

Australian Computational and Linguistics Olympiad  
2022

OzCLO website: [www.ozclo.org.au](http://www.ozclo.org.au)

**Proudly supported by these organisations**

Australian Linguistic Society (ALS)

Australasian Language Technology Association (ALTA)

Australian Commonwealth Scientific and Research  
Organization (CSIRO)

Centre of Excellence for the Dynamics of Language (CoEDL)

Department of Defence Science & Technology Organisation  
(DSTO)

The Australian National Dictionary Centre

**and these universities**

Charles Darwin University

Flinders University

Griffith University

Macquarie University

Western Sydney University

The Australian National University

The University of Melbourne

The University of Queensland

The University of Western Australia

## Welcome to Round One of the 2022 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 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 **80** points.
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 Booklets. (Make sure, you allow enough time to transfer your answers.)
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 do not 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 do not finish everything.

*We hope you enjoy the challenge.*

School:

Teacher:

Team members' names:

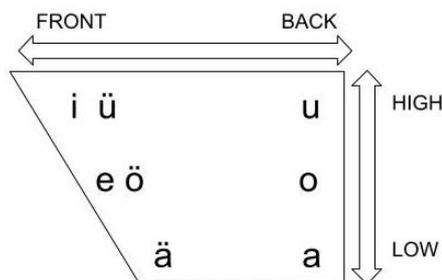
**<1> Rotuman variations<sup>1</sup> (1/2) 10 points**

Rotuman is an Austronesian language spoken by the indigenous people who live on the Rotuma group of South Pacific islands. These people have a Polynesian-influenced culture. These islands were incorporated as a dependency into the Colony of Fiji in 1881 and now are included in the Republic of Fiji.

Here are some Rotuman words, along with their so-called Incomplete Word counterparts. In spoken Rotuman, the Incomplete variant is commonly used for all but the last word of a phrase.

Complete word	Incomplete word	English translation
tokiri	tokir	'to roll'
sulu	sul	'coconut-spathe'
ti'u	ti'	'big'
masi	mäs	'figus (a type of tree)'
hoti	höt	'to embark'
pepa	peap	'paper'
vao	vao	'fishing net'
mose	mös	'to sleep'
tepli	tepel	'table'
kofi	köf	'coffee'
seseva	seseav	'erroneous'
rako	rak	'to imitate'
ŋarue	ŋarue	'work'
pure	puer	'to rule'
'uo	'uo	'a very bony kind of fish'
futi	füt	'to pull'
pusi	püs	'cat'
hafa	haf	'half'
ufa	uaf	'wharf'

**Pronunciation notes:** The symbols ' , ŋ represent consonants; ä, ö, ü are the fronted versions of the back vowels a, o, u respectively. Vowels are classed as relatively 'front' or 'back', 'high' or 'low' depending on the position of the tongue when they are pronounced. The Rotuman vowels are represented on this graphic.



1. Created by Ethan Chi (NACLO).

**<1> Rotuman variations (2/2)**

**Task:** Write the 'incomplete' variant of these Rotuman words.

<b>Complete word</b>	<b>Incomplete word</b>	<b>English translation</b>
Ranrani		'Britain'
lelei		'good'
soti		'shirt'
kesmasi		'Christmas'
suka		'sugar'
parofita		'prophet'
hosa		'flower'
mafa		'eye'
soge		'starve'
foa		'grater'

<2> Waanyi to the end<sup>2</sup> (1/2)

14 points

Waanyi is an Australian language spoken by people of the same name whose lands are situated south of the Gulf of Carpentaria stretching from western Queensland into the Northern Territory.

Here are 13 simple Waanyi sentences with an English translation.

1	Najba nyulu bururri kirriyaa.	The woman saw the man.
2	Kirriya nyulu najba bururrii.	The man saw the woman.
3	Bikali nyulu bulungu nangkani jukaa.	This boy carried the child.
4	Ngindi-ngindijbi nana bulungu wanamiyani.	That child was crying for water.
5	Yanyba nyulu bururri nanangkanyi kirriyaanyi.	The man spoke to that woman.
6	Daba nyulu nana juka nanangkani bulunguu.	That child hit that boy.
7	Karaa nyulu daba mani.	She hit him on the hand with a rock.
8	Nanganja nana kara!	Get that rock!
9	Ngaraba nyulu wanami nangkani bururrii.	This man is drinking water.
10	Bulungu ngawu windijbi wanamii.	I gave the child water.
11	Yanja ngaki!	Speak to me.
12	Windijbi nyulu ngaan karaa.	He gave me money.
13	Kurrkamalaa karaa nyulu ngaan windijbi.	He gave me a lot of money.

