

Linguistics Challenge

Instructions: You will compete in teams of three. You will be given 10 problems. Every 5 minutes, you may turn in a solution to exactly 1 problem. The round lasts a total of 50 minutes. You are allowed to turn in a new solution for a problem you have already submitted an answer for, in which case your old submission is discarded. Of course, in that case, you will not be able to turn in solutions for all 10 problems. The problems in this packet are arranged in order of increasing point value (ranging from 2.5 points to 24 points) and thus approximately in order of increasing difficulty.

Good luck!

Problem 1: Agta (2.5 points (0.5 points/answer))

The following list of words is from the Agta language of the Central Cagayan Valley in the Northern island of Luzon, in the Philippines. There are now only about 600 speakers of this variety of Agta, although there are perhaps 10,000 people in the Philippines who speak other varieties also known as Agta. The Agta people now speak an Austronesian language similar to other languages spoken in the Philippines. However, they are descended from the Melanesian people who were present in the Philippines before the Austronesian peoples arrived. The Agta language is now seriously endangered.

1. wer 'creek'
2. balabahuy 'little pig'
3. talobag 'beetle'
4. bakbakat 'granny'
5. palapirak 'little money'
6. bahuy 'pig'
7. bag 'loincloth'
8. walawer 'little creek'
9. balabag 'little loincloth'
10. takki 'leg'
11. labang 'patch'

Question. Translate the following words into Central Cagayan Agta:

- a. _____ 'little leg'
- b. _____ 'money'
- c. _____ 'little beetle' (or 'ladybug')
- d. _____ 'little patch'
- e. _____ 'little granny'

Team name: _____

Problem 2: Tokyo Japanese (4 points (1 point/answer))

Tokyo Japanese is a **pitch-accent** language, where at most one syllable in a word can have an “accent.” The “accent” is marked by ´ on the syllable, and is actually pronounced as a pitch fall. When two words are combined to form a compound, each word may come with an accented syllable, but the final compound can only have one accent. Here are some examples:

- (1) yudé + támago → yude-támago
“boil” “egg” “boiled egg”
- (2) dénki + kamisóri → denki-kámisori
“electric” “razor” “electric razor”
- (3) nárita + ekisupúresu → narita-ekisupúresu
Narita express “Narita (airport) express (train)”
- (4) yámato + nadésiko → yamato-nadésiko
“Japanese” “lady” “Japanese lady”
- (5) yumé + mákura → yume-mákura
“dream” “pillow” “pillow such that the person who sleeps on it is dreaming”
- (6) néko + musumé → neko-músume
“cat” “daughter” “catwoman”
- (7) shíro + asuparágasu → shiro-asuparágasu
“white” “asparagus” “white asparagus”
- (8) té + kagámi → te-kágami
“hand” “mirror” “hand mirror”

Question. Give the accented form of the following compounds:

- a. yaé + sákura → _____
“many” “cherry tree” “a fully-blooming cherry tree”
- b. kúmo + kakuré → _____
“cloud” “hide” “hidden behind a cloud”
- c. kúi + jidóusha → _____
“light” “car” “compact car”
- d. oó + kámakiri → _____
“big” “praying mantis” “large praying mantis”

Team name: _____

Problem 3: German (5 points (0.5 points/answer))

Below are some words from German, with the pronunciation of *ch* given on the right. (*x* is pronounced like *ch* in *Bach*; for *c*, imagine the sound made by a threatened cat.)

- | | | | |
|-----|----------|---|-------------------|
| 1. | Kuchen | x | “cake” |
| 2. | solchen | c | “such” |
| 3. | Strauch | x | “bush” |
| 4. | doch | x | “is too!” |
| 5. | Dolch | c | “dagger” |
| 6. | Becher | c | “cup” |
| 7. | brachte | x | “brought” |
| 8. | Kolchose | c | “collective farm” |
| 9. | Brechung | c | “refraction” |
| 10. | Bruch | x | “break” |
| 11. | Sicht | c | “view” |
| 12. | Richard | c | “Richard” |
| 13. | Sprache | x | “language” |
| 14. | Krach | x | “noise” |

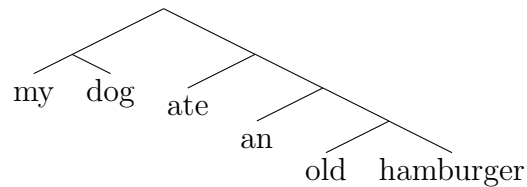
Question. How is *ch* pronounced in the following words?

- | | | | | | | | |
|----|-------|-------|-------------|----|---------|-------|-----------|
| a. | sechs | _____ | “six” | f. | Elch | _____ | “elk” |
| b. | Docht | _____ | “wick” | g. | Kelche | _____ | “goblets” |
| c. | Stich | _____ | “stab” | h. | Suche | _____ | “search” |
| d. | Sucht | _____ | “addiction” | i. | Pflicht | _____ | “duty” |
| e. | Ochse | _____ | “ox” | j. | sprach | _____ | “said” |

Team name: _____

Problem 4: Constituents (5 points)

In the formal study of sentence syntax, sentences are often represented as hierarchical **trees**. Here is a tree for the sentence (1) “my dog ate an old hamburger.”



