

ภาคผนวก

แบบฝึกหัดสำหรับบทที่ 5 : การวิเคราะห์หน่วยเสียง

ตัวอย่าง การหาหน่วยเสียงตามหลักการเทียบคู่โดยใช้คู่เทียบเสียง (minimal pair)

Problem A: Tabascan Chontal (Mexico)

Prove that [i] and [u] are separate phonemes.

1. sis	cold	5. iim	corn
2. ิอิ	bad	6. sum	rope
3. san	dried palm	7. ิอิ	corn meal
4. sami	earlier today		

การแก้ปัญหา

คู่เทียบเสียง [i] และ [u]

เพราะฉะนั้น /u/ และ /i/ ต่างก็เป็นหน่วยเสียงตามหลักการเทียบคู่

Problem 1: Mazateco (Mexico)

Prove that nasalized vowels and oral vowels are separate phonemes.

1. naŋi	cliff	5. naŋa	salt
2. su	sour	6. ิอิ	loose
3. ta	hand	7. ิอิอิ	married
4. tasa	cup	8. ิอิ	lion

Problem 2: Zinza

Prove that high tone ['] and low tone unmarked are phonemic.

1. ku'oba	to become wet	4. obukó:mbe	wedding feast
2. tuka'bwa	we forgot	5. obukombe	thunderstorm
3. tuka'owa	we were stolen from	6. ku'oba	to fish by line

Problem 3: Oaxacan Chontal (Mexico)

Prove that [ɣ] and [s], [k] and [x], [t] and [t̥], [e] and [ẽ], [u] and [ũ], [a] and [ã] are separate phonemes.

1. ku'ɣax	needle	8. tɛpa	I bit
2. paɣxa	he is able	9. tsɛpa	I sifted
3. epa	sugar cane	10. axaʔ	water
4. saxpa	I ate	11. ɣa'seta	he is going for a walk
5. ɣɛpa	he bit	12. paɣxã	slowly
6. ku'ɣax	bitter	13. ɣɛ'pa	he went away
7. tsɛ'pa	I went away	14. akaʔ	bird

Problem 4: Badaga

Prove that [e·] is phonemically distinct from retroflex [ɐ̣], [a] from [ạ].

- | | | | |
|----------|--------|----------|---------------|
| 1. be· | mouth | 4. kat'e | I learned |
| 2. kat'e | ass | 5. to·gu | wash it! |
| 3. be· | bangle | 6. to·gō | plural of to· |

Problem 5: Tojolabal (Mexico)

Prove that [k] and [k'] are separate phonemes.

- | | | | |
|-----------|-------------------|-------------|--------------|
| 1. kisim | my beard | 8. čak'a | chop it down |
| 2. kōktik | our feet | 9. k'ak | flea |
| 3. p'akan | hanging | 10. k'a'em | sugar cane |
| 4. sak | white | 11. k'išin | warm |
| 5. skučū | he is carrying it | 12. k'uutes | to dress |
| 6. snika | he stirred it | 13. ʔak' | reed |
| 7. kak | my grass | | |

ตัวอย่าง การหาหน่วยเสียงตามหลักการเทียบคู่โดยใช้คู่เทียบคล้าย

Problem B: ใช้ปัญหาที่ 5 เป็นตัวอย่าง แต่ตัดคำ kak 'my grass' ออก

การแก้ปัญหา

คู่เทียบคล้าย [k'ak] และ [ʔak']

เพราะฉะนั้น /k/ และ /k'/ เป็นคนละหน่วยเสียงตามหลักการเทียบคู่

Problem 6: Venda (South Africa)

Are [ɲ n] allophones of one phoneme? State your evidence.

/ɲ/ is a strongly labialized fricative in contrast with /z/.

- | [ɲ] dental | | [n] alveolar | |
|------------|---------------|--------------|-----------|
| 1. baɲu | at your place | 7. ene | he |
| 2. liɲo | tooth | 8. hana | childhood |
| 3. muɲe | master | 9. khouno | there |
| 4. ɲari | buffalo | 10. ʔatanu | five |
| 5. pʰeɲe | baboon | 11. ʔonanl | see! |
| 6. ʔaɲa | four | 12. zɲo | now |

Problem 7: Hypothetical Language

Prove that /f/ and /v/ are separate phonemes.

- | | | | |
|----------|-------|------------|--------|
| 1. mafsa | whale | 3. tasa | walrus |
| 2. mavma | house | 4. katavsa | garden |

ตัวอย่าง การหาหน่วยเสียงตามหลักการทักดัด

Problem C: Tojolabal (Mexico)

Define the distribution of [t] and [tʰ] that they are in complementary distribution and form one phoneme.

