AILO

All Ireland Linguistics Olympiad

The Problem Solvers' Challenge

Sample Set Two - October 2018

Teacher / Student Guide

This pack includes:

- introductory logic and language puzzles.
- Problem-solving career profile from an Irish Language Technology PhD Student
- Last year's samples, workshops and competition papers: https://ailo.adaptcentre.ie/sample-puzzles/2018-2/
- Free nationwide workshops: https://ailo.adaptcentre.ie/enter/workshops-20189/

Puzzle Guide

The "Curragh of Kildare" puzzle and solution

- Helps students to recognise features based on Irish place names.
- It is useful to look at how rules are written about a language that you may know.

The "Reach for the Top" puzzle and solution (difficult)

- Ilocano was written in the Baybayin script.
- Ask students to write down any observations / rules they see about the writing system.

Students should attempt AILO February 2018 Preliminary / Round One if they have not done it:

- https://ailo.adaptcentre.ie/sample-puzzles/2018-2/

Career Profile

- Abigail Walsh, Irish Language Technology PhD Student, ADAPT Centre, Dublin City University.

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Part of: Problem-Solving Initiative

Supported by: Science Foundation Ireland sfi For what's next

YOUR NAME: REGISTRATION #:

(20 points)

(J) The Curragh of Kildare (1/2)

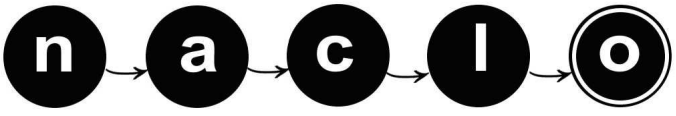
And straight I will repair
To the Curragh of Kildare
For it's there I'll find tidings of my dear
[Irish Folk Song]

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



YOUR NAME: REGISTRATION #:

(J) The Curragh of Kildare (2/2)

J1. 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:

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

J2. Explain your reasoning and provide any additional observations about this problem.

(J) The Curragh of Kildare

J1. Determine the Irish names of the following villages and translate each name.

	English	Irish	Translation
20	Mullaghbane	***An Mullach Bán***	***The White Summit***
21	Killananny	***Cill an Eanaigh/ Coill an Eanaigh***	***Church of the Fen/ Wood of the Fen***
22	Knocknakillardy	***Cnoc na Cille Airde/ Cnoc na Coille Airde***	***Hill of the High Church/ Hill of the High Wood***
23	Gortnabinna	***Gort na Binne***	***Field of the Peak***
24	Clashgortmore	***Clais an Ghoirt Mhóir***	***Pit of the Big Field***
25	Killbeg	***An Chill Bheag/ An Choill Bheag***	***The Small Church/ The Small Wood***
26	Blackcastle	***An Caisleán Dubh***	Black castle

J2. Explain your answers.

Orthographic correspondences: The English names are phonetic imitations of the Irish names. The letter correspondences (Irish/English) include *c/k*, *ch/gh*, and *aigh/y*, but many Irish letters do not have English equiavalents; for example, there is no distinction between *cill* and *coill*.

Irish place names: The names fit the following pattern, where brackets represent optional parts; note that adjectives come after the respective nouns:

[An] <noun-1> [<adjective-1>] [an/na <noun-2> [<adjective-2>]]

If a name includes a second noun, it is in the "of" form, which is analogous to the "<noun>'s" form in English, such as "John's." If it includes an adjective after the "of" noun, this adjective is also in the "of" form. Furthermore, an article before the "of" noun is sometimes *na* rather than *an*. We can identify the related patterns by comparing the two forms.

Nouns:

Base form	"Of" form	Trans-lation
gort	an ghoirt	field
an currach	an churraigh	marsh
an pháirc/páirc	na páirce	park
cill	na cille	church
an choill	na coille	wood
an bun/ bun	?	base
an bhinn	?	peak
baile	?	town
cluain	?	meadow
gleann	?	valley
eanach	?	fen

Base form	"Of" form	Trans-lation
an dún	?	ford
talamh	?	land
an mhainistir	?	abbey
an chlais	?	pit
?	na muice	pig
?	an mhullaigh	summit
?	an uain	lamb
?	an chairn	mound
?	an chaisleáin	castle
?	an chnoic	hill

We notice two classes of nouns.

Class A: The nouns whose last vowel is *i*.
- Insert *–h–* in the base form when preceded by the article.
- Add *–e* in the end to construct the "of" form.
- Use the article *na* in the "of" form.

