Module 2: Assignment

1. Give two examples of the where a frequentist notion of probability accurately describes the situation . How would you determine these probabilities?
2. Give two examples of “subjective” probabilities. How would you determine these probabilities?
3. An expert indicates the following probabilities:
* Probability of next summer being hotter than this summer is 0.7.
* If next summer is hotter than this one, then the probability that there will be more hurricanes next summer is 0.9.
* The probability that next summer is as hot or cooler than this summer and there are as many or fewer hurricanes is 0.2
1. What is the probability that next summer will be as hot as or cooler than this summer?
2. What is the probability that next summer will be hotter than this summer AND that there will be more hurricanes next summer.
3. Prepare a contingency table for this question.
4. What is the probability that there will be as many or fewer hurricanes next summer if temperatures are as hot as or cooler than this summer?
5. What is the probability that there will be more hurricanes next summer?
6. Next year, more hurricanes are observed. What is the probability that the temperatures were actually as hot as or cooler than the previous summer?
7. Classify the following random variables as continuous or discrete.
8. The number of cars that pass through an intersection within one minute.
9. The amount of time an employee is late to work.
10. The percent of people who contract the flu in February.
11. The value which appears when a contestant spins the wheel on Wheel of Fortune.
12. The rate (in errors per page) at which a court reporter makes a transcription error.
13. Consider the following experiment to determine the value of a random variable. First roll a fair six-sided die. If the result is even, the experiment ends. If the result is odd, flip a coin twice. The random variable is the number of heads observed in a trial of the experiment. Note that if the coin is not flipped, zero heads are observed in the trial.
14. What are the possible values of the random variable?
15. Determine the probabilities of observing each of the possible values in (a). Then sketch the probability mass function and the cumulative distribution function.
16. Examine the labeled cumulative distribution function for random variable, *W*, below. Determine the following probabilities:
	1. The probability that *W* is at most 40.
	2. The probability that *W* is at least 55.
	3. The probability that *W* is between 40 and 60.
	4. The probability that *W* is either less than 5 or greater than 95.

Question 6



(5,0.036)

(40,0.345)

(55,0.579)

(60,0.655)

(95,0.964)

1. In fact, the random variable in Question 6 has a normal distribution with mean = 50 and standard deviation = 25. On the probability density functions on the next page, sketch the probabilities indicated in Question 6.

Question 7