1. čitam	pig	5. čatath	kind of plant
2. makton	a patch	6. muth	chicken
3. potot'	kind of plant	7. nahath	long
4. tinan	upside down	8. 'inath	seed

การแก้ปัญหา

[t] occurs initially or medially.

[tʰ] occurs finally.

[t] and [tʰ] are in complementary distribution and form one phoneme.

Problem D: Oaxacan Chontal (Mexico)

State reasons for proving that [ŋ] and [ŋ̚] are one phoneme.

1. moygiʔ	tomorrow	10. panguy	he lives
2. liβiβa	his grand mother	11. funguy	she grows fat
3. waβuy	he carries	12. enteβa	liver
4. gaʔa	that	13. taʔa	thick
5. kanduy	he leaves	14. goʔ	heron
6. inxa	wild boar	15. čin̄	quiet
7. paʔuy	she washes	16. faβayʔ	they sow
8. apando	lame	17. bamaʔ	ten
9. toʔuy	I grow	18. nana	mother

การแก้ปัญหา

[ŋ] occurs before a velar consonant or at final.

[ŋ̚] occurs elsewhere.

Thus [ŋ] and [ŋ̚] are in complementary distribution and form one phoneme.

Problem 8: Aztec (Mexico)

[f], [β], [W], and [w] are allophones of a single phoneme. State their distribution.

1. ifiti	feast	6. watsinko	tomorrow
2. iwa	and	7. βieβeitsi	biggish
3. βeyak	long	8. teusiβi	hungry
4. βehfeyi	big	9. tehWɔ	we
5. iyotWa	yesterday	10. mitsfika	he takes you

Problem 9: Popoluca (Mexico)

State the distribution of [m] and [M], [n] and [N], [ɲ] and [Ñ], [ŋ] and [Ņ].

1. paŋə	put in the ground	7. yo·mo	woman
2. noŋ	flat	8. nəts	armadillo
3. hoN	bird	9. tsa·Ñ	snake
4. wo·ŋi	little girl	10. tsa·M	very
5. anəkpa	I go	11. antəkma	my country
6. mok	corn	12. ŋi·wi	chill

Problem 10: Korean

[l ɾ] are in complementary distribution and form one phoneme. State the distribution.

/u/ is a high back unrounded vowel.

1. kal	that'll go	12. silkwa	fruit
2. kuŋəl	shade	13. tuɫʰaŋ	window
3. mul	water	14. əlmana	how much
4. pal	leg	15. iɾəmi	name
5. pʰal	arm	16. kiɾi	road
6. səul	Seoul	17. kuɾəm	then
7. tatəl	all of them	18. kuɾiɾo	to the street
8. ilkop	seven	19. saɾam	person
9. ipalsa	barber	20. uɾi	we
10. onəlppam	tonight	21. yəɾəm	summer
11. pulpʰyən	discomfort		

Problem 11: Swahili (East Africa)

[ɔ o] are in complementary distribution and form one phoneme. State the distribution.

Forms marked * contain both allophones.

1. ŋɔma	drum	12. watoto	children
2. bɔma	fort	13. ndoto	dream
3. ŋɔmbe	cattle	14. mboga	vegetable
4. bɔmba	pipe	15. ndogo	little
5. ɔmba	pray	16. ʝogo	rooster
6. ɔna	see	17. ʃoka	axe
7. pɔlla	cure	18. okota	pick up
8. ʃɔlla	nurse	19. moɔja	one
9. ɔɾja	taste	20. mtego	trap
10. ɔŋgeza	increase	21. kʰɔndɔ	*sheep
11. ɾɔŋga	strangle	22. karɔŋgo	*wash-out

Problem 12: Zulu (South Africa)

[ɔ o] are in complementary distribution and form one phoneme. State the distribution.

/c q x/ are clicks. /b/ is a voiced bilabial implosive stop.

1. ɓona	see	13. iboni	grasshopper
2. ɓopha	bind	14. umondli	guardian
3. mɔsa	despoil	15. umosi	one who roasts
4. umɔna	jealousy	16. inoni	fat
5. imɔɔ	car	17. udoli	doll
6. iqɔɔ	small of back	18. umxoxi	story-teller
7. ixɔɔ	frog	19. imomfu	jersey cow
8. isicɔɔ	head ring	20. lolu	this
9. ibɔdwe	pot	21. isitofu	stove
10. isithɔmbe	picture	22. nomuthi	and the tree
11. indɔdana	son	23. udodile	you acted like a man
12. umfɔkazi	strange man	24. ibokisi	box

Problem 13: Karok (California)

The difference between long and short consonants is not phonemic. State the distribution.