Class B: The nouns whose last vowel is not *i*.
- No changes in the base form.
- Add *–i–* before the last consonant cluster to construct the "of" form.
- Use the article *an* and insert *–h–* after the first consonant in the "of" form.

Adjectives: The behavior of an adjective depends on the class of the related noun.

Base form		**"Of" form**		**Translation**
Class A	Class B	Class A	Class B	
	dhubh		duibhe	black
	bhán	bháin		white
ard				high
	íseal			low
mór	mhór			big
beag				small

An adjective after a Class A noun behaves like a Class A noun with an article. Similarly, an adjective after a Class B noun behaves like a Class B noun with an article.

English place names: The Irish words always have the same English correspondence, regardless of their grammatical form, with the exception of the *–ach/–aigh* words; for example, *bán*, *bháin*, *bhán*, and *báine* all correspond to *–bane* in an English name.

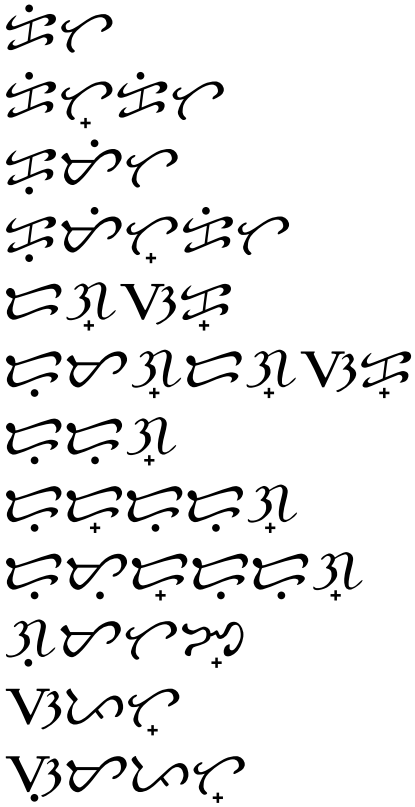
YOUR NAME: REGISTRATION #:

(20 points)

(C) Reach for the top (page 1/2)

The Ilocano language is one of the major languages of the Philippines, spoken by more than 8 million people. Today is it written in the Roman alphabet, which was introduced by the Spanish, but before that Ilocano was written in the *Baybayin* script. *Baybayin* (which literally means "spelling") was used to write many Philippine languages and was in use from the 14th to the 19th centuries.

C1 (practical). Below are twelve Ilocano words written in Baybayin. Match them to their English translations, listed in scrambled order below.



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{ to look, is skipping for joy, is becoming a skeleton, to buy, various skeletons, various appearances, to reach the top, is looking, appearance, summit, happiness, skeleton }

C2 (practical). Fill in the missing forms.

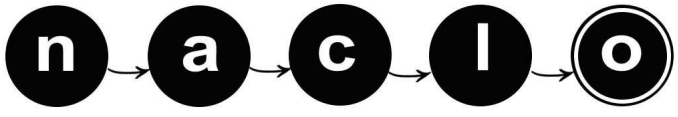
_____

_____

_____

_____ (the/a) purchase

_____ is buying



YOUR NAME: REGISTRATION #:

(C) Reach for the top (page 2/2)

C3 (theoretical). Explain the reasoning behind your solutions to C1 and C2.

(C) Reach for the top

C1. Match Ilocano words to their English translations.

	appearance
	various appearances
	to look
	is looking
	happiness
	is skipping for joy
	skeleton
	various skeletons
	is becoming a skeleton
	to buy
	summit
	to reach the top

C2. Fill in the missing forms.

	to become a skeleton
	various summits
	is reaching the top
	(the/a) purchase
	is buying

C3. Explain the reasoning behind your solutions.

The first step is to divide the English items into semantically similar groups, and the Baybayin items into groups based on shared symbols. We then deduce that the group including must correspond to the "look/appearances" group (four members each), must correspont to the "skeleton" group (three members each), and must be "to buy." We also need to figure out the nature of the Baybayin alternations, which include two basic processes:

- From the basic form, copy the initial two symbols and add them to the beginning. The first symbol retains its diacritic, whereas the diacritic of the second symbol is replaced by a cross below.
- Insert  as the second symbol, move the diagritic of the initial symbol to , and add an underdot to the first symbol.

