

<A>The Heads and Tails of Huffman (10 points)

Task 1: Decode the following messages using the decoding tree shown above, without leaving a blank cell between letters (or words):

A. TTTTTTHHTTHTTTTHHTHTTTTHHTTHHTTHTTHT h e f e d b e e f

B. HTHTHHTTTHTTTHHTHTTTTHHTTHTTHTTHTT a c a g e d b e d

[0.3 for each correct letter] __/6

Task 2: The following English word from Deb is missing a coin somewhere in the middle. Mark the location and orientation (heads or tails) of the missing coin and decode the message.

TTTT-TTHH-A-THTT-TTHH-THTT	h	e	[a]	d	e	d
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[2.5] Of course full marks for just writing 'heded' above and writing 'headed' elsewhere or putting 'A' or 'a' above/under the position where it fits. I've added in A and [a] as one way of showing answer.

Location of the missing coin (counting from the left): **9** orientation: **H [1]**

Of course if one puts missing "H" in 7th or 8th place from left of line of coins one gets the same answer (no other solutions yield an English word) so we should allow for these as well.

Task 3:
MISSISSIPPI

Letter	Code			
I	H	TH	TH	H
M	TTT	TTT	TTH	TTH
P	TTH	TTH	TTT	TTT
S	TH	H	H	TH

Total number of coins: 21 [only need to get this answer for full marks, i.e., "21"] 2.5

Above codes are all possible optimal ones, and there are others. (Using first solution: TTT-H-TH-TH-H-TH-TH-H-TTH-TTH-H)

ABRACADABRA

Letter	Code		
A	H	H	H
B	TH	TTH	TH
C	TTTH	TTTT	TTTT
D	TTTT	TTTH	TTTH
R	TTH	TH	TTH

Total number of coins: 23 [only need to get this answer for full marks, i.e., "23"] 3
(Using first solution: H-TH-TTH-H-TTTH-H-TTTT-H-TH-TTH-H)

Yesbot (15 points)

Task 1: Give an example of a sentence that, when said by the CEO, will cause Yesbot to make a mistake. [Any example that works gets 3 points] ___/3

CEO: "I am the CEO of Yesbot Enterprises."

YESBOT: "YES, sir or ma'am, it is true that I am the CEO of Yesbot Enterprises."

[Any example with indexicals like I/2 person pronouns, or 'here/there', 'now','tense' can cause Y to make a mistake.]

Task 2: Provide two examples of words that, when the CEO uses them in a sentence, will sometimes cause Yesbot to make a mistake, but sometimes won't. Explain why.

[1 point for each of 2 words, 2 pts for adequate explanation for each word] ___/6

"You" will sometimes cause an error – whenever the CEO is addressing Yesbot, for example – but not when the CEO and Yesbot are both talking to a third person. "We" will sometimes cause an error – such as when the CEO is speaking for a group that excludes Yesbot, like "We are not robots" – but not when speaking for a group that includes Yesbot, like "We are in this room." Words like "now" and "here" may or may not cause errors depending on what time or location they pick out. "Now the CEO is talking" will cause an error, but "It's 2013 now" will not; likewise "Here are the reports" may cause an error if the CEO is holding them and Yesbot is across the room, but "There is a restaurant here" may not.

[Each of these words is what is called an "indexical/deictic"; they can refer to different things depending on who says them, who/what/where is referred to when.]

Task 3: Can you list any words that will *always* cause Yesbot to make a mistake, any time the CEO uses them? No Explain.

[6 points for answer along lines of this answer] ___/6

There are no words that Yesbot will invariably get wrong, because the troublesome words (I, you, we, now, here, etc.) sometimes have fixed references, like in "reported speech" sentences where I am describing what someone else said.

Even the very problematic "I" gives no trouble to Yesbot if the CEO is reporting something someone said: "George from accounting said, 'I promise you that I'll never do it again.'" "I" and "you" in this sentence refer to the same people regardless; when Yesbot repeats it "I" it still refers to George.