Long consonants and vowels are marked by a following -

1. θúk'in	bile	6. ɕaná'kat	mosquito
2. ʔípat	doe	7. ʔa'pun	on the ground
3. ʔáɕ'akiɕ	puppy	8. ʔá'ɕip	middle
4. yúfi	nose	9. pú'fiɕ	deer
5. ʔás'ar	wet	10. ʔá'si	cave

Problem 14: Keresan (New Mexico)

[ɕ ʃ] are in complementary distribution and form one phoneme. State the distribution.

It will be necessary to describe four environments, two for each allophone. Forms marked * contain both allophones. /' / marks stress.

1. hanáiyéñ	it is dangerous	13. na'ʃúwím	moccasin
2. ma'íaw	vulture	14. ʃá'wit	parrot
3. múleɕ	*bison	15. ʃé'	and it was
4. siyúɕíuɕ	*be not afraid	16. ʃú'w	serpent
5. ɕa'ák	pipe	17. ʃú'watʔaʔw	witch doctor
6. wí'íuñ	face	18. yawʃá't	sand
7. hi'íkáy	knife	19. ha'stiɕáɕ	*seat

8. kánašk	his head	20. he'ya'ʔaš	mist
9. ma'ʔašt	fox	21. ka'ʔašt	fished
10. špó'n	water bottle	22. kúca-mašt	he buried it
11. yú-špiñ	shoulder	23. styú'čsušt	*I'll not be afraid
12. ʔištú'ʔ	arrow	24. to'mišt	cloth

Problem 15: Korean

[s ɬ z] are in complementary distribution and form one phoneme. State the distribution. Items marked with * contain two allophones.

1. satan	division	12. šiktan	dining room
2. sæk	color	13. šisu	*mistake
3. sæ	new	14. šinpu	bride
4. sosəl	novel	15. čanza	business
5. su	number	16. inza	greetings
6. sul	wine	17. inzweča	publisher
7. susul	operation	18. pagzək	cushion
8. šeke	world	19. phuqzok	custom
9. šekəm	taxes	20. ɐmzikčəm	restaurant
10. šəušiil	*washroom	21. yaqzucən	receipt
11. šihap	game		

Problem 16: Totonac (Mexico)

Voiceless vowels [j ɤ ɥ] are in complementary distribution with voiced vowels [i a u] and form three phonemes /i a u/. State the distribution.

1. capəɤ	he stacks	7. snapapɤ	white
2. cilinksa	it resounded	8. stapɥ	beans
3. kasitti	cut it	9. šumpj	porcupine
4. kuku	uncle	10. taəqɥ	you plunged it.
5. ʔkaka	peppery	11. tihašij	he rested
6. miki	snow	12. tukšij	it broke

Problem 17: Persian

[ʔ ɣ ʕ] are in complementary distribution and form one phoneme. State the distribution. Forms marked with * contain two allophones.

[ʔ] voiced trill		[ɣ] voiced flap		[ʕ] voiceless trill	
1. əʔtəs	army	9. ahaʔi	starched	17. ahaʕ	starch
2. faʔsi	Persian	10. bəʔadəʔ	*brother	18. axəʕ	last
3. qədʔi	a little bit	11. bəʔid	gol	19. ənaʕ	pomegranate
4. ʔah	road	12. biʔəŋ	pale	20. behtaʕ	better

5. řást	right	13. bořós	hairbrush	21. čář	four
6. řæng	paint	14. čěřa	why?	22. čěřuř	what kind?
7. řiš	beard	15. daříd	you have	23. hěřtowř	*however
8. řúz	day	16. řiřiní	pastry	24. řiř	lion

Problem 18: Ganda (East Africa)

[l ɾ] are in complementary distribution and form one phoneme. State the distribution. Forms marked * contain both allophones. /' / marks high pitch. /` / marks low pitch. /dɻ/ is an alveopalatal stop. Doubled vowels are long.

1. òkúɖɖúɓà	to be full of	11. éřířimbí	a whistle
2. òkúɖɖúɓá	to dish up	12. éřɖáířířò	*beam
3. òkúgúá	to buy	13. éříná	name
4. òkúggúá	to open	14. éttúúndíró	shop
5. òkúlééà	to bring	15. myéřéřè	only
6. òkútábááà	to attack	16. ñɖáíří	Gospel
7. òmùlálà	mad man	17. òkúlířà	*to eat with
8. òmùléà	lame person	18. ólúgèró	*story
9. náálwááná	fought	19. ókúmířá	to swallow
10. túlègà	we tighten	20. pířípíří	pepper

Problem 19: Karok (California)

Are [a ə] allophones of one phoneme? State your evidence. /' / is a combination of strong stress and high pitch. Unmarked vowels have strong stress and low pitch.

