name: _____

Extended Analysis Problem -- an unidentified language

For English 543 students only. Weight 15%

(English 443 students are invited to do this problem for fun, but there is no extra credit.)

Due: 5:00 pm Friday, 16 December. You can turn in hard copy – slide it under the door of Avery 347, or use the class drop box, or send me an e-mail attachment. If you turn in the final on-line, please give your file the name: *Your-Last-Name 543 Extended Analysis*

Rules:

Write your answers on these sheets and on your own blank sheets as needed.

This problem is open-book, open-notes; you may use any written or on-line references except that you should not try to identify the language and look up the answer.

The rules about collaboration for this problem are the same as for the take-home final exam and different from the regular weekly assignments. You are encouraged to work together on the weekly assignments; but you must do this problem independently; collaboration is cheating. If you have questions about this problem, send me an e-mail.

General directions:

This assignment asks you to analyze a single process in the phonology of an unidentified language, an alternation between [ə] and ∅ that appears throughout the noun and verb systems. When you look at a limited set of data in (1), you will find that there is more than one possible analysis. At each step in the problem, you will add additional data and adjust your analysis to account for the full data set. Sometimes this will involve changes in your rule(s), other times it will require a change in your assumed underlying representations.

In section (4), you will find that you can use your well-supported analysis of the ə ~ ∅ process to give evidence about other aspects of the phonological system, specifically about whether aspirates and affricates should be analyzed as single segments or as sequences. Section (5) asks you to assemble and summarize your whole analysis for (1-4).

The last three pages (p9-11) are an optional extra-credit section (6) lets you apply your analysis in much the same way to give evidence about the correct UR for phonologically nasalized vowels in this language.

The assignment is therefore an extended exercise in model testing and improvement. Your end product will be a series of data sets with intermediate stages of your analysis and a final complete analysis that will account for all the data. This final analysis will include a complete lexicon that gives the final version of your URs for all the N and V stems.

At each stage in the analysis, present your current rule(s) in English and in any convenient combination of segments and features. For the final version of your rule(s), give also a full formalization using Odden's feature system.

Some of the sections will ask for short explanations. Feel free to provide any additional commentary you find useful.

Notes on transcription:

[ʈ ɖ ɳ ɽ] are retroflex. [c, j, ʃ, ɲ] are alveopalatal; [c, j] are voiceless and voiced alveopalatal affricates. A question later in the problem will ask you to decide whether these affricates represent one segment or two phonologically. Aspirated stops and affricates are written as sequences of stop/affricate + h – [th, kh, bh, dh, ch, jh] and so on. A question later in the problem will ask you to decide whether these Ch elements represent one segment or two phonologically.

Vowels marked with ":" are long, [e:, a:, i:] etc. Vowels marked with "~" are nasalized, [ã, õ, ĩ] etc. Vowels marked with both are both long and nasalized, [ã:, õ:, ĩ:], etc.

(1) Analyze the data in #1-7. You will find that the stems show an alternation between allomorphs with and without a [ə], and that there are two equally good analyses of this ə ~ Ø alternation. State those two analyses using the spaces provided below, and test each analysis by giving derivations for the three forms of 'lesson'. (As always, make sure that your analyses work for all the data, not just for the specific derivations that I ask you to display.)
Note: Odden shows how to write deletion and insertion rules p68 and gives relevant useful examples p99.

Nominative Singular	Oblique Plural	Agentive	Stem UR Analysis A	Analysis B	Gloss
1. kəmər	kəmrõ:	kəmərne:			'waist'
2. kusum	kusumõ:	kusumne:			'flower'
3. pəthik	pəthikõ:	pəthikne:			'wayfarer'
4. səbək	səbkõ:	səbəkne:			'lesson'
5. ke:sər	ke:srõ:	ke:sərne:			'saffron'
6. ka:rək	ka:rkõ:	ka:rəkne:			'case'
7. su:rət	su:rtõ:	su:rətne:			'shape'

UR for affixes:
Nominative Sg:
Oblique Pl:
Agentive:

Rule(s): Analysis A: Analysis B:

Derivations: ke:sər ke:srõ: ke:sərne: 'saffron'
Analysis A: Analysis B:

(2) Add #8-11 to your data set. You will find that #8-11 give decisive evidence to pick one of your analyses over the other. Write a very short paragraph explaining this, including whatever derivations you need to show that one analysis works and the other doesn't. Summarize your resulting analysis at the bottom of the page and identify the correct URs for the stems in the space provided.