**Task 1.** Complete these 5 Waanyi sentences by adding the missing word or words.

14	Nanganja nyulu kara	<i>The boy picked up the rock.</i>
15	Nanganja nyulu	<i>He picked it up in his hand.</i>
16	Wanami nyulu nanganja	<i>This woman fetched water.</i>
17	Ngaraba nyulu	<i>That child drank it.</i>
18	Ngindi-ngindijbi ngamba	<i>We were crying for that boy.</i>

Here are seven more Waanyi sentences.

19	Jilaba nyulu wanami jujuu barri ngambalangi.	<i>The rain has now moved away from us.</i>
20	Budangku nyulu yanyba nangangi.	<i>She doesn't speak to him.</i>
21	Jujuu nyulu wandajba nangangi.	<i>He keeps away from her.</i>
22	Jungkunu nyulu yanyba ngambalangi.	<i>He sits and talks to us.</i>
23	Najba nyulu ngambalanya yanykurru.	<i>She saw us talking.</i>
24	Jungku ngamba nawunu.	<i>We are sitting here.</i>
25	Kuku-najba ngamba.	<i>We are looking at him.</i>

## &lt;2&gt; Waanyi to the end (2/2)

**Task 2.** Complete these Waanyi sentences by filling in missing words.

26	Naja _____	<i>Look at us!</i>
27	Wanamii nyulu _____ windijbi.	<i>She gave us water.</i>
28	Yanyba nyulu _____	<i>She talked to us.</i>

**Task 3.** Complete the English translation of these Waanyi sentences.

29	<i>Yanja nangangi.</i>	Speak _____
30	<i>Yanyba nyulu ngaki nana kirriya.</i>	That woman spoke _____

**Task 4.** Give two possible English translations for Waanyi sentence (31).

31	<i>Nanganja ngawu kurrkamala kara.</i>	a. I picked up a lot of _____ b. I picked up a lot of _____
----	--	--

## &lt;3&gt; Russian Baby Talk (1/2)

14 points



Russian children, just like children all over the world, take some months to learn all the sounds of their language. Below is a list of Russian words as they are pronounced by Ivan, a Russian boy aged about 2 years old, while watching his favourite cartoon, Smeshariki (pictured). The target word and Ivan's pronunciation are shown side by side, in phonetic transcription. The unfamiliar symbols are explained at the bottom. The English translation is given for your interest, but is not relevant to solving the problem.

Target	Child	English	Target	Child	English
smjesharikji	m'esdaik'i	[a name]	lgatj	gat'	lie
avtobus	atobus	bus	lashadka	washaka	horse
daroga	daoga	road	pila	piwa	saw
zjerkala	z'ekawa	mirror	rytsarj	xytsax'	knight
jogurt	jogut	yoghurt	samovar	samowax	kettle
kastrjula	katuwa	saucepan	skamjeika	kam'eika	bench
kolbachka	kobaka	sausage	stjiklo	t'iko	glass
karablj	kaab	ship	stuljchik	tut'ik	high-chair
kastjor	kat'ox	bonfire	tarjelka	tax'eka	plate
krasjitelj	kas'it'il'	dye	shokolad	shokowad	chocolate
kuvshin	kushin	jug			

**Pronunciation notes:<sup>3</sup>**

ch, sh and ts are each considered as single letters, representing one consonant sound.

j is pronounced like y in 'yes'. Where it appears immediately after a consonant, it can be thought of as showing that the consonant it follows has a softer (palatalised) pronunciation.

In transcriptions of Ivan's speech, the apostrophe ' has a similar function.

x is a hard guttural sound like a French R, or German 'ch' in Bach.

y is a vowel sound (pronounced like 'u' but with the lips drawn back as when saying 'i')

All other letters have more or less their expected pronunciation; there are no 'silent letters' (like 'k' in English 'knot' or 'b' in English 'comb').

3. Problem adapted by Harold Somers (AILA) from Russian IOL competition.

**<3> Russian Baby Talk (2/2)**

**Task.** Under each Russian word given in a-n, write Ivan's version of it. (Again the English is given only for information.)