1. ʔátraːx	arm	5. ʔəçnaːt	rat
2. tátač	mama	6. ʔáxək	two
3. sářə	bread	7. ʔásəř	wet
4. čənáːk	mosquito	8. tənukyáːnəř	shovel

↑
↓
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แบบฝึกหัดสำหรับบทที่ 13 : หน่วยคำและหลักการหาหน่วยคำ

ตัวอย่าง การหาหน่วยคำตามเกณฑ์ที่ว่า คำหรือส่วนของคำใดที่มีความหมายเหมือนกัน มีรูปเหมือนกัน ย่อมเป็นหน่วยคำเดียวกัน

Problem A: Tetelcingo Aztec (Mexico)

Identify the pronominal morphemes.

1. nibeci	I fall	5. nitlak ^w a	I eat
2. tibeci	you fall	6. titlak ^w a	you eat
3. nikoči	I sleep	7. ničuka	I cry
4. tikoci	you sleep	8. tičuka	you cry

การแก้ปัญหา

ni I ti you

Problem 1: Isthmus Aztec (Mexico)

Identify the plural and future morphemes.

1. patani	he flies	9. kimaga	he hits it
2. pina ^w a	he is ashamed	10. kimagah	they hit it
3. wecka	he laughs	11. patanis	he will fly
4. patanib	they fly	12. pina ^w as	he will be ashamed
5. weckah	they laugh	13. koniash	they will drink it
6. konia	he drinks it	14. kiknelia	he pities him
7. koniah	they drink it	15. kikneliah	they pity him
8. weckas	he will laugh	16. pina ^w wah	they are ashamed

Problem 2: Choctaw (Oklahoma)

Identify all the morphemes.

1. pialitok	I saw	8. išpayatok	you called
2. išsapisači	you will see me	9. čipayaliči	I will call you
3. čipisali	I see you	10. išsapaya	you call me
4. išsaso	you hit me (pres)	11. čakmaneliči	I will like
5. čisoli	I hit you (pres)	12. čičakmanelitok	I liked you
6. išsotok	you hit (past)	13. išsačakmane	you like me
7. soliči	I will hit	14. išpisa	you see

Problem 3: Kanuri (Nigeria)

What type of affix is shown? What is its form and approximate meaning?

Given /kəji/ 'sweet', what is a likely form for 'sweetness'?

Given /nəmgəla/ 'goodness', what is a likely form for 'good'?

1. gaa	small	1a. nəmgana	smallness
2. kura	big	2a. nəmkura	bigness
3. kurugu	long	3a. nəmkurugu	length
4. karite	excellent	4a. nəmkarite	excellence
5. dibi	bad	5a. nəmdibi	badness

Problem 4: Ganda (Uganda)

What type of affixes is shown? What are their forms and approximate meanings?

Given /abalongo/ 'twins', what is a likely form for 'twin'?

1. omukazi	woman	1a. abakazi	women
2. omusawo	doctor	2a. abasawo	doctors
3. omusika	heir	3a. abasika	heirs
4. omuwala	girl	4a. abawala	girls
5. omulenzi	boy	5a. abalenzi	boys

Problem 5: Bontoc (Philippine Islands)

What type of affix is used to form the verb? Describe its form and relationship to the stem.

Given /pusi/ 'poor', what would be the most likely meaning of /pumusi/?

Given /ŋitad/ 'dark', what would be the most likely form meaning 'he is becoming dark'?

Given /pumukaw/ 'he is becoming white', what is the most likely form meaning 'white'?

1. fikas	strong	1a. fumikas	he is becoming strong
2. kilad	red	2a. kumilad	he is becoming red
3. bato	stone	3a. bumato	he is becoming stone
4. fusul	enemy	4a. fumusul	he is becoming an enemy

Problem 6: Samoan (The Pacific)

What type of affix is used to make the form of the verb used with a plural subject? Describe its form and relationship to the stem.

Given /galue/ '(he) works', what would be the most likely form with a plural subject?

Given /alolofa/ '(they) love', what would be the most likely form with a singular subject?

1. manao	(he) wishes	1a. mananao	(they) wish
2. matua	(he) is old	2a. matutua	(they) are old
3. malosi	(he) is strong	3a. malolosi	(they) are strong
4. punou	(he) bends	4a. punonou	(they) bend
5. savali	(he) travels	5a. savavali	(they) travel
6. pese	(he) sings	6a. pepese	(they) sing
7. laga	(he) weaves	7a. lalaga	(they) weave
8. atama?i	(he) is wise	8a. atamama?i	(they) are wise

ตัวอย่าง การหาหน่วยคำตามเกณฑ์ที่ว่า คำ หรือส่วนของคำใดที่มีความหมายเหมือนกัน แต่มีรูปต่างกัน ถ้าสามารถใช้ลักษณะบังคับทางเสียงมาเป็นเกณฑ์พิสูจน์ได้ หน่วยย่อยของคำนั้นก็จะเป็นหน่วยคำเดียวกัน

Problem B: Cocama (Peru)

Identify the possessive adjective morphemes and state their distribution.