<C> A Little Dutch Problem (20 points)

Task 1: Give the rules which determine the choice of a diminutive suffix in Dutch, by completing the sentences (a. to f.) below. Following "if" you need to state the conditions which determine the choice of diminutive form. The first one is done for you as an example. [HINT: in some cases a particular diminutive form is used under more than one condition. Your rule will have the form: "... if X or Y or Z", where X, Y, Z stand for each of the conditions.] ___/9

a.	double the final consonant and add-etje if <u>one syllable word ends in m, n, r or l following a short vowel</u>
b.	add -etje if word ends in ng [1 pt]
c.	add -tje if word ends in n, r or l preceded by/following a long vowel, or ends in a vowel, or ends in an unstressed syllable [6pts]
d.	add -pje if word ends in m preceded by/following a long vowel, or consonant [2pts]

Task 2: What suffix (ending) is added if none of the above rules (a-d) apply? -je ___/1

Task 3: Under what condition is -s added to the diminutive suffix? Answer by completing this sentence:

Add -s to the suffix if **word is an adverb/ is not a noun/word does not refer to a person or thing** ___/2

Task 4: There is one word in the list which is an exception to the rules, and another which seems to have a rule of its own.

(a) Which is the exceptional word, and what would you have expected the diminutive form to be? ___/1

Word: **bloem [0.5pt]** Expected diminutive: **bloempje [0.5 pt]**

(b) Which word has a rule of its own, and can you think of a plausible explanation for that rule? ___/3

Word: **koning [1 pt]**

Why: _____ [2pts distributed as below]

koning should be **koningetje** (rule b) or **koningtje** (rule c) but is instead **koninkje** and is exceptional because it is the only word to change a letter in the stem. [1pt for an explanation of what this exceptional rule is]

Rule b perhaps doesn't apply to polysyllabic words (words of more than one syllable) where the final syllable is not stressed.

Rule c may not apply because "ngtj" is too complex a consonant cluster/sequence of consonants/too many consonants.

[Either explanation for why this word has its own rule would be worth 1 pt]

(Actually the real reason is historical: the word was originally "konink", but the students can't be expected to guess/know this).

Task 5: On the basis of the rules determining how diminutives are formed that you have worked out by analysing the words on the previous page, write the diminutive form of each of the following words. [0.5 pt each 1 x 0.5] /4

kan	'jug'	kannetje	moeder	'mother'	moedertje
kar	'cart'	karretje	riem	'strap'	riempje
kwart	'quarter'	kwartje	stil	'quietly'	stilletjes
la	'drawer'	latje	tafel	'table'	tafeltje

<D> Stockholm's Tunnelbana (20points)

Task: Using the map, put the appropriate station number next to its English translation. ___/20

0.5 for each correct number (0.5 x 40)

Abraham's Mountain	29 Abrahamsberg	John's Grove	21 Johannelund
Alder Bay	31 Alvik	King's Garden	1 Kungsträdgården
Alder Village	70 Alby	Lake Mälaren Heights	78 Mälarhöjden
Axel's Mountain	79 Axelsberg	Manor	76 Sättra
Band Pasture	50 Bandhagen	Mary Market	90 Mariatorget
Birch Pasture	64 Björkhagen	Meadow Village Square	26 Ängbyplan
Channel Village	7 Sundbybergs centrum	Mount Christine	32 Kristineberg
Mountain Centre			
Charles Square	92 Karlaplan	Mountain Hammer	98 Bergshamra
Dark Mountain	24 Blackeberg	Odin Square	36 Odenplan
Fathertown	61 Farsta	Rink Village	10 Rinkeby
Fathertown Beach	62 Farsta strand	Spring Mountain	74 Vårberg
Forest Church Garden	57 Skogskyrkogården	Spring Village Farm	73 Vårby gard
Pasture Manor	53 Hagsättra	St Eric's Square	35 S:t Eriksplan
Gullmar's Square	44 Gullmarsplan	Sture Village	49 Stureby
Hall Grove	69 Hallunda	Telephone Square	84 Telefonplan
Hammer Village Heights	63 Hammarbyhöjden	Tender Village Center	100 Mörby centrum
Haymarket	38 Hötorget	Thorild's Square	33 Thorildsplan
Hazel Village Beach	19 Hässelby strand	Town Pasture	3 Stadshagen
Hazel Village Farm	20 Hässelby gård	Western Cottage	86 Västertorp
House Village	17 Husby	Westwood	4 Västra skogen
Iceland Market	25 Islandstorget		

