

# Homework 1

## Solutions

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Feel free to print this and write your answers directly on the assignment itself, or you can write the answers on a separate sheet of paper. Remember to write clearly!

**Question 1, Transcription:** Transcribe the following words in IPA and indicate where the main stress is. Next to each word, indicate how many speech sounds are in that word. (And don't forget about the very common sound in unstressed syllables, [ə]!)

Example: yellow [jélow] 4

a. July

ʤəlári 4

h. thrilling

θrɪlɪŋ 6

b. Thomas

táməs 5

i. ashen

áʃən 4

c. think

θɪŋk 4

j. contacted

kántæktəd 9

d. easy

ízi 3

k. telephone

téləfoun 7

e. pneumonia

nəmóʊnjə 7

l. civic

sívɪk 4

f. awesome

ásəm 4

m. usually

júzuəli 7

g. sugar

ʃúgər 4

n. wraith

ɹeɪθ 3

**Question 2, Place and Manner:** Each pair of consonants listed below shares some phonetic feature, either a place of articulation or a manner of articulation. Indicate which it is (place or manner) as well as what the particular feature is.

Example: [t] [l] place, alveolar

- a. [ʔ] [h] **place, glottal**
- b. [f] [z] **manner, fricative**
- c. [p] [w] **place, bilabial**
- d. [t] [ʔ] **manner, plosive/stop**

**For questions 3-5, Natural Classes:** A natural class is a group of sounds in a language that share some phonetic characteristic(s). Crucially, in order for a group of sounds to constitute a natural class, they must be describable by phonetic characteristics that pick out all and only all of the sounds in that group, for that particular language.

For example, the group of sounds [p, b, t, d, k, g, ʔ] is the natural class of plosives in English: this group contains all and only all of the English plosives. All of the sounds in the group [p, b, t, d, g, ʔ] are plosives, but this group is NOT a natural class, because it is missing one of the plosives, namely [k]. The following questions deal with natural classes, which will become very important in phonology. Note that a natural class can range from something as general as “vowel” (which picks out the group of all vowels in a language) to something as specific as “close back rounded vowel”.

**Question 3:** Each of the following descriptions is a natural class of sounds. Write which speech sound(s) is/are in each natural class. Make sure to use the English IPA chart, not the universal one. (Note that it is possible for a natural class to consist of just one sound.)

Example:   voiced nasal   [m, n, ŋ]

a. bilabial

**[p, b, m, w]**

b. palatal approximant

**[j]**

c. alveolar consonant

**[t, d, s, z, n, l, r]**

d. ~~voiceless~~ glottal plosive

**[ʔ]**

e. central vowel

**[ə]**

f. close back ~~rounded~~ vowel

**[u, ʊ]**

**Question 4:** When describing a natural class, you can sometimes be more or less specific while picking out the same group of sounds. For example, the natural class of voiced nasal consonants is [m, n, ŋ]. The natural class of voiced nasals is also [m, n, ŋ]. In fact, the natural class of nasals is also [m, n, ŋ]. When discussing nasals, the characteristics “voiced” and “consonant” are superfluous, since all nasals in English are voiced and consonants.

With this in mind, go back to the natural classes listed in question 3a–f and cross out the superfluous (unnecessary) descriptors; in other words, what descriptors could you take away and still end up with the same group of sounds? For example, I could cross out “voiced” from “voiced nasal” in the example for question 3.

**Question 5:** For each group of sounds in a–e (next page), state ALL the phonetic features that the sounds in the group share. Is the set of sounds a natural class in English? If not, what sound(s) can you add to make it a natural class? Add as few sounds as possible.

Example: [p] [b] these are both bilabial plosives; yes this is a natural class

Example: [p] [b] [w] these are all bilabials; not a natural class, needs [m]

a. [g] [p] [t] [d] [k] [b]

**These are all stops. It is a natural class.**

b. [u] [o] [ow] [ʌ] [ɑ]

**These are all back vowels. However, [ʊ] is missing from that class.**

c. [v] [z] [ʒ] [dʒ] [n] [g] [d] [l] [ɹ] [w] [j] [b] [m] [ŋ] [r] [ð]

**These are all voiced consonants. It is a natural class.**

d. [ʃ]

**This is a voiceless palato-alveolar fricative. It is a natural class.**

e. [p] [j]

**The only shared feature between these two sounds is that they are consonants. To form a natural class, one would have to add all the other consonants as well.**

**Question 6:** Take a look at the consonant chart for Arabic. (The unfamiliar symbols are simply non-English consonants; their place on the chart shows what their properties are.)

CONSONANTS  
(PULMONIC)

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	<b>b</b>			<b>t d</b>				<b>k g</b>	<b>q</b>		<b>ʔ</b>
Nasal	<b>m</b>			<b>n</b>							
Trill				<b>r</b>							
Tap or Flap				<b>ɾ</b>							
Fricative		<b>f</b>	<b>θ ð</b>	<b>s z</b>	<b>ʃ</b>				<b>χ ʁ</b>	<b>ħ ʕ</b>	<b>h</b>
Affricate					<b>dʒ</b>						
Lateral fricative											
Approximant							<b>j</b>				
Lateral approximant				<b>l</b>							

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

- a. What sounds are in the natural class of pharyngeal fricatives in Arabic? Is one of the characteristics of this natural class (pharyngeal, fricative) superfluous? If so, which?

**In Arabic, the pharyngeal fricatives are the sounds [ħ, ʕ]. ‘Fricative’ is superfluous.**

- b. What is the natural class for the group of sounds [q, χ] in Arabic?

**Voiceless uvular fricatives**

- c. What sounds are in the natural class of approximants in Arabic? Is this the same set of sounds as in English?

**Arabic: [l, j]**

**English: [l, j, ɹ, w]**

- d. The set of sounds [b, m] is not a natural class in English (given what we have discussed so far). Why not? And is this a natural class in Arabic? If so, what is the natural class? **The closest natural class to [b, m] in English is voiced bilabial sounds, a class which also includes [w]. Since Arabic has no [w], this is a natural class in Arabic.**