1. iwa	arm	1a. tiwa	my arm	1b. niwa	your arm
2. ia	heart	2a. tia	my heart	2b. nia	your heart
3. dakɨ	head	3a. tiakɨ	my head	3b. niakɨ	your head
4. ti	nose	4a. tati	my nose	4b. nati	your nose
5. ka	farm	5a. taka	my farm	5b. naka	your farm
6. dawidi	yucca	6a. tiawidi	my yucca	6b. niawidi	your yucca
7. pua	hand	7a. tupua	my hand	7b. napua	your hand
8. uka	house	8a. tuka	my house	8b. nuka	your house

การแก้ปัญห

- {t-} occurs before a stem with vowel initial.
- {ti-} occurs before a stem beginning with /d/ and /d/ is deleted.
- {ta-} occurs before a stem beginning with a voiceless consonant except /p/.
- {tu-} occurs before a stem beginning with /p/.
- {t-→ti-→ta-→tu-} are allomorphs of a single morpheme meaning 'my.'
- {n-} occurs before a stem with vowel initial.
- {ni-} occurs before a stem beginning with /d/ and /d/ is deleted.
- {na-} occurs before a stem beginning with a voiceless consonant.
- {n-→ni-→na-} are allomorphs of the same morpheme meaning 'your.'

Problem C: English

Prove that {im-→in-→i-} are allomorphs of the same morpheme.

- | | | | |
|---------------|------------|--------------|------------|
| 1. im'pasəbəl | impossible | 7. i'revrənt | irreverent |
|---------------|------------|--------------|------------|

2. i'litərət	illiterate	8. in'vælyəbəl	invaluable
3. insə'fiʃənt	insufficient	9. in'friykwent	infrequent
4. in'ept	inept	10. insə'fiʃənsiy	insufficiency
5. in'talərənt	intolerant	11. instə'bilətiy	instability
6. in'ɔrdnət	inordinate	12. iriy'pleysəbəl	irreplaceable

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{im-} occurs before a bilabial stem.

{i-} occurs before a retroflex or lateral stem.

{in-} occurs elsewhere.

{im- → in- → i-} are allomorphs of the same morpheme.

Problem 7: Yaruba (Nigeria)

Describe the affix. Pitches are marked /´/ high, /˘/, unmarked mid.

1. bà	overtake	1a. mbá	is overtaking
2. ba	hide	2a. mba	is hiding
3. bà	perch	3a. mbà	is perching
4. fɓ	break	4a. mɓfɓ	is breaking
5. kɔ	write	5a. ŋkɔ	is writing
6. gùṅ	climb	6a. ŋgùṅ	is climbing
7. wá	come	7a. ŋwá	is coming
8. lɔ	go	8a. ɲlɔ	is going
9. sùn	sleep	9a. ɲsùn	is sleeping
10. jɔ	fight	10a. ɲjɔ	is fighting
11. té	spread	11a. ɲté	is spreading
12. dùṅ	pain	12a. ɲdùṅ	is paining

Problem 8: Ilocano (Philippine Islands)

What are the allomorphs of the morphemes meaning 'my, your, and his'?

State their distribution.

1. tugawko	my chair	1a. tugawmo	your chair	1b. tugawna	his chair
2. sabak	my banana	2a. sabam	your banana	2b. sabana	his banana
3. bagasko	my rice	3a. bagasmo	your rice	3b. bagasna	his rice
4. sidak	my food	4a. sidam	your food	4b. sidana	his food

Problem 9: Turkish

State the distribution of the allomorphs of the morpheme meaning 'my.'

1. el	the hand	1a. elim	my hand
2. göz	the eye	2a. gözüm	my eye

3. diř	the tooth	3a. diřim	my tooth
4. kiz	the girl	4a. kizim	my girl
5. kuř	the bird	5a. kuřum	my bird
6. gül	the rose	6a. gülüm	my rose
7. kol	the arm	7a. kolum	my arm
8. pul	the stamp	8a. pulum	my stamp
9. yař	age	9a. yařım	my age
10. dost	the friend	10a. dostum	my friend
11. ev	the house	11a. evim	my house

Problem 10: Hanunoo (Philippine Islands)

Two affixes are illustrated in this data. Describe each of them. There are two morphophonemic changes in the roots. Describe each of them. They are best described in a particular order. Which? Why?

1. ?usa	one	1a. kas?a	once	1b. ?usahi	make it one!
2. duwa	two	2a. kadwa	twice	2b. duwahi	make it two!
3. tulu	three	3a. katlu	three times	3b. tuluhi	make it three!
4. ?upat	four	4a. kap?at	four times	4b. ?upati	make it four!
5. lima	five	5a. kalima	five times	5b. limahi	make it five!
6. ?unum	six	6a. kan?um	six times	6b. ?unumi	make it six!
7. pitu	seven	7a. kapitu	seven times	7b. pituhi	make it seven!