<E> Being Beja (20 points)**Table 1: Nouns**

	a X	the X	(some/any) X
bride		tidooba (s)	
bridegroom	doobaab (o)		
calf (male)		ilaga (s)	
calf (female)		tilaga (s)	
camel (male)		ookaam (o)	
camel (female)		tuukaam (s)	
dog (male)		uuyaas (s)	
donkey (male)		oomeek (o) uumeek (s)	
flower		oofaar (o)	m'ariit (o)
food		tim'ari (o)	
horse	hataay (o)		
leg		iragad (s)	
man		uutak (s) ootak (o)	
mouse	gwibu		
ox		ooyoo (o)	
oxen			yooaab
shell	kil'oob (o)		
water			yam (o)

Table 2: verbs

	VERBs	is VERBing	VERBED	has VERBED	did not VERB	is not VERBing	can VERB	cannot VERB
collect		danbiil (m)	tidbil (f)		diblaab kiike (m)	kitdibil (f) kitdibil (f)	danbiilu (m)	
eat			tamya(m)	tamaabu (m)		katamya (m)	tamtiniitu (f)	tamtiniit kitte (f)
lie		b'iini (m)	b'ata (f)					
meet							kanriifu (m)	
see	rhitni (f)		rhita (f)	rhaabu (m)				rhitniit kitte (f)
sleep		diwiini(m)				kadiwta (f)		

Task 1: Translate the following Beja sentences into English.

___/10

1	uukaam ootak rhaabu.	The camel has seen the man.
2	faar katamya.	He is not eating/does not eat a flower.
3	hataay tamtiniitu.	She can eat a horse.
4	uutak yam danbiilu.	The man can collect water.
5	meek rhitniit kitte.	She cannot see a donkey.

Ignoring fullstops, 2 points each correct sentence. 1 pt for correct verb (including auxiliary); 1pt for correct NP(s) including he or she

Task 2: Translate the following English sentences into Beja, paying attention to the correct form of the Beja words and to the correct word order.

___/10

6	A man meets the mouse.	Tak oogwib(u) kanriif.
7	The bridegroom is not eating.	Idooba katamya.
8	The donkey did not eat the flower.	Uumeek oofaar tamaab kiike.
9	The mouse is not big.	Uugwib(u) win(u) kiike.
10	The female dog cannot collect oxen.	Tuuyaas yooaab danbiilt kitte.

2 pts for each correct Beja sentence (ignoring fullstops). Correct word forms & correct word order (SOV) to get full marks. 1pt off if correct word forms but wrong word order. 1 pt for correct verb form (most difficult part of task I think) and divide other point for correct NPs.

I think we should allow final -u on 'mouse' words because not enough data to see this as sfx.

Here is more info on Beja grammar from Dick Hudson (UKLO) who contributed this problem

1. gender: masculine (no t: -y, e.g. tamyā; -b, e.g. tamaabu) vs feminine (t-/t, e.g. tilaga, rhitni, tidbil; tilaga wint kitte).
2. case: nominative/subjective (prefix = uu, e.g. uutak, tuukaam, uumeek) vs accusative/objective (prefix = oo, e.g. ootak, oomeek, oofaar); neutralized to i before two or more syllables.
3. definiteness: indefinite (no prefix, e.g. yooaab, doobaab) vs definite (uu/oo/i-, e.g. ooyoo, tidooba,)
 - a. Also suffix -b marks masculine accusative/objective indefinite (e.g. yoob, kil'oob)
4. person/number/tense: some verbs take suffixes (e.g. diwiini, kadiwta), others take prefixes and infixes (e.g. tidbil, danbiil)
5. past participle: suffix -aa for all verbs (e.g. tamaabu, diblaab)
6. negative: marked by prefix ka- + suffixing verb, or k- + prefixing verb.
7. negative present: k(a) + **past** tense [odd!]
8. 'be'/copula: suffix -u (e.g. gwibu, winu)
 - a. added to accusative/objective (e.g. tamaabu)
9. negative 'be': negative iike/itte (e.g. k-iike/k-itte)
10. perfect/has done: past participle + 'be' (e.g. tamaabu, diblaab kiike)
11. 'can': present, treated as an adjective so add t for feminine + 'be' (e.g. kanriifu, tamtiniit kitte)
12. word order: subject/nominative + object/accusative + verb/'be' suffix

