CSSE 315 – Natural Language Processing
Rose-Hulman Institute of Technology

Worksheet 08
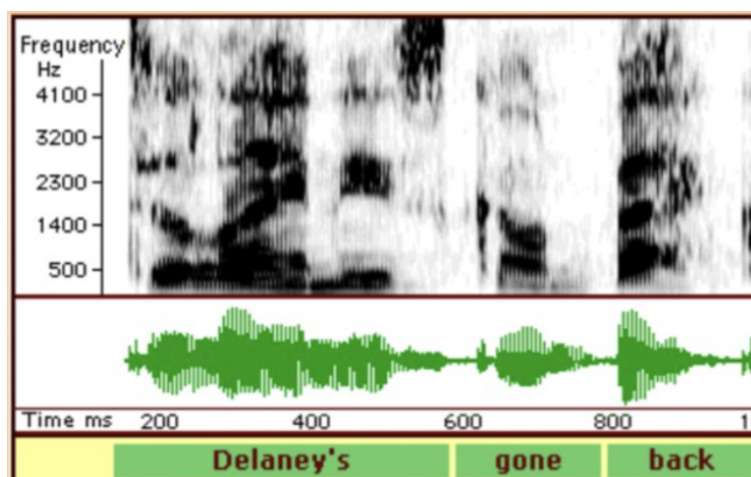
Name (Print):_____   Date:_____

1   Review Questions

1. Review the story about LG electronics What was the problem with their model prototype?

2. Define speech recognition:

3. What are the most common voice assistants?

4. 1. At the _____ level, the speaker's brain formulates ideas into words and _____
   structures.

   2. The _____ level involves motor nerves sending signals to _____ muscles to pro-
   duce speech.

   3. The _____ level transmits speech through sound waves, which travel through _____
   to reach the listener.

   4. The listener's _____ detects sound waves and converts them into _____.

   5. At the _____ level, the listener's brain decodes the signals to understand the message.

5. Part 1: Use any voice assistant from your phone to test the ambiguous phrases (see lecture
   notes)
   Part 2: Test `https://huggingface.co/tasks/automatic-speech-recognition` - record
   your voice using Huggingface automatic speech recognition demo (for example, "is the bay
   bee crying" [try various phrases]) and compute. Describe your experience/comparison

6. Define the sound: _____ that produces a sensation in the human ear

7. Complete the sound properties table:

Type	Definition
	The existence of one wave does not affect the existence or properties of another wave
	Waves can bounce off a surface like a light wave bounces off a mirror; the reflected angle is equal to the incident angle reflected around the normal to the surface
	The passage from one medium to another is normally accompanied by a change of the wavefront direction
	Two similar waves can combine constructively or destructively; musical beats are an example of this behavior

8. Identify Spectogram and speech wave in the figure (top and bottom):

9. Hertz (Hz) is the unit of _____ , which measures how often a sound wave repeats (cycles) per second

10. 1) A bird chirping has a _____ frequency
    2) A drumbeat or thunder has a _____ frequency

11. A sound with 100 Hz frequency repeats its wave _____ times per second
    A sound with _____ Hz frequency repeats its wave 1,000 times per second

12. 1) _____ is the distance between waves
    2) _____ is the size/height of a wave

13. Name 2 reasons why frequency is important:
    1)
    2)

14. Complete the sounds table:

Phonetic Type	Phonetic Symbol	Characteristics
Stops		
Fricatives		
Nasals		
Vowels		
Approximants		

15. Name 2 reason why we need a special phonetic alphabet to represent sounds of language? 1)
    2)

16. When the IPA was developed?

    1. 1988
    2. 1888
    3. 1788

17. Write the English words based on the IPA symbols:

	Consonants						Vowels			
p	pill	t	till	k	kill	i	beet	ɪ	bit
b	bill	d	dill	g	gill	e	bait	ɛ	bet
m	mill	n	nil	ŋ	ring	u	boot	ʊ	foot
f	feel	s	seal	h	heal	o	boat	ɔ	bore
v	veal	z	zeal	l	leaf	æ	bat	a	pot/bar
θ	thigh	tʃ	chill	r	reef	ʌ	butt	ə	sofa
ð	thy	dʒ	gin	j	you	aɪ	bite	aʊ	bout
ʃ	shill	ʍ	which	w	witch	ɔɪ	boy		
ʒ	measure								

Pronunciation

[ðo]

[θɔt]

[rʌf]

[baʊ]

[θru]

[wʊd]