(a) stakan (glass)	(b) chainik (kettle)	(c) baraban (drum)	(d) gorshok (pot)	(e) jabloko (apple)
(f) pjechka (stove)	(g) leika (watering can)	(h) skjeit (skate)	(i) podarocek (gift)	(j) buterbrod (sandwich)
(k) globus (globe)	(l) tjelegraf (telegraph)	(m) chernila (ink)	(n) vostok (east)	

**<4> Arhuaco Things & Places<sup>4</sup> (1/2) 16 points**

Arhuaco is a language spoken by the Arhuaco people in Northern Colombia, who still live traditionally and use their language widely. It is estimated that of the 8,000 speakers of Arhuaco, 90% are monolingual, with only a minority also speaking Spanish, Colombia's main language. The language is also known by a host of other names, including Ica and Bintuk.

Arhuaco is written here with some special characters, but these are not relevant for doing the tasks below.

<b>Arhuaco</b>	<b>English translation</b>
kʌn gaka	put down the stick
ribru pan	put down the book
ribru itšoʔ	put the book up on (e.g. bookshelf)
masite gaka	put down the machete
masite igeika	put the machete up (e.g. on a wall)
masite kʌgaka	put the machete in (e.g. the box)
pratu tšoʔs	put down the plate (e.g. in drying rack)
ribru kʌpas	put the book in (e.g. a bag)
pratu pan	put down the plate (e.g. on the table)
pratu ipan	put the plate up (e.g. on a wall)
urakii sa	put down the house
aʔni sa	put down the rock
aʔni isa	put the rock up on (e.g. a shelf)

**Task 1.** Translate these sentences into Arhuaco. Write in the space below the English.

1	Put down the needle (needle = akusa)
2	Put the rock in (e.g. a bag)
3	Put the pencil in (e.g. a pencil case) (pencil = rapi)
4	Put down the sack of corn (sack of corn = in kintari)
5	Put the sack of corn up on (e.g. a shelf)

## &lt;4&gt; Arhuaco Things &amp; Places (2/2)

**Task 2.** Write down the correct Arhuaco ‘put’ verb for the following scenarios:

6	Put a poster on a wall	
7	Put down a poster rolled up in a carrying tube	
8	Put a poster rolled up in a carrying tube in the cupboard	

Arhuaco men wear very distinctive traditional hats, as you can see in the images.



**Task 3.** Translate into Arhuaco where ‘hat’ is *tutusoma*

9	Put the hat on (e.g. your head)	
10	Stand the hat upright on the floor	

**Task 4.** When an Arhuaco says “*tutusoma kassa*”, where might he have put his hat? Choose from one of the following by writing the appropriate letter in the box:

- a. On the ground.
- b. Up on a shelf.
- c. In his bag.

**<5> The Spirit is Willing, but the Flesh is Wik<sup>5</sup> (1/1) 26 points**

Wik-Mungkan (literally: "to swallow one's words") is a Paman language spoken on the western side of Cape York Peninsula in Queensland, Australia by around 1,650 people most of whom live at Aurukun.

Here is a list of Wik-Mungkan words and phrases (1-24) and a list of English expressions that correspond in meaning to the Wik-Mungkan expressions, but are listed in a random order. HINT: *ek* can translate English *shell*.

1. ma' ek	13. ngangk	A. alcohol	M. heart
2. ma' puk pi'an	14. ngangk ek	B. awake	N. law
3. ma' puuy	15. ngangk min	C. brave	O. sad
4. ma' thayan	16. ngangk thayan	D. crab	P. shoulder blade
5. mee'	17. ngangk way	E. crab shell	Q. sound asleep
6. mee' thayan	18. puuy	F. English language	R. spring (water source)
7. mee' weep	19. puuy ek	G. eye	S. strong / firm
8. min	20. thayan	H. fingernail	T. thumb
9. ngak	21. weep thayan	I. fresh water	U. hard shell
10. ngak mee'	22. wik kiith	J. good	V. trustworthy with things
11. ngak min	23. wik thayan	K. handcuffs	W. water
12. ngak way	24. ek thayan	L. happy	X. tired

**Task 1.** Determine the correct correspondences. Show your answers by writing the appropriate letter (A-X) beside the number of the corresponding Wik-Mungkan expression.

1		7		13		19	
2		8		14		20	
3		9		15		21	
4		10		16		22	
5		11		17		23	
6		12		18		24	

**Task 2.** Give the Wik-Mungkan for these two English words:

hand \_\_\_\_\_ bad \_\_\_\_\_