Nominative Singular	Oblique Plural	Agentive	Stem UR	Gloss
8. qətl	qətlõ:	qətlne:		'murder'
9. swərg	swərgõ:	swərgne:		'heaven'
10. kəst	kəstõ:	kəstne:		'trouble'
11. fikr	fikrõ:	fikrne:		'worry'

Explain the significance of this data using derivations:

Summary of current analysis:
Explanation of URs for stems and affixes:

Current rule statement(s):

(3) Add #12-17 to your data set. You will find that these examples show that you need to make a small revision in the rule you developed after (2). Write a very short paragraph explaining this, including whatever derivations you need to show that your previous rule statement doesn't work and your revised rule statement does. Summarize your resulting analysis at the bottom of the page and give URs for the stems in the space provided.

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Nominative Singular	Oblique Plural	Agentive	Stem UR	Gloss
12. pustək	pustəkõ:	pustəkne:		'book'
13. ki:rtən	ki:rtənõ:	ki:rtənne:		'song'
14. əkʃər	əkʃərõ:	əkʃərne:		'letter'
15. tiləsm	tiləsmõ:	tiləsmne:		'magic'
16. surəŋg	surəŋgõ:	surəŋgne:		'tunnel'
17. dərəst	dərəstõ:	dərəstne:		'tree'

Explain the significance of this data using derivations:

(1) Derivations using my previous rule statement:

(2) Improved rule statement:

(3) Derivations using the improved rule statement:

(4) Conclusion: Summary of revised analysis:

(4) In #18-22, we see verbs showing the same ə ~ Ø pattern that we saw with nouns in #1-17.
(4a) Explain how this works briefly, giving the necessary URs and showing derivations for #20 and #22.

Stem	Infinitive	Past	Stem UR	Gloss
18. nikəl	nikəlna	nikla		'come out'
19. pəkəɽ	pəkəɽna	pəkɽa		'catch'
20. sihər	sihərna	sihra		'feel frigid'
21. nisəns	nisənsna	nisənsa		'breathe'
22. səmərp	səmərpna	səmərpa		'give'
23. suləjh	suləjhna	suljha		'solve'
24. ukhəɽ	ukhəɽna	ukhɽa		'be uprooted'
25. uchəl	uchəlna	uchla		'jump'

(4a) Explain the ə ~ Ø pattern in #18-22:
URs for verb affixes:
Infinitive:
Past tense:

derivations:

20.	sihər	sihərna	sihra	22.	səmərp	səmərpna	səmərpa

(4b) A controversial aspect of the phonology of this language is whether aspirated consonants (transcribed here as Ch sequences, [th, kh, bh, dh, ch, jh] etc.) should be treated as sequences of stop/affricate + *h* or as single segments that are [+aspirated], [t^h, k^h, b^h, d^h, c^h, j^h] etc. Given your analysis of ə ~ Ø, #23-25 give crucial evidence on this question: Your analysis will work smoothly with one treatment of aspiration, but your rule will generate the wrong output with the other treatment of aspiration. Explain briefly, giving the Stem URs for each version of aspiration, with appropriate derivations to show what works and what doesn't.

Analysis of #23-25, explaining the implications for the analysis of aspiration:
(Include derivations as needed.)

(4c) A parallel issue arises with affricates: We have been writing the alveopalatal affricates as /c/ and /j/ as if they were single segments, but phonetically they are sequences of stop plus fricative [t ʃ] and [d ʒ]. Which is the right analysis at abstract phonological level where the ə ~ ∅ rule applies? Do we have sequences /t ʃ/ and /d ʒ/, or single segments /tʃ/ and /dʒ/ ? Similarly for the aspirated affricates: Are these sequences of three segments /t ʃ h/ and /d ʒ h/? Sequences of two segments /tʃ h/and /dʒ h/ or /t ʃʰ/ and /d ʒʰ/? Or single segments/tʃʰ/ and /dʒʰ/?

