

# Ninth International Olympiad in Linguistics

## Pittsburgh (United States of America), July 24–31, 2011

### Individual Contest Problems

**Problem #1 (20 points).** Given are verb forms of the Menominee language as well as their English translations:

<b>kewæpeqtaq</b>	we <sub>1+2</sub> begin
<b>kawāham</b>	he fells it by tool
<b>nepītohnæm</b>	I walk here (to this place)
<b>kēskenam</b>	he breaks it through by hand
<b>pahkæsam</b>	he cuts it off
<b>kekætohnæq</b>	we <sub>1+2</sub> walk out
<b>pītenam</b>	he passes it here
<b>kewæpānæhkæq</b>	we <sub>1+2</sub> begin to dig
<b>tawæsam</b>	he cuts a hole in it
<b>nekætahan</b>	I pry it out by tool
<b>pāhkaham</b>	he opens it by tool (by raising a lid or opening a door)
<b>kekēskahtæq</b>	we <sub>1+2</sub> bite it through
<b>wackōhnæw</b>	he walks roundabout, by a detour
<b>newāckesan</b>	I cut around it
<b>ketānam</b>	he takes it out by hand
<b>ketāwahtæq</b>	we <sub>1+2</sub> bite, gnaw a hole in it
<b>wæpohnæw</b>	he begins walking
<b>nekāweqtam</b>	I lie down
<b>pāhkeqtaw</b>	he opens up
<b>kepītahtæq</b>	we <sub>1+2</sub> come eating it; we <sub>1+2</sub> bring it in our mouths
<b>nekāwāhpem</b>	I fall over laughing

(a) Translate into English: **kekēskahæq**, **nepāhkenan**, **wæpāhpew**. If in some cases you believe that more than one translation is possible, give them all.

(b) Translate into Menominee:

- I begin to eat it
- we<sub>1+2</sub> lay it flat by hand
- he digs a hole
- he walks out

⚠ The Menominee Indians live in Wisconsin, USA. They number 5 000–10 000 people, but the eponymous language of the Algonquian family is only spoken by a few dozen of the oldest among them, although effort has been put lately into expanding its teaching and use.

“we<sub>1+2</sub>” = ‘we and you’. æ ≈ *a* in *crack*, **c** = *ch* in *church*, **q** is a consonant (the so-called glottal stop). The mark “~” denotes vowel length.

—Ivan Derzhanski

**Problem #2 (20 points).** The following are words of the Faroese language written in the regular orthography and in phonetic transcription as well as their English translations:

<i>bøga</i>	?	hen bird
<i>deyði</i>	[dɛiji]	(I) kill
<i>eyður</i>	[ɛijur]	wealth
<i>glaða</i>	[glɛava]	whirlwind
<i>gleða</i>	[glɛ:a]	(they) make glad
<i>gløður</i>	[glø:vur]	embers
<i>hugi</i>	[hu:wi]	mind
<i>knoðar</i>	?	(he) kneads
<i>koyla</i>	[kɔila]	cleft
<i>kvøða</i>	?	(they) sing
<i>lega</i>	[lɛ:va]	bed
<i>logi</i>	[lɔ:ji]	flame
<i>løgur</i>	?	liquid
<i>móða</i>	[mɔuwa]	froth or scum in pot with meat or fish
<i>mugu</i>	[mu:wu]	(they) must
<i>plága</i>	?	nuisance, affliction
<i>ráði</i>	[rɔaji]	(I) advise
<i>rúma</i>	[rɯma]	(they) contain
<i>røða</i>	[rø:a]	(they) speak
<i>skaði</i>	?	damage, loss
<i>skógur</i>	[skɔuwur]	forest
<i>spreiða</i>	[spraija]	(they) spread
<i>søga</i>	[sø:va]	story
<i>tegi</i>	[tɛ:ji]	keep silent!
<i>toygur</i>	?	swallow, gulp, draught
<i>tregar</i>	[trɛ:ar]	(he) injures
<i>trúgi</i>	?	may (he) endanger
<i>vágur</i>	[vɔavur]	gulf
<i>vegur</i>	[ve:vur]	(he) raises
<i>viður</i>	[vi:jur]	wood, timber
<i>viga</i>	[vi:ja]	(they) weigh
<i>øga</i>	[ø:a]	(they) frighten

(a) Fill in the gaps.

(b) Describe the rules you used.

⚠ Faroese belongs to the Northern subgroup of the Germanic languages. It is spoken by approx. 48 000 people in the Faroe Islands and elsewhere.

In the transcription [j] = *y* in *yum*, [w] = *w* in *win*; [ɛ], [ɔ], [ø], [ɞ] are vowels. The mark “:” denotes vowel length.  
—Alexander Piperski

**Problem #3 (20 points).** Given are phrases in the Vai language as well as their English translations:

kàíě á lèndéě	the man's vessel
kòánjà-lèṅě fā	the baby-eagle's father
gbòmùě á nyìmùě	the fish's snake
kàíě kàfā	the man's shoulder
nyìmù jǎṅě á gbòmù-lèndèě	the long snake's boat
mùsú jǎṅě lòò-kài	the tall woman's brother
nyìmù kúndúě já	the short snake's eye
kòánjà lòòě kènji	the small eagle's claw
kándò jǎṅě	the high sky

(a) Translate into English:

mùsúě á gbòmùě; léṅ kúndúě á nyìmùě; gbòmù-lèndè kúndúě.

