

**Igbo vowel phonemes**

Igbo is a Benue-Congo language of the Niger-Congo family spoken in Nigeria. Igbo has eight vowel phonemes: /i ɪ e æ ɔ o ʊ u/. Rewrite these vowels in chart form, labeling the rows and columns appropriately with all and only the features needed to distinctively characterize them in Igbo. (Ikekeonwu 1999)

**Hong Kong Cantonese consonant phonemes**

The Hong Kong dialect of Cantonese (a.k.a. Yue) is a Chinese language of the Sino-Tibetan family spoken in Hong Kong. Hong Kong Cantonese has nineteen consonant phonemes: /p p<sup>h</sup> t t<sup>h</sup> k k<sup>h</sup> k<sup>w</sup> k<sup>wh</sup> ts ts<sup>h</sup> f s h m n ŋ l j w/. Rewrite these consonants in chart form, labeling the rows and columns appropriately with all and only the features needed to distinctively characterize them in Hong Kong Cantonese. (Zee 1999)

**Natural classes**

Each of the following sets of sounds consist of a natural class of sounds, plus an extra sound. For each set, determine which sound is not a member of the natural class, and give a minimal distinctive feature description for the natural class.

[k<sup>w</sup> v p r f m]      [p n g b tʃ m f]      [f g n p d m]      [e a i æ ε]      [n l ɔ z r h]

**Turkish sound system**

Turkish is a Turkic language of the Altaic family, spoken in and around Turkey. It has the following consonant and vowel phonemes: /p t c k b d ʃ g tʃ dʒ m n f v s z ʃ ʒ ɣ h r j ʎ l i y e œ u o a/. (Zimmer and Orgun 1999)

a. Rewrite these sounds in chart form, labeling the rows and columns appropriately with all and only the features needed to distinctively characterize them in Turkish.

b. For each of the following sounds, give the minimal feature description sufficient to distinguish it from the other sounds in Turkish.

[a]      [tʃ]      [j]      [r]      [œ]      [ɣ]      [c]      [ʎ]      [u]      [h]

c. Each of the following sets of sounds forms a natural class in Turkish. Give the minimal feature description for each natural class.

[i y u u]      [l ʎ r]      [a o]      [m n]      [u o a]  
[tʃ ʃ c]      [i e]      [b d ʃ g]      [e œ o]      [k g ɣ]