ตัวอย่าง การหาหน่วยเสียงตามเกณฑ์ที่ว่า คำ หรือส่วนของคำใดที่มีความหมายเหมือนกัน และมีรูปต่างกัน แต่ไม่สามารถจะใช้ลักษณะบังคับทางเสียงมาพิสูจน์ว่า เป็นหน่วยคำเดียวกันได้ ถ้าสามารถใช้ลักษณะบังคับของคำ มาเป็นหลักพิสูจน์ได้ หน่วยย่อยของคำนั้นก็จะเป็นหน่วยคำเดียวกัน

Problem D: Tzeltal (Mexico)

List the allomorphs of the verb-forming suffix and under each allomorph the stem or stems with which it occurs.

1. -betan	to loan	1a. bet	debt
2. -?ipan	to nourish	2a. ?ip	strength
3. -?elk'an	to steal	3a. ?elek'	stealing
4. -k'opan	to speak with	4a. k'op	speech
5. -?abatin	to serve	5a. ?abat	servant
6. -?inamin	to take a wife	6a. ?inam	wife
7. -helolin	to be one's namesake	7a. helol	namesake
8. -mulin	to commit sin	8a. mul	sin

9.	-wayčín	to dream of	9a.	wayič	dream
10.	-wayibin	to use for bed	10a.	wayib	bed
11.	-mak'lin	to provide food for	11a.	-mak'	to divide in pieces
12.	-c'aklin	to accompany	12a.	-c'ak	to join
13.	-hawc'un	to fall backwards	13a.	-hawc'-	fall backwards

Notes

1. The second column does not necessarily give the forms of the stems.
2. The stem formative -l- in 11 and 12 constitutes a morpheme.
3. There is a loss of a phoneme /i/ in 9.

การแก้ปัญห

{-un} occurs with the stem: -hawc'

{-an} occurs with the stems: bet 'ip 'elk' k'op

{-in} occurs with the stems: 'abat 'inam mul wayč helol wayib -mak' -c'ak

{-in- -an- -un} are allomorphs of the same morpheme.

Problem 11: Sierra Aztec (Mexico)

State the condition of the plural form and the distribution of its allomorphs.

1.	piotet	egg	1a.	piotemeh	eggs
2.	tit	fire	2a.	timeh	fires
3.	epat	skunk	3a.	epameh	skunks
4.	takat	man	4a.	takah	men
5.	masat	deer	5a.	masameh	deer
6.	askat	ant	6a.	askameh	ants
7.	točín	rabbit	7a.	točimeh	rabbits
8.	miston	cat	8a.	mistomeh	cats
9.	sitalin	star	9a.	sitalimeh	stars
10.	kimičín	rat	10a.	kimičimeh	rats
11.	čapolin	grasshopper	11a.	čapolimeh	grasshoppers
12.	tet	rock	12a.	temeh	rocks
13.	mosta	day	13a.	mostah	days
14.	pio	chicken	14a.	piomeh	chickens

Problem 12: Tsotsil (Mexico)

Identify all the morphemes and describe the distribution of the allomorphs of the morphemes.

1.	-k'uš	put a wedge in	1a.	-k'uš	wedge
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2. -ik'u	put a prop under	2a. -ik'	prop used beneath an object
3. -loni	put a prop against	3a. -lon	prop used against an object
4. -vovi	go crazy	4a. vov	crazy
5. -t'uŋi	become wet	5a. t'uŋ	wet
6. -sakub	become white	6a. sak	white
7. -lekub	become good	7a. lek	good
8. -ʔik'ub	become black	8a. ʔik'	black
9. -tuib	become smelly	9a. tu	smelly

Problem 13: Danakil (Eritrea)

Identify all the allomorphs of the plural morpheme.

<i>Singular</i>		<i>Plural</i>
1. la'den	porcupine	laden'wa
2. 'filla	neck	filli'te
3. li'fiʔ	fingernail	lifi'ʔa
4. a'ʔur	ox	a'ʔu'ra
5. tor'bus	police cap	to'rabus
6. wa'kali	companion	wakal'wa
7. gi'ra	fire	gira'ri
8. gu'lub	knee	gulu'ba
9. tor'bal	canvas cloth	to'rabil
10. da'le	sore	dale'la
11. a'mo	head	amo'ma
12. guru'muda	log	gurumud'wa
13. san	nose	sani'te
14. tas'wir	picture	ta'sawir
15. a'midda	house pole	amid'da
16. ma'go	debt	mago'ga
17. sir'wal	pants	si'rawil
18. manfi'o	sieve	manfi'wa
19. hanga'la	brain	hangal'wa
20. bis'mar	nail	bi'samir
21. 'nabsi	face, health	nabsi'te
22. roga'ʔat	patch	roga'ʔat'wa
23. 'a'ʔi	baby	a'ʔi'te
24. ay'yam	week	ayyami'te

