ECN 480/PUB 580
Assignment #1
Due: Thursday, January 27, 2022, by end of day

Directions: Answer each question electronically in a MS Word or .pdf file. Compile your answers into a single computer file, and then upload it to Canvas under "Assignment #1." Contact me if you have any questions.

1. Super Bowl LVI will be held in New Orleans, Louisiana on February 3, 2022. Explain why the number of points scored by each team is a random variable. **(3 points)**

2. Consider the following random variables. Identify which ones are discrete, which ones are continuous, and why. **(2 points each)**
a. The number of points scored by the Detroit Pistons in their season opener.
b. The temperature on a summer's day.
c. The height of an NBA basketball player
d. Your golf score during a round in the summer.
e. A high school student's ACT score.

3. Suppose you are thinking of gambling on the Detroit Lions' Thanksgiving Day game. A bookie gives you the following bet: If the Lions win, he will pay you $100. If the Lions lose, you pay him $20. Since the Lions are terrible, they only have a 5% chance of winning this game.
a. What is the expected value of this bet? Is it one you would take? Why or why not?
(2 points)
b. Suppose the bookie adjusts the bet. Rather than him paying your $100 if the Lions win, he will pay you $500. You still pay him $20 if the Lions lose. The Lions still have a 5% chance of winning. What is the expected value of this bet, and would you take it? Why or why not?
(2 points)

4. Suppose you are now thinking of gambling on the Detroit Piston's season opener. The bookie offers you two bets. Bet #1 says that if the Pistons win, he will pay you $10. If the Pistons lose, you pay him $5. Bet #2 says that if the Pistons win, he will pay you $10,000. If the Pistons lose, you will pay him $2,000. The Pistons have a 30% chance of winning their season opener.
a. What is the expected value of each bet? **(2 points)**
b. What is the variance of each bet? **(2 points)**
c. Which bet would you take? Why? There is no right or wrong answer, I'm just curious what your reasoning would be. **(1 point)**

5. Describe two random variables, they can be any two random variables that you think either have strong positive correlation or strong negative correlation. Explain your reasoning.
(2 points)

6. Describe two random variables, again, they can be any two random variables, that you think have essentially zero correlation. Explain your reasoning **(2 points)**