g., ā) indicates mid tone, and ´ (e.g., á) indicates high tone. **β** is pronounced like **b** but with the lips only lightly touching. **g** is a single consonant pronounced like **gw**. Both **ɛ** and **ɔ** are vowels, similar to vowel sound in English *bear* and first 'o' in *borrow* respectively.

1. [bóru gʷákù]	fish's ear	5. [àjà sòkrè]	chicken's rat
2. [sòkrē dúkè]	rat's bird	6. [dúké sòri]	bird's earth
3. [dèβi àitè]	child's father	7. [dèβí wùtù]	child's car
4. [àité dèβi]	father's child	8. [sòri βórù]	earth's fish

Task 1. Translate the Abawiri phrases (a) to (c) into English.

a.	[àjà βórù]	
b.	[dúké àitè]	
c.	[wùtù dúkè]	

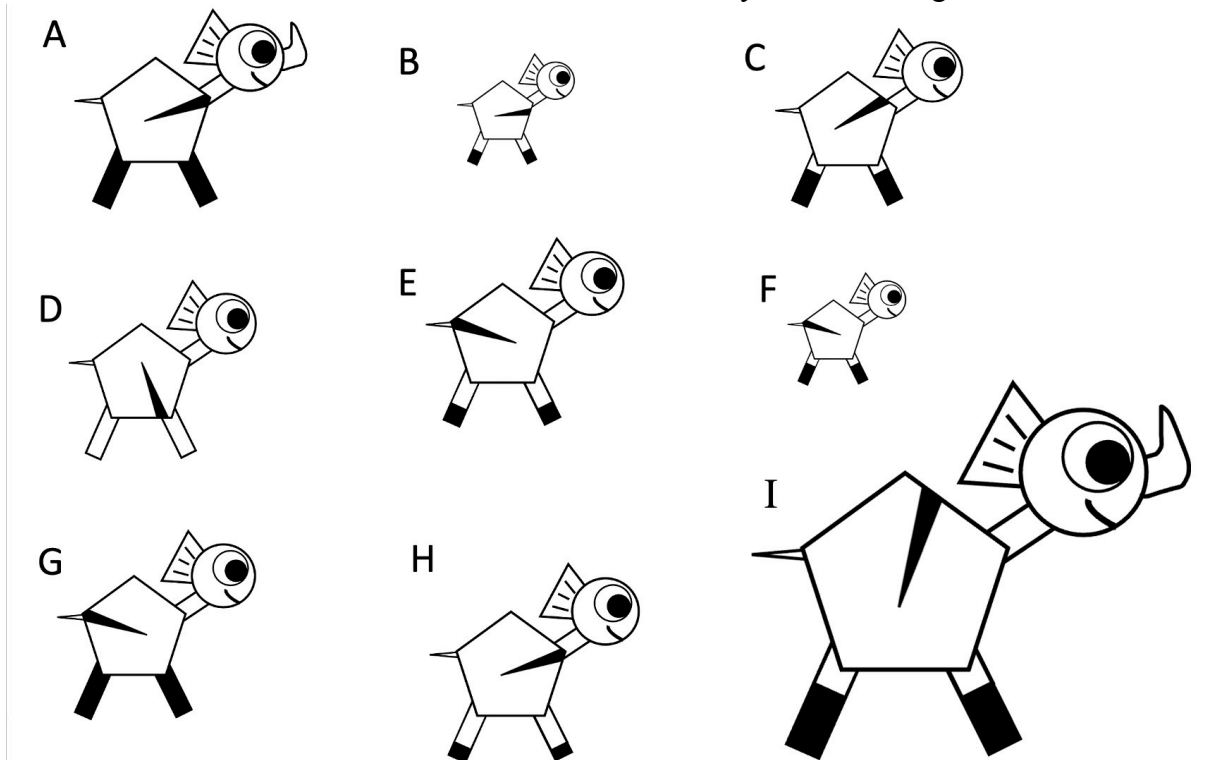
Task 2. Translate the English phrases (d) to (i) into Abawiri making sure that you mark the tones correctly.

d.	car's earth	
e.	bird's car	
f.	father's rat	
g.	child's fish	
h.	earth's chicken	
i.	father's ear	

⁶ Created by Daniel Lovsted (NACLO).

<6> Vloxes⁷ (1/2)

Exciting news: You've gotten clearance to visit Mars! Your job there is to take care of some Martian animals called vloxes. Here are the 9 vloxes that you are in charge of:



Your manager asks you to identify which vloxes fit the following descriptions:

- The two mellivu vloxes
- The two mellovu vloxes
- The two kibb vloxes
- The two azeltorf vloxes
- The qliqli vlox
- The imxo vlox
- The three ravv vloxes
- The kibbish-zuff vlox
- The zuffish-kibb vlox

Unfortunately, many of these words are unfamiliar to you, and you don't have a dictionary! Luckily, you do have an encyclopedia article (on the next page) that uses these words. Even though the article doesn't define the words directly, you can figure out a lot about a word based on how it is used in context. In fact, this basic strategy is an important approach in computational linguistics: When computers need to learn the meanings of words, they do so by analyzing the contexts that those words appear in.

Task 1. Based on what you can infer from the encyclopedia article, fill in the letter or letters of the vloxes that fit each description from your manager. You will need to use some letters more than once. (Write the letters corresponding to your choices to the right of the appropriate description received from your manager.)

Task 2. Fill in the blanks to create a description of the youngest vlox in the image. Each blank should be filled in with one of the following words: *zuff*, *kibb*, *tezz*, *womm*, *ravv*. You should not use the same word twice.

_____ ish- _____

⁷ Created by Tom McCoy (NACLO).

<6> Vloxes (2/2)

Vlox

From Marsipedia, the Martian encyclopedia

The vlox (*Vloxis vloxia*) is the most imxo species of zoobleporf. Due to its playful disposition, it is a popular pet throughout Mars.

Contents

- 1 Appearance
- 2 In popular culture

Appearance

Vloxes occur in two breeds: the polar vlox and the valley vlox. Polar vloxes are usually more mellivu than valley vloxes.^[1] Regardless of breed, all vloxes are born completely qliqli. As they mature, they become less and less qliqli. It is believed that all prehistoric vloxes were zuffish-kibb or tezzish-kibb, but modern vloxes display great variety in zlorvitude.

In popular culture

- In the “Olympus Mons Explorers” comics, Captain Dfdgb’s spaceship is called *The Mellovu Vlox*.
- The first Martian prime minister, Jzirla Jzirlsdaughter, was often seen with her kibbish-zuff vlox named Klgrdm.
- In the sitcom “Phobos and Deimos”, the main character Phobos has three imxo vloxes: a kibb vlox named Blorblim, a zuffish-ravv vlox named Qqqq, and a ravvish-womm vlox named Robert.
- The most popular song by the Bellona Quartet is “Lookin’ Like a Nearly Azeltorf Vlox,” which spent seven weeks at the #1 position on the Mercury Top 60 chart.

Notes

¹In a previous edition of this encyclopedia, we said that polar vloxes are more mellovu than valley vloxes. This was a typo - obviously, it makes no sense to say “more mellovu”!