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Figure 1 The International Phonetic Alphabet (revised to 1951)

	Bi-labial	Labio-dental	Dental and Alveolar	Retrosflex	Palato-alveolar	Alveolo-palatal	Palatal	Velar	Uvular	Pharyngeal	Glottal
CONSONANTS	Plosive	p b	t d	[ɖ]			c ɟ	k ɡ	q ɢ		ʔ
	Nasal	m	ɱ	n	ɳ		ɲ	ŋ	ɴ		
	Lateral Fricative			ɬ ɮ							
	Lateral Non-fricative			l	ɭ		ʎ				
	Rollled			r					ʀ		
	Flapped			ɾ	ɽ				ʁ		
	Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
	Frictionless Continnants and Semi-vowels	w ɥ	ɸ	ɹ				j (ɥ)	(w)	ʁ	
VOWELS	Close	(y w u)					Front i y	Central i u	Back u u		
	Half-close	(ø ø)					e ø		ɤ ɔ		
	Half-open	(æ ə)					e æ	ə	ɤ ɔ		
	Open	(ɑ)					ɛ	ɛ	ɤ ɔ		

(Secondary articulations are shown by symbols in brackets)

OTHER SOUNDS.—Palatalized consonants: t̟, d̟, etc.; palatalized [ʃ, ʒ, ʒ̟]. Velarized or pharyngealized consonants: t̠, d̠, z̠, etc. Ejective consonants (with simultaneous glottal stop): p̰, t̰, etc. Impulsive voiced consonants: β, d̰, etc. [fricative trill: σ, ɡ (labialized θ, ð, or z, z̰), ʃ, ʒ (labialized ʃ, ʒ), ɬ, ɮ, b (clicks, Zulu r, q, v), ɺ (a sound between r and l), ɻ Japanese syllabic nasal, ʃ (combination of x and ʃ), ʙ (voiceless w), ɹ, ʁ, ɸ (lowered varieties of i, y, u), ɶ (a vowel between ø and o).

Affricates are normally represented by groups of two consonants (ts, tʃ, dʒ, etc.), but, when necessary, ligatures are used (tʃ, dʒ, etc.), or the marks ʈ or ʡ (or ts, etc.). ʈ also denote synchronic articulation (m̠ = simultaneous m and ɱ). c, ɟ may occasionally be used in place of tʃ, dʒ, and ʃ, ʒ for ts, dz. Aspirates plosives: ph, th, etc. r-coloured vowels: eɹ, aɹ, əɹ, etc., or e', a', ə', etc., or q, ɹ, p, etc.; r-coloured ɔ: ɔɹ or ɔ' or ɹ or ɹ or ɹ.

LENGTH, STRESS, PITCH.—: (full length); ˑ (half length); ˑ (stress, placed at beginning of the stressed syllable); ˑ (high level pitch); ˑ (low level); ˑ (high rising); ˑ (low rising); ˑ (high falling); ˑ (low falling); ˑ (rise-fall); ˑ (fall-rise).

MODIFIERS.—nasality: ̃ breath (j breathed l); voice (g = z); slight aspiration following p, t, etc.; labialization (ɸ = labialized n); dental articulation (ɬ = dental t); palatalization (ʃ = ʃ); specially close vowel (e = a very close e); specially open vowel (ɛ = a rather open e); ˑ (tongue raised (c or ɟ = ɟ); ˑ (tongue lowered (e or ɛ = ɛ); ˑ (tongue advanced (u or y = an advanced u, ɹ = ɹ); - or ˑ (tongue retracted (i- or j = iˑ, ɹ = alveolar l); ˑ (lips more rounded; ˑ (lips more spread. Central vowels: ɪ (= i), ʊ (= u, ɛ (= ə), ɔ (= o, ɛ, ɤ, ɹ (e.g. ɹ) syllabic consonant; ˑ (consonantal vowel; ˑ (variety of ʃ resembling ʒ, etc.

