

ECE 313**In-Class Activity 1**

Write your name and UID here:

Group Activity 1

Consider a bag with each letter of the English alphabet, i.e., a to z in lowercase. Letters are selected from the bag without replacement

1. What is the probability that the first three letters are vowels?
2. What is the probability that the first three letters are two vowels and one consonant?
3. What is the probability that the first five letters form a palindrome (a palindrome is a sequence that is the same if read right-to-left or left-to-right, e.g., “racecar” is a palindrome)?

How does your answer change if the bag contains two of each letter of the English alphabet? Repeat the problem and answer 1-3 above for this case.

Group Activity 2

A binary communication channel carries data as one of the two types of signals denoted by 0 and 1. As a result of noise, a transmitted 0 is sometimes received as a 1 and a transmitted 1 is sometimes received as a 0. For a given channel, assume a probability of 0.9 that a transmitted 0 is correctly received as a 0 and a probability of 0.85 that a transmitted 1 is received as a 1. Further assume a probability of 0.45 of transmitting a 0. If a signal is sent, determine the:

- a) Probability that a 0 is received.
- b) Probability that a 1 was transmitted, given that a 1 was received.
- c) Probability that a 1 was transmitted, given that a 0 was received.
- d) Probability of an error.