

Ling 473 Assignment 2

Due 4:30pm on Tuesday August 7, 2018

1. (60 points) Using the following sets, we run a trial which selects exactly one word from each set. Within each set, all words are equally likely.

$A = \{ \text{monkey, donkey, yak, kangaroo, aardvark, antelope, puma, cheetah} \}$

$B = \{ \text{whale, shark, dolphin, eel} \}$

Let E be the event that either of the words contain a 'y'

Let F be the event that both words contain an 'e'

Let G be the event that both words contain the same number of letters

Let H be the event that either of the words contains *more than two* vowels $\{ a e i o u \}$. This count includes repeated uses of the same vowel.

- a. Give values for the following:

$P(E)$

$P(F)$

$P(G)$

$P(H)$

$P(E \cup H)$

$P(F \cap H)$

$P(E \cap F \cap G)$

$P(H \cup G)$

$P(H \cap F^c)$

- b. Place a letter 'X' in the table corresponding to the events that are mutually exclusive. Place a letter 'I' in the table corresponding to the events that are independent.

	E	F	G
H			
G			
F			

2. (40 points) Working in Yunnan, a field linguist has discovered an extinct version of the Dongba pictographic script. So far, his team has found 32 distinct glyphs in this script, and the linguist has deciphered 22 of them. He just received news that another researcher has discovered a new inscription that consists of 8 glyphs. These 8 have all previously been encountered, but he doesn't yet know if the new inscription has repeated glyphs, or not.

- a. What is the probability that the linguist will fully understand the newly discovered inscription?
- b. What is the probability that the linguist will understand at least half of the glyphs in the newly discovered inscription?

(Extra Credit: 20 points) The linguist learns that the 8 glyphs in the new inscription are distinct (but still in the set of 32 previously seen glyphs). Now what is the probability that the linguist will understand at least half of them?