(b) There is an error in the Vai phrase **kándò-lèndé lòòě**. Correct it and translate the phrase into English.

(c) Translate into Vai:

the eagle's snake; the small child's eye;  
the tall man's sister; the small baby-snake.

⚠ Vai belongs to the Central group of the Mande language family. It is spoken by approx. 105 000 people in Liberia and Sierra Leone.

**ny** and **ṅ** are consonants; **ε** and **ɔ** are vowels. The marks “ˊ”, “ˋ” and “ˊˊ” denote tones.

—Olga Kuznetsova

**Problem #4 (20 points).** Given are words in Nahuatl as well as their English translations in arbitrary order:

*acalhuah, achilli, atl, callah, calhuah, chilatl, chilli, colli, coltzintli, conehuah, conehuahcapil, conetl, oquichconetl, oquichhuah, oquichtotoltzintli, tehuah, tetlah, totoltetl*

water, child, master of house, water pepper, revered turkey-cock, mother, village, chili water, grandfather/ancestor, stony ground, boy, possessor of stones (= person who lives in a stony place), chili, turkey egg, canoe owner, mom(my), wife, revered grandfather/ancestor

(a) Determine the correct correspondences.

(b) Translate into Nahuatl: house, stone, possessor of water, revered man/husband.

(c) Translate into English: *cacahuatl, cacahuatetl, cacahuaatl, cacahuahuah*.

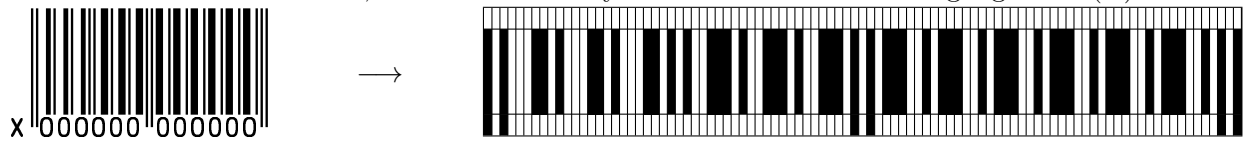
⚠ Classical Nahuatl was the language of the Aztec Empire in Mexico.

**c** = **qu** = **k**, **ch** = **ch** in *church*, **hu** = **w** in *win*, **tl** and **tz** are consonants.

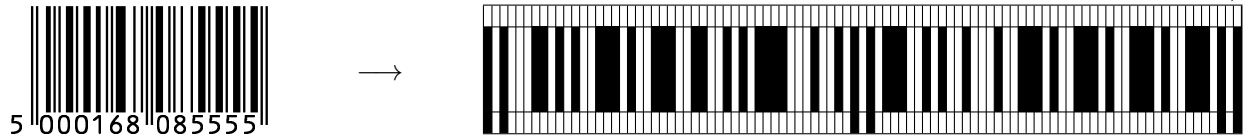
Water pepper (*Polygonum hydropiper*) is a wild plant. Chili water is a Aztec drink containing chili pepper.

—Liudmila Fedorova

**Problem #5 (20 points).** The barcode language EAN-13 (or GTIN-13) is used in almost every country in the world, yet nobody speaks it. It has 10 main dialects or subcodes, but this problem is not concerned with subcode zero, which is effectively the same as the older language UPC(A).



This is not a barcode: it belongs to a possible subcode of EAN-13 which is not in use. (On the right the machine-readable part of the code has been enlarged and transferred onto a grid for ease of observation.)



This is a barcode: it belongs to subcode 5. This barcode is from a packet of biscuits from the UK, and the number starts with the country code or system number for the UK, which is 50. Usually the first part of the code (5-000168) identifies the producer and the next part (08555) is chosen by the producer and identifies the product. The last digit is always a checksum.

Here are some more system numbers:

20–29	in-store functions	539	Ireland	84	Spain
30–37	France	64	Finland	978	ISBN (books)
40–44	Germany	73	Sweden	??	Norway

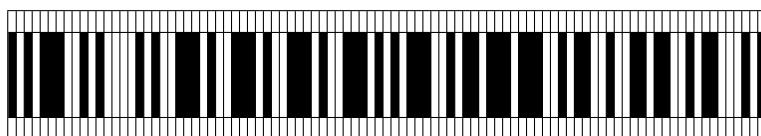
(a) Here are some facts about barcodes A–I, in no particular order. Give the letter of the barcode in each case, and answer any other questions:

