Answers to Exercises 5.10

1. For each group of sounds, identify the odd one out, and state the feature that differentiates it from the other sounds in the group:

   a. [q] is a stop [-cnt], all others are [+cnt]
   b. [β] is [LABIAL], all others are [COR]
   c. [ɪ] is [+tns], the rest are [-tns]
   d. [ɯ] is [+back], the rest are [-back]
   e. [x] is [DORSAL], all others are [COR]

2. List the features required to identify the following groups of sounds:

   1. /e æ o/  
      [+syll]  
      -high  
      -low

   2. /p b t d c ç k g ʔ/  
      [-cnt]  
      [-nas]

   3. /i e æ/  
      [+syll]  
      [+ba]

   4. /k g x ɣ/  
      [+cons]  
      -son  
      [DORS]

   5. /n l r/  
      [+son]  
      +cons  
      [COR]

3. For the following changes, describe first the class of sounds on the left, using as few features as you can, then list all and only the features that change.

   a. /l, r/ → [ɾ, ɹ]
      [+son]  
      -nas  
      [+cons]  
      → [-voi]
b. /e, o/ → [ε, ɔ]

\[
\begin{array}{c}
\text{[+son]} \\
\text{[+syl]} \\
\text{-[high]} \\
\text{-[low]}
\end{array} \rightarrow \text{[-tns]}
\]

c. /p, t, k/ → [f, θ, x]

\[
\begin{array}{c}
\text{[-cnt]} \\
\text{[-voi]}
\end{array} \rightarrow \text{[+cnt]}
\]

d. /t, d/ → [ʈ, ɖ]

\[
\begin{array}{c}
\text{[COR]} \\
\text{-[cnt]} \\
\text{-[son]}
\end{array} \rightarrow \text{[-ant]}
\]

e. /β, δ, γ/ → [b, d, g]

\[
\begin{array}{c}
\text{[-son]} \\
\text{[+cnt]} \\
\text{[+voi]}
\end{array} \rightarrow \text{[-cnt]}
\]

4 Recasting phoneme problems from chapter 3

Daga

\[
\begin{array}{c}
\text{[COR]} \\
\text{-[cnt]}
\end{array} \rightarrow \text{[+cnt]} / \text{[V \text{-back}]} 
\]

Russian

\[
\begin{array}{c}
\text{[V]} \\
\text{[+high]} \\
\text{[+back]}
\end{array} \rightarrow \text{[+back]} / \text{[C \text{+high} \text{+back}]}
\]

This assumes that all Russian consonants that are not palatalized are velarized. Furthermore, it assumes that /ʃ and ʒ/ are actually velarized, which is problematic.
Papago

\[
\begin{align*}
&\left[ \begin{array}{c} C \\
\text{COR} \\
\text{-cnt} \end{array} \right] \rightarrow [+\text{delayed release}] / \quad \left[ \begin{array}{c} V \\
+\text{high} \end{array} \right] \\
&\quad V \rightarrow [-\text{voi}] / \quad \# \\
\end{align*}
\]

Zulu

\[
\begin{align*}
&\left[ \begin{array}{c} V \\
\text{-high} \\
\text{-low} \end{array} \right] \rightarrow [+\text{tns}] / \quad \text{C} \left[ \begin{array}{c} V \\
+\text{high} \end{array} \right] \\
\end{align*}
\]