Figure 2 The International Phonetic Alphabet (revised to 1979)

	Bilabial	Dental, Alveolar, or Post-alveolar	Palato-alveolar	Palatal	Velar	Uvular	Labial-velar	Pharyngeal	Glottal
S	m	n		p	q	ʁ			
	b	t d		c j	k g	q ɠ	ɸ β		ʔ
ʃ	ɸ β	ʃ ʒ	f ʒ	ç j	x ɣ	χ ʁ			
				j	ɰ				
N									
A									
N									
O									
N									
B									
O									
N									
O									
N									
O									
N									

DIACRITICS

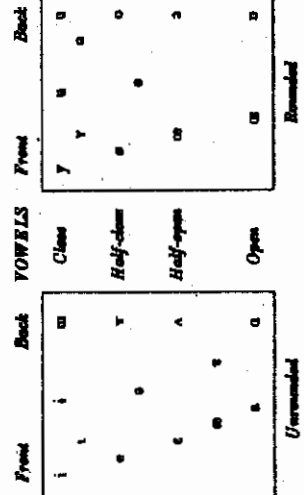
- Vowels ɨ ʉ
- Vowel ɘ
- Aspirated ʰ
- Breathily-voiced ʙ
- Dental ɲ
- Labiodental ɱ
- Palato-dental ɽ
- Velarized or Pharyngealized ɤ, ɛ̠, ɛ̡
- Syllabic ɹ̥
- Simultaneous ɟ (but see also under the heading Affricates)

OTHER SYMBOLS

- or • Raised e, ɛ̥ ɛ̥
- or • Lowered e, ɛ̣ ɛ̣
- Advanced u, ɯ
- Retracted u, ɯ̠
- Centralized e
- Non-labial ɸ, β
- Long ɔ̃
- Half-long ɔ̃ː
- Non-syllabic ɹ̥
- More rounded ɹ̥
- Less rounded ɹ̥

STRESS, TONE (PITCH)

- stress, placed at beginning of stressed syllable
- secondary stress
- level pitch, high tone
- low level, high rising
- low rising, high falling
- low falling, rise-fall
- fall-rise



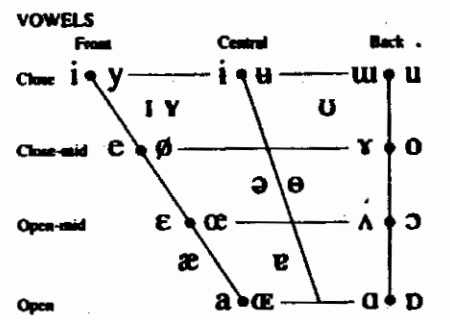
APFRICATES can be written as digraphs, as lightness or with other marks: tʃ, dʒ, ʃ, ʒ, ʧ, ʨ, ʤ, ʥ, ʦ, ʢ, ʣ, ʧ, ʨ, ʤ, ʥ, ʦ, ʢ, ʣ

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Figure 3 The International Phonetic Alphabet (revised to 1989)

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal		m ɱ		n ɳ		ɳ	ɲ	ŋ	ɴ		
Trill				r					ʀ		
Tap or Flap				ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			
Ejective stop	pʼ			tʼ		ʈʼ	cʼ	kʼ	qʼ		
Implosive	ɓ ɗ			ɟ ɠ			ɕ ɟ	ɠ ɡ	ɢ ɣ		

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.



Where symbols appear in pairs, the one to the right represents a nasalized vowel.

OTHER SYMBOLS

- ʌ Voiceless labial-velar fricative
- ʷ Voiced labial-velar approximant
- ɥ Voiced labial-palatal approximant
- ʜ Voiceless epiglottal fricative
- ʕ Voiced epiglottal fricative
- ʡ Epiglottal plosive
- ɕ ʑ Alveolo-palatal fricatives
- ʒ Additional mid-central vowel
- ɔ Bilabial click
- ɔ̥ Dental click
- ɔ̥ Postalveolar click
- ɔ̥ Postalveolar click
- ɔ̥ Alveolar lateral click
- ɔ̥ Alveolar lateral flap
- ɕ ʑ Simultaneous ʃ and ʒ

Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary. kp ts

DIACRITICS

• Voiceless	̥	• More rounded	̙	• Labialized	̟	• Nasalized	̃
• Voiced	̤	• Less rounded	̘	• Palatalized	̠	• Nasal release	̚
• Aspirated	̤ʰ	• Advanced	̟	• Velarized	̙	• Lateral release	̜
• Breathy voiced	̤ʰ	• Retracted	̠	• Pharyngealized	̙	• No audible release	̚
• Creaky voiced	̤ʰ	• Centralized	̞	• Velarized or pharyngealized	̙		
• Lingual labial	̟	• Mid-centralized	̞	• Raised	̠	(ɹ = voiced alveolar fricative)	
• Dental	̟	• Syllabic	̙	• Lowered	̠	(β = voiced bilabial approximant)	
• Apical	̟	• Non-syllabic	̙	• Advanced Tongue Root	̟		
• Laminar	̟	• Rhoticity	̙	• Retracted Tongue Root	̟		

SUPRASEGMENTALS

- Primary stress
- Secondary stress
- Long
- Half-long
- Extra-short
- Syllable break
- Minor (foot) group
- Major (intonation) group
- Linking (absence of a break)
- Global rise
- Global fall