#23 and #25 give crucial evidence on this question: Your analysis will work smoothly with one treatment of affricates, but your rule will generate the wrong output with the other treatment. Explain briefly, giving the Stem URs for each version of affricates and appropriate derivations to show what works and what doesn't.

Analysis of #23 and #25, explaining the implications for the analysis of affricates:
(Include derivations as needed.)

(5) Conclusion: Summary of final analysis.
Provide a lexicon (URs for all morphemes) and the final version of your rule statement(s) in English, informal segment/feature notation, and in formal feature notation using Odden's Chapter 3 system. Show how your model works by giving derivations for all three forms of 1, 2, 3, 9, 15, 20, 22, and 23 with some very brief commentary. (Use your lexicon listing to make sure that your given URs and rule(s) actually generate all the right surface forms.)
Include any additional discussion you find useful.

Lexicon:

URs for affixes:

Noun affixes:	Nominative Sg:	Verb affixes:	Infinitive:
	Oblique Pl:		Past tense:
	Agentive:		

URs for N-Stems:

Nominative Singular	Oblique Plural	Agentive	Stem UR	Gloss
1. kəmər	kəmrõ:	kəmərne:		'waist'
2. kusum	kusumõ:	kusumne:		'flower'
3. pəthik	pəthikõ:	pəthikne:		'wayfarer'
4. səbək	səbkõ:	səbəkne:		'lesson'
5. ke:sər	ke:srõ:	ke:sərne:		'saffron'
6. ka:rək	ka:rkõ:	ka:rəkne:		'case'
7. su:rət	su:rtõ:	su:rətne:		'shape'
8. qətl	qətlõ:	qətlne:		'murder'
9. swərg	swərgõ:	swərgne:		'heaven'
10. kəst	kəstõ:	kəstne:		'trouble'
11. fikr	fikrõ:	fikrne:		'worry'
12. pustək	pustəkõ:	pustəkne:		'book'
13. ki:rtən	ki:rtənõ:	ki:rtənne:		'song'
14. əkʃər	əkʃərõ:	əkʃərne:		'letter'
15. tiləsm	tiləsmõ:	tiləsmne:		'magic'
16. surəŋg	surəŋgõ:	surəŋgne:		'tunnel'
17. dərəst	dərəstõ:	dərəstne:		'tree'

URs for V-Stems:

Stem	Infinitive	Past	Stem UR	Gloss
18. nikəl	nikəlna	nikla		'come out'
19. pəkəɽ	pəkəɽna	pəkɽa		'catch'
20. sihər	sihərna	sihra		'feel frigid'
21. nisəns	nisənsna	nisənsa		'breathe'
22. səmərp	səmərpna	səmərpa		'give'
23. suləjh	suləjhna	suljha		'solve'
24. ukhəɽ	ukhəɽna	ukhɽa		'be uprooted'
25. uchəl	uchəlna	uchla		'jump'

Summary of final analysis (continued):

Rule statement(s):

(English, informal segment/feature notation, and formal feature notation)

Derivations:

1. kəmər	kəmrõ:	kəmərne:	2. kusum	kusumõ:	kusumne:
3. pəthik	pəthikõ:	pəthikne:	9. swərg	swərgõ:	swərgne:
15. tiləsm	tiləsmõ:	tiləsmne:	20. sihər	sihərna	sihra
22. səmərp	səmərpna	səmərpa	23. suləjh	suləjhna	suljha

Optional / Extra Credit

You will get full credit (15% of course grade) for a successful analysis of the preceding sections (1-5). For a modest amount of extra credit, a maximum of 5% added to your raw score before curving, I invite you to try the more difficult material in (6). A complete analysis of this data requires the concept of "rule order", one rule needing to apply before a second rule applies. Rule order is developed in Chapter 5, which has not been assigned; but I suspect you can figure out what you need for (6) without working through the whole chapter.