Each vertex of a tree has either one word or two vertices below it. The tree above has 11 vertices.

Define a **subsentence** to be a continuous subset of words from a sentence.

Subsentences of (1) include, for example, “my dog ate an old hamburger,” “my dog ate,” and “old”. Strings which are not subsentences of (1) include “ate hamburger,” “old ham,” and “hot dog.”

Define a **constituent** to be a subsentence for which there is a vertex in the tree which contains (below it) that subsentence and no other words.

Constituents of (1) include, for example, “my dog,” “an old hamburger,” and “an.” Subsentences of (1) which are not constituents include “my dog ate” and “an old.”

Question. Suppose a non-null subsentence is chosen randomly from an N -word sentence. Compute in terms of N the probability that this subsentence is a constituent.

Team name: _____

Problem 5: Turkish (8 points (2 points/answer))

Turkish is spoken by about 60 million people in Turkey and surrounding countries. Below are some Turkish words, followed by their English translations. (The letter ζ represents a sounds similar to *ch* in *chop*.)

- | | | | |
|----------------|--------------------|-------------|------------|
| 1. kilimler | 'carpets' | 8. arabalar | 'cars' |
| 2. kilimde | 'in the carpet' | 9. deniz | 'ocean' |
| 3. deftere | 'to the notebook' | 10. masa | 'table' |
| 4. defterlerde | 'in the notebooks' | 11. ev | 'house' |
| 5. adamlara | 'to the men' | 12. havuç | 'carrot' |
| 6. taraflarda | 'in the sides' | 13. defter | 'notebook' |
| 7. okula | 'to the school' | | |

Question. Give the Turkish translations for the following:

- a. _____ 'in the ocean'
- b. _____ 'tables'
- c. _____ 'to the houses'
- d. _____ 'to the carrot'

Team name: _____

Problem 6: Maasai (10 points (1 point/answer))

Maasai is a language spoken by about 883,000 people in East Africa, mostly in Kenya and Tanzania. As with many languages in East Africa, *tone* is very important in Maasai. The different tones are written as marks above some letters. For example, the letters á, í and ó are all pronounced with high tone. The letters à, ì and ò are all pronounced with low tone. If there is no mark over a letter, it is pronounced with “mid tone”, half way in between high and low. The following are some sentences in Maasai, and the English translations **in random order**.

- | | |
|------------------------------|---|
| 1. éósh òlmòraní òlásuràì | A. ‘The warrior cuts me.’ |
| 2. áadól òlásuráí | B. ‘The warrior cuts the tree for me.’ |
| 3. áaósh òlmòraní | C. ‘The warrior cuts it.’ |
| 4. ídól òlmòránì | D. ‘I cut the tree for the warrior.’ |
| 5. íóshokí òlmòránì òlásuráì | E. ‘The warrior hits me.’ |
| 6. ádúyokí òlmòránì òlcetà | F. ‘You see the warrior.’ |
| 7. ádúy òlcetà | G. ‘The warrior hits the snake.’ |
| 8. áaduyokí òlmòraní òlcetà | H. ‘The snake sees me.’ |
| 9. áadúy òlmòraní | I. ‘You hit the snake for the warrior.’ |
| 10. édúy òlmòraní | J. ‘I cut the tree.’ |

Question. Indicate which translation goes with each Maasai sentence by placing the letter of the correct translation next to the corresponding number.

- | | |
|------------------------------|-------|
| 1. éósh òlmòraní òlásuràì | _____ |
| 2. áadól òlásuráí | _____ |
| 3. áaósh òlmòraní | _____ |
| 4. ídól òlmòránì | _____ |
| 5. íóshokí òlmòránì òlásuráì | _____ |
| 6. ádúyokí òlmòránì òlcetà | _____ |
| 7. ádúy òlcetà | _____ |
| 8. áaduyokí òlmòraní òlcetà | _____ |
| 9. áadúy òlmòraní | _____ |
| 10. édúy òlmòraní | _____ |

Team name: _____

Problem 7: Nahuatl (Aztec) (12 points (2 pts/answer))

Classical Nahuatl was the language of the Aztec Empire that flourished in what is now Mexico between 1325 and 1522 CE. It is an agglutinative language, meaning that one word can contain enough morphemes, or units of meaning, to convey the meaning of what would be a complex sentence in another language. Study the following Nahuatl/English pairs to figure out how each word should be divided into morphemes, and what each morpheme means. The colon (:) indicates that the preceding vowel should be pronounced long.