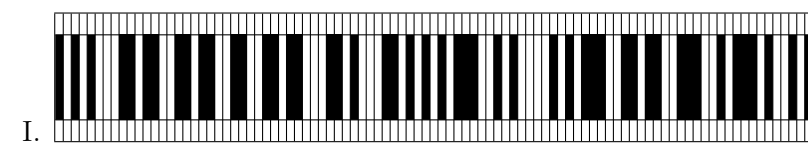
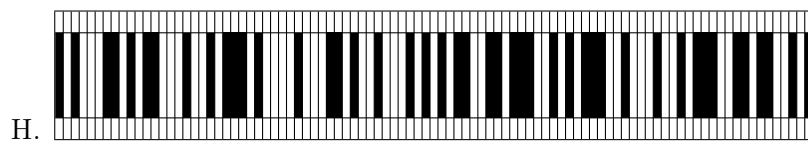
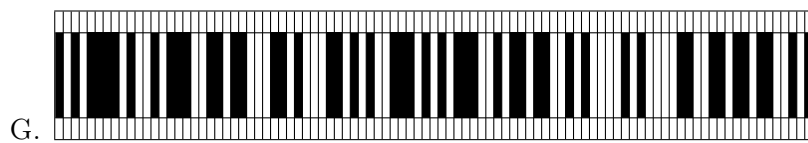
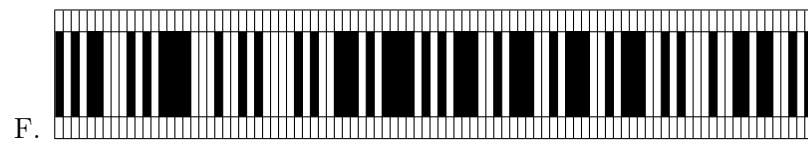
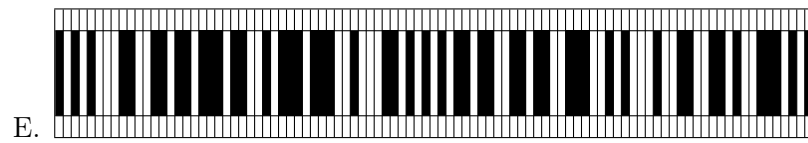
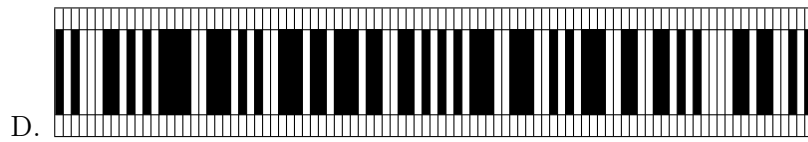
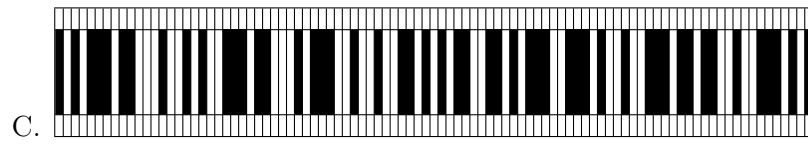
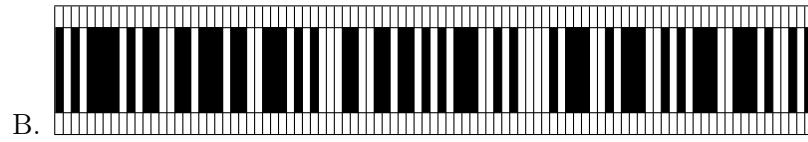
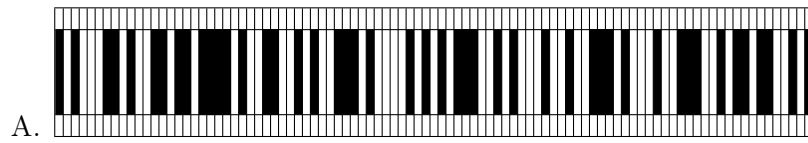
1. toilet paper (Spain) is barcode E;
2. smoked salmon (Ireland), product code = 02661, checksum = ?;
3. *The Lost Symbol* (ISBN book);
4. pork steak (packed in the store), cost = 4 euros and 16 cents;
5. mop head (from where?), full code = 4-023103-075702;
6. cholesterol-lowering spread (Finland);
7. sirloin steak (packed in the store), cost = ?;
8. *Korsordboken* (puzzle magazine, Sweden), full code = ?;
9. *Mots Codés* (puzzle magazine, France).

(b) Draw the (imaginary) barcode 1-453927-348790 in the grid that you will find on one of your sheets. Some of it has been filled in to help you.

(c) The barcode below is from *Dagbladet*, a newspaper from Norway. Write out the full code. What is the system number or country code for Norway?

—Hugh Dobbs





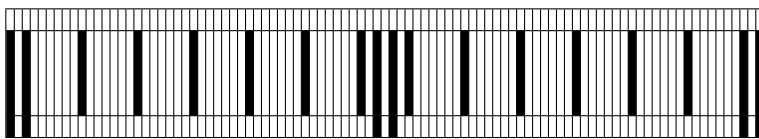
*Name:*

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*Problem #5*

*Sheet #*\_\_\_\_\_

(b)



If you need another copy of this sheet, ask the proctor.