

(C) Aymara Rules (I/I)

Languages have rules or constraints about how sounds should be put together to make words. Not just any combination of sounds can be a word. Linguists refer to these restrictions on word formation as the phonotactics of a language. There are many types of rules one can write to describe sound patterns. Consider the following three rule types:

Counting Mod 2: These constraints require that a certain sound occur either an even or odd number of times. We write Counting Mod 2 constraints as follows: either $X=Even$, meaning the sound X must occur an even number of times, or $X=Odd$, meaning the sound X must occur an odd number of times. For example, $b=Even$ requires that there be an even number of b's in every word. Thus, $b=Even$ rules out words like "bas" or "bisbanib" while allowing words like "tas" or "bistanib". The rule $b=Odd$ would do the exact opposite: allow "bas" and "bisbanib" but rule out "tas" and "bistanib".

Strictly 2-Local: These constraints prohibit two sounds from occurring right next to each other...meaning that X and Y cannot occur right next to each other in any order. For example, *bn prohibits a b right before an n and an n right before a b. Thus, *bn rules out "abnik" and "anbik" as possible words, while allowing words like "atnik" or "abanik".

Strictly 2-Piecewise: These constraints prohibit two sounds from occurring together in the same word... meaning that X and Y must not occur in the same word, no matter what may or may not come in between them. For example, *[bn] prohibits words with both b and n. Like *bn, *[bn] allows words like "atnik" and rules out "abnik", but unlike *bn, *[bn] also rules out "abanik" and "anabik".

Out of these three types of rules, only two are known to be needed when describing the phonotactics of human languages. In this problem, you will write constraints in the forms just described in order to account for some of the phonotactics of Bolivian Aymara, an indigenous language spoken in Bolivia. The following is a list of acceptable and unacceptable words in Aymara:

Acceptable:				
tama	pisi	kikpa	putu	jaqet
weqo	janana	oqara	qolqeni	mayni
unoqeña	purapa	kunka	taqe	nayra
kawki	alwa	tarkaka	jiliri	tukjata
sipita	qawa	qemi	qapa	tiwula

Unacceptable:		
waketi	kutaka	maqetaqi
uteka	qaqira	taqaki
jakaqe	temaka	kaape

C1. Write a set of constraints that will rule out all of the bad forms while permitting all of the good forms. Use as few constraints as possible. Follow the format described above for writing constraints. Note: you don't need to account for every pattern you might find. You will lose points only for ruling out the acceptable forms, failing to rule out the unacceptable forms, or using more constraints than necessary.

C2. Which type of constraint isn't needed?

