L303/L503 Exercises: Acoustic analysis
21 June, 2012

Name:_____

I. Record the words “lease” and “leash”. Transcribe the words:
Examine each word in a spectrogram. What do you notice about the difference between the last sounds?

II. Record the words “mead”, “seed”, “mid”, & “hid”. Find each vowel’s first and second formant (F1 & F2).

word	F1	F2
mead		
seed		
mid		
hid		

III. Now record the words “hide” & “side”. Find F1 & F2 at the start and end of the diphthong in each word.

word	start F1	start F2	end F1	end F2
hide				
side				

Based on your measurements of F1 and F2, is the end vowel more like the vowel in “mead” and “seed” or the vowel in “mid” and “hid”?

IV. Record the words “bad”, “pad”, “pod”, “bat”, “pat”, and “pot”. For each word, measure:
1) Aspiration length of the first sound,
2) Vowel length of the vowel,
3) The fundamental frequency of each vowel, and
4) The first and second formants of each vowel.

Record your data in the following chart:

word	aspiration	vowel length	F0	F1	F2
bad					
pad					
pod					
bat					
pat					
pot					

Now find the following averages:

1) Average F0 in all words
2) Avg. aspiration length for words starting w̄ /p/
3) Avg. aspiration length for words starting w̄ /b/
4) Average F1 and F2 for words with /æ/
5) Average F1 and F2 for words with /ɑ/
6) Average length of vowels in words ending in /d/
7) Average length of vowels in words ending in /t/

V. Now record the words “spat”, “spot”, “spa”, and “stop”. Take the same measurements as above. Aspiration should be recorded for the consonant immediately before the nuclear vowel.

word	aspiration	vowel length	F0	F1	F2
spat					
spot					
spa					
stop					

Answer the following questions:
1) What’s the average aspiration time in all the words?
2) Compare the aspiration times to the words in the previous exercise. Are these stops more like the /p/s or /b/s in that exercise?