Career Profile

Name: Abigail Walsh

Job title: Irish Language Technology PhD Student

Current Study: ADAPT Research Centre, Dublin City University
https://www.adaptcentre.ie/

Industry: Natural Language Processing (NLP)

Education and Work Experience

Undergraduate
I finished my undergraduate degree in Computer Science and Language at Trinity College Dublin in 2016. After graduating, I was employed as a research assistant at the ADAPT Centre, before starting my PhD here. I also did several research internships in the areas of NLP and Machine Learning, one of which was the ADAPT Internship.

Internship
My internship title was Semantic Fuzzy Matching for Translation Memory. At the time of my internship at ADAPT, I was questioning my career path and whether I was suited to academic work. I was also experiencing some burnout, after a stressful final year. My internship at ADAPT gave me a positive experience in setting my own goals and deciding which challenges I could tackle, within the framework of an existing research project. I discovered aspects of research I truly enjoyed, and other areas I was struggling in.

Current Role

Main Tasks and Responsibilities
As a PhD Candidate, I research the automatic processing of multiword expressions in Irish - this topic lies at the intersection of linguistics, machine learning, Irish language and technology.

What are the main skills you learned during your job at ADAPT?
Aside from learning practical research skills, and honing my knowledge of the topic and related fields; I have learned and am still learning some other very important life skills, such as maintaining a good work/life balance, exploring my passions, building my professional network, managing my time, and, most importantly, understanding my own strengths and

weaknesses and working with those aspects of my personality. I believe this type of personal development comes from working in a positive, supportive and understanding environment.

My Typical Day
I usually start the day with administrative tasks, such as scheduling meetings or responding to emails; these tasks require excellent organisation skills and attention to detail. My work provides many opportunities for learning and development: the lectures and meetings I attend inform about developments in my field, and I enjoy tutoring other students and sharing my knowledge and experience with them. The bulk of my own PhD work is research and running experiments; only after I sufficiently understand the problem and how others in my field have tackled it, do I begin to plan my own approach. I relish the challenge of establishing a research questions, planning a method, and working towards a solution.

How important is problem solving in your role?
Many of my tasks I complete throughout the day require some level of problem-solving. Particularly as a computer scientist, much of my work revolves around taking complex and multifaceted problems and distilling them into simpler tasks. This technique is called divide-and-conquer and is particularly helpful when the problem at hand seems too complex to be solved at first glance.

What kinds of problems do you need to solve in your job on a day-to-day basis?
Some of the problems seem trivial, like how do I install this piece of software, or how do I locate a paper by a certain author. Other problems are more complex; for example, the question of how to automatically process MWEs in Irish. This complex issue actually incorporates several other tasks; such as research, coding, and linguistic analysis. I've found that regardless of whether the problem is simple or complex, the same problem-solving strategies can often be applied.

What is your favourite thing about your work?
I love the challenges presented by tacking a difficult research question and trying to discover something entirely new and unknown. I love to ask questions, and it's very gratifying to have the opportunity to answer them myself, particularly if nobody else can!

About me

What kind of puzzles/problems do you enjoy?
I've always enjoyed logic puzzles, abstract thinking and brain-teasers. For me, a career in computer science seemed a natural choice. I particularly enjoy the types of outside-the-box thinking required for creating a new piece of code, while also trying to work within the limitations of the language. Applying this logical and structured way of thinking to the very messy problems posed by language is fascinating and immensely satisfying to me.

What school subjects influenced your career path?
Choosing subjects to study at school was difficult, because I was interested in everything! My favourite subjects were maths, physics, technical graphics, music and English. Luckily my

course allowed me to study both science and languages, and I've continued to work in both fields to this day.

Who inspired you?
My supervisor, Teresa Lynn, has been a big inspiration to me, particularly when I was deciding what to do next after graduating. I was burned out and felt apprehensive about returning to academic work. She reignited my confidence, my passion for research and my interest in Irish.

Work/life balance
As a full-time student, my hours are very flexible. This allows me to dictate my own schedule and work when I am most productive (I prefer to work in the evening time). However, it can be difficult to maintain this balance. Some days I struggle to be productive, while other days I can overwork myself. Overall, I really enjoy the freedom and flexibility.

Your top tips?
NLP and other related fields are typically at an intersection of science and humanities. Computer science in particular is a creative subject that allows for some very interesting and diverse applications. It is ideal for people who are logical, inventive and enjoy solving problems. That said, I think the number one quality you can possess as a potential researcher is curiosity. Find an area that fascinates you and start asking questions. If nobody else knows answer, then maybe you should find out what it is.