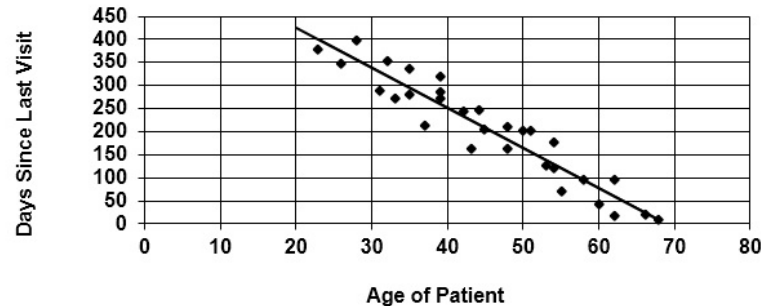


Stat 220 Worksheet 6—Simple Linear Regression/Correlation and Some Probability
Due at the beginning of quiz section on Thursday 20 February.

1. A random sample of patients who attended a clinic was selected. The age of the patient (years) and the number of days since the last visit were collected and are displayed in the figure below. The least-squares regression line for predicting number of days since the last visit from the age of the patient is $\hat{y} = 600.08 - 8.69x$.



- Interpret the slope in the context of the problem.
 - Interpret the y -intercept in the context of the problem.
 - What is the predicted number of days since the last visit to the clinic for a 50-year-old patient?
 - What is the predicted age of a patient when the number of days since the last visit to the clinic is 200 days?
2. Consider a large number of countries around the world. There is a positive correlation between the number of cell phones per person x and the average life expectancy y . Does this mean that we could increase the life expectancy in Rwanda by shipping cell phones to that country?
3. A least-squares regression line is not just any line drawn through the points of a scatterplot. What is special about a least-squares regression line?

4. A social scientist wants to use subjects' number of hours of television watched to predict their score on a test of propensity to violence. Subjects who watch more television do tend to get higher scores on the test. But regressing their violence test score on their hours of television watch explained only 16 percent of the total score. What is the correlation between their hours of television watched and violence test scores?
5. In a fisheries researcher's experiment, the correlation between the number of eggs in the nest and the number of viable (surviving) eggs for a sample of nests is $r = 0.67$. The equation of the regression line for number of viable eggs (y) versus number of eggs in the nest (x) is $y = 0.72x + 17.07$.
- a) What is the coefficient of determination for this regression?
- b) Interpret the coefficient of determination in the context of the problem.
6. There are 2,598,960 possible 5-card hands that can be dealt from an ordinary 52-card deck. In a 5-card hand of poker, a flush is a hand where all 5 cards are of the same suit. Assuming a well-shuffled deck of cards and a random deal, what is the probability of being dealt a flush?
7. When two six-sided die are rolled, the probability of getting a one on both is $1/36$. This means which of the following listed below. Choose the best answer and then **briefly explain**.
- A. Of every 36 rolls, exactly 1 will have both die be one.
- B. In the long run, the average number of ones is $1/36$.
- C. In the long run the outcome that both die are one will occur on $1/36$ of all rolls.
8. Dr. Stats plans to toss a fair coin 10,000 times in the hope that it will lead him to a deeper understanding of the laws of probability. Which of the following statements is true?
- A. It is unlikely that Dr. Stats will get more than 5,000 heads.
- B. Whenever Dr. Stats gets a string of 15 tails in a row, it becomes more likely that the next toss will be a head.
- C. The fraction of tosses resulting in heads should be close to $1/2$.
- D. The chance that the 100th toss will be a head depends somewhat on the results of the first 99 tosses.
- E. All of the above statements are true.