If the part in (6c) about "abstract analysis of nasalized vowels" doesn't make sense, you can still get noticeable extra credit from seeing the problem (6a) and proposing one way to fix it (6b).

Note on transcription: Vowels marked with ":" are long, [e:, a:, i:] etc. Vowels marked with "~" are nasalized, [ã, õ, ĩ] etc. Vowels marked with both are both long and nasalized, [ã:, õ:, ĩ:], etc.

(6) (6a) Propose the expected URs and apply your existing ə ~ Ø rule system to the data in xc-1-8; you will hit a problem. XC-6-8 work fine, but xc-1-5 don't work. Explain briefly what goes wrong.

(6b) One way to fix this is to add some additional condition(s) to your rule, to "embellish" your rule, as the author of the original problem put it. This is what you did in section (3). Propose URs and a revised version of your rule that will handle all the data in #1-25, plus the new data in xc-1-5 (and xc-6-8).

(6c) A second way to fix this is to leave your ə ~ Ø rule system unchanged, but to develop an abstract analysis of nasalized vowels. (Note that I'm not telling you what I mean by "an abstract analysis" – that's part of what you need to figure out and what makes this extra credit.) This will change the URs, and will require a new rule to change the abstract underlying structure into the observed surface nasalized vowels. (This rule might apply before or after your ə ~ Ø rule; you will need to specify the order.)

The following distributional facts about this language appear to support an abstract analysis of nasalized vowels. First, while there is a contrast between long and short oral vowels, all nasal vowels are long. Second, within a morpheme long oral vowels do not generally appear before a cluster of nasal plus consonant. Only short oral vowels may occur there. Finally, nasal vowels do not appear before nasal consonants.

Propose base forms for these nasalized vowels and a rule to get from the base form to the surface form. Do sample derivations to determine the order of application for your new nasal vowel rule and your previous ə ~ Ø rule.

(6d) Which looks better, the surface analysis in (6b) or the more abstract analysis in (6c)? Explain briefly.

	Nominative Singular	Oblique Plural	Agentive	Stem UR (6b analysis)	(6c analysis)	Gloss
xc-1	ã:gən	ã:gənõ:	ã:gənne:			'courtyard'
xc-2	ã:cəl	ã:cəlõ:	ã:cəlne:			'corner'
xc-3	ĩ:dhən	ĩ:dhənõ:	ĩ:dhənne:			'fuel'
xc-4	bhã:jək	bhã:jəkõ:	bhã:jəkne:			'reopener'
xc-5	sã:bhər	sã:bhərõ:	sã:bhərne:			'refreshment'
xc-6	ma:nəs	ma:nsi:	ma:nəsne:			'mind'
xc-7	ki:mət	ki:mti:	ki:mətne:			'price'
xc-8	da:nəv	da:nvi:	da:nəvne:			'demon'

(6a) Explain why xc-1-5 don't fit the analysis you developed in (5).

(6b) Propose a revised version of your rule that will handle #1-25, plus xc-1-5 and xc-6-8. Test your revised rule with derivations for #1, 6, 13, xc-1, xc-5, and xc-6. Add any commentary that seems useful.
revised rule statement (features optional):

derivations:

1.	kəmər	kəmrõ:	kəmərne:	6.	kaːrək	kaːrkõ:	kaːrəkne:
xc-1	ãːgən	ãːgənõ:	ãːgənne:	xc-5	sãːbhər	sãːbhərõ:	sãːbhərne:
xc-6	maːnəs	maːnsi:	maːnəsne:				

(6c) Propose base forms for these nasalized vowels and a rule to get from the base form to the surface form. Give the new Stem URs implied by your re-analysis of the nasalized vowels. Do sample derivations to determine the order of application for your new nasal vowel rule and your previous ə ~ Ø rule.

base forms:

Proposed new rule to get surface nasalized vowels:

Test rule order with derivations:

(6d) Which looks better, the surface analysis in (6b) or the more abstract analysis in (6c)? Explain briefly.