Nahuatl Word	English translation	Nahuatl Word	English translation
1. nicho:ka	'I cry.'	10. tikochi	'You sleep.'
2. nicho:kani	'I am crying.'	11. ancho:kah	'You (plural) cry.'
3. ankochinih	'You (plural) are sleeping.'	12. tikochis	'You will sleep.'
4. tikochih	'We sleep.'	13. ticho:kayah	'We were crying.'
5. kochiya	'He was sleeping.'	14. cho:ka	'He cries.'
6. kwi:kas	'He will sing.'	15. kochini	'He is sleeping.'
7. ankochiyah	'You (plural) were sleeping.'	16. ancho:kayah	'You (plural) were crying.'
8. nicho:kas	'I will cry.'	17. ticho:kanih	'We are crying.'
9. cho:kayah	'They were crying.'	18. kwi:kah	'They sing.'

Question 1. Translate the following Nahuatl words into English:

- a. tikwi:kani _____
- b. nikwi:kaya _____
- c. cho:kanih _____

Question 2. Translate the following English words into Nahuatl:

- a. 'They sleep.' _____
- b. 'I will sleep.' _____
- c. 'You will cry.' _____

Team name: _____

Problem 8: Niuean (15 points (3 points/answer))

Below are phrases written in Niuean (a Polynesian language spoken by approx. 8 thousand people) and their English translations.

1. To lele e manu. - A bird will fly.
2. Kua fano e tama. - A boy is walking.
3. Kua koukou a koe. - You are swimming.
4. Kua fano a ia. - He is walking.
5. Ne kitia he tama a Sione. - A boy saw John.
6. Kua kitia e koe a Pule. - You are seeing Pule.
7. To kitia e Sione a ia. - John will see him.
8. Ne liti e ia e kuli. - He abandoned a dog.
9. Kua kai he kuli e manu. - A dog is eating a bird.

Question. Translate the following sentences into Niuean.

- a. John swam. _____
- b. You will eat a dog. _____
- c. Pule is abandoning you. _____
- d. A bird will see a boy. _____
- e. A dog is flying. _____

Team name: _____

Problem 9: Hmong Daw (17 points (4pts/4pts/4pts/5pts))

Hmong Daw, a language from the Hmong Mien family, is spoken by approx. 165 thousand people in southeast China, Laos, Thailand, Vietnam, and a number of other countries. In the 1960s, Shong Lue Yang, a farmer from the Hmong Daw nation, created an original writing system for his native tongue. His writing is used to this day, along with a writing system based on the Latin alphabet that was developed by Christian missionaries. Some words and expressions from the Hmong Daw language are given below both in Shong Lue Yang's writing system, and in the system developed by the missionaries.

- | | | |
|------------------|--|----------------|
| 1. kev ntsuas no | | “degree” |
| 2. hauv | | “inside” |
| 3. raug raws cai | | “lawful” |
| 4. hloov mus | | “to transfer” |
| 5. qhua | | “guest” |
| 6. yog los nag | | “it's raining” |
| 7. kwv yees | | “grass” |
| 8. ris ceg luv | | “short pants” |

In the missionaries' writing system, the letter *w* stands for a vowel sound (similar to *i* in *tin*). The letters *g*, *s* and *v* do not stand for consonant sounds. Instead, they indicate *tones* (ways of pronouncing vowels).

Question. Write down the following words in the writing system of the missionaries.

- | | | | |
|----|--|-------|----------------------|
| a. | | _____ | “bird” |
| b. | | _____ | “lobster” |
| c. | | _____ | “to speak” |
| d. | | _____ | “prone to dizziness” |

Team name: _____

Problem 10: Egyptian Arabic (24 points (2 pts/cell))

The following are arithmetic equalities written in Egyptian Arabic. All summands, as well as all sums except the first two, are represented in fractions in which neither the numerators nor the denominators are greater than 10, nor is any denominator equal to 1 or 2. The fractions are not necessarily simplified, nor are they necessarily proper fractions.

$$xums + sub\bar{\iota}en = \frac{17}{35} \quad (1)$$

$$sub\bar{\iota}en + xums\bar{e}n = \frac{24}{35} \quad (2)$$

$$tum\bar{n} + tum\bar{n}en = talatt\ itm\bar{a}n \quad (3)$$

$$xamast\ ixm\bar{a}s + sub\bar{\iota} = tamant\ isb\bar{a}\bar{\iota} \quad (4)$$

$$tus\bar{\iota}en + tus\bar{\iota} = suds\bar{e}n \quad (5)$$

$$saba\bar{\iota}t\ itl\bar{a}t + suds = \bar{\iota}a\bar{s}art\ irb\bar{a}\bar{\iota} \quad (6)$$

(š is pronounced like English *sh*, *x* is pronounced like the *ch* in Scottish *loch*. $\bar{\iota}$ is an Arabic consonant not found in English. Vowels with a macron over them such as \bar{a} are pronounced long.)

Question. Fill in the following table. *Hint: Think about the consonants.*

n	1/n (singular)	1/n (plural)
3	<i>tult*</i>	
4		
5		
6		<i>isd\bar{a}s**</i>
7		
8		
9		
10	<i>\bar{\iota}u\bar{s}r</i>	<i>i\bar{\iota}\bar{s}\bar{a}r**</i>

* Meaning *one third*.

** Used in forms such as *five-sixths* or *eight-tenths*.

Team name: _____