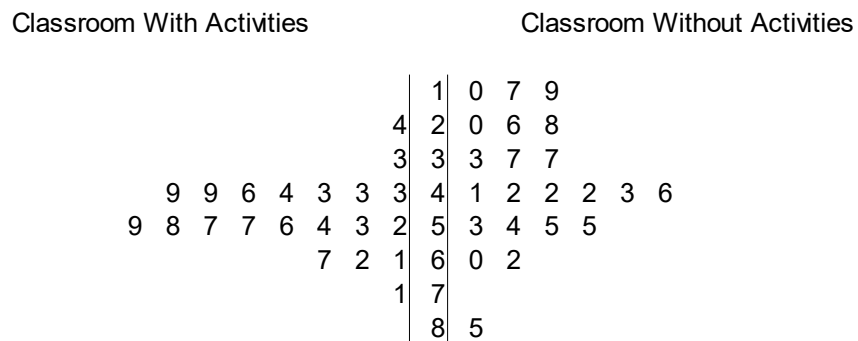1. The mean age of bus drivers in Chicago is 53.5 years. Identify the type I and type II errors for the hypothesis test of this claim.

2. The mean delivery time for Chinese food is less than 30 minutes.

a) Write the null and alternative hypothesis.

b) What kind of test is this? (right tailed, left tailed or two tailed)

3. (Multiple Choice) The mean weight for a bag of chips is 8 ounces. If the hypothesis test is performed, how should you interpret a decision that fails to reject the null hypothesis?

a) There is enough evidence to reject the claim that the mean weight for a bag of chips is 8 ounces.

b) There is not enough evidence to reject the claim that the mean weight for a bag of chips is 8 ounces.

c) There is enough evidence to support the claim that the mean weight for a bag of chips is 8 ounces.

d) There is not enough evidence to support the claim that the mean weight for a bag of chips is 8 ounces.

4. Princeton claims that the average SAT score for Princeton students is more than 1380. A random sample of 35 students is taken and the sample mean and population standard deviation is found to be 1390 and 20 respectively. At the $\alpha = 0.10$, level is there enough evidence to support Princeton's claim.

5. Lance Armstrong claims to ride his bike an average (mean) of 3 hours a day. You stalk him for 7 days and find the sample mean of 3.5 hours and a standard deviation of .5 hours. Is there enough evidence to support Lance's claim at the $\alpha = 0.05$ level?

6. J.K. Rowling claims that 60% of Harry Potter fans will purchase the *The Deathly Hollows* on the first night it is released (July 20, 2007). In a random sample of 500 Harry Potter fans, it was reported that 281 will be purchasing the *The Deathly Hollows*. Test J.K. Rowling's claim at the $\alpha = 0.01$, level of significance. Is there enough evidence to reject J.K. Rowling's claim?

7. Classify the two given samples as independent or dependent.

     Sample 1: The weights of 57 Idaho potatoes.

     Sample 2: The weights of 45 Russet potatoes.

8. Classify the two given samples as independent or dependent.

     Sample 1: The lengths of 56 babies at birth.

     Sample 2: The lengths of the same 56 babies when they are 1 month old.

9. You want to buy a microwave oven and will choose Model A if its repair costs are lower than Model B's. You research the repair cost of 43 Model A ovens to find that the average repair cost is $74 with a population standard deviation of $15.50. You research 52 Model B ovens to find that the average repair cost is $70 dollars with a population standard deviation of $20 dollars. At $\alpha=0.01$, would you buy Model A? Assume samples are randomly selected and that the samples are independent.

10. A personnel director in a particular state claims that the mean annual income is greater in one of the state's counties (county A) than it is in another county (county B). In County A, a random sample of 15 residents has a mean annual income of 41,000 and a standard deviation of 8500. In County B, a random sample of 8 residents has a mean annual income of 39,400 and a standard deviation of 5200. At $\alpha=0.05$, is there enough evidence to support the personnel director's claim? Assume the population variances are not equal.

11. A study of methods for teaching reading in the third grade was conducted. A classroom 21 students participated in directed reading activities for eight weeks. Another classroom, with 23 students, followed the same curriculum without the activities. Students in both classrooms then took the same reading test. The scores of the two groups are show in the back-to-back stem-and-leaf plot.

Classroom With Activities		Classroom Without Activities
	1	0 7 9
4	2	0 6 8
3	3	3 7 7
9 9 6 4 3 3 3	4	1 2 2 2 3 6
9 8 7 7 6 4 3 2	5	3 4 5 5
7 2 1	6	0 2
1	7	
	8	5

Key: 4|2|0 = 24 for classroom with activities and
20 for classroom without activities

At $\alpha=0.05$, is there enough evidence to support the claim that the third graders taught with the directed reading activities scored higher than those taught without the activities? Assume the population variances are equal.

12. A medical researcher claims that calcium supplements can decrease the systolic blood pressures of men. In part of the study, 10 randomly selected men are given a calcium supplement for 12 weeks. The table shows the systolic blood pressures (in millimeters of mercury) of the 10 men before and after the 12 week study. At $\alpha=0.10$, is there enough evidence to support the medical researcher's claim?

Patient	1	2	3	4	5	6	7	8	9	10
Systolic blood pressure (before)	107	110	123	129	112	111	107	112	136	102
Systolic blood pressure (after)	100	114	105	112	115	116	106	102	125	104

13. A medical research team conducted a study to test the effect of migraine drug. In the study, 400 subjects took the drug and 407 subjects took a placebo. The results after two hours are that of the 400 who took the drug 300 were not pain-free two hours later and 100 were pain-free two hours later and of the 407 who took the placebo 366 were not pain-free two hours later and 41 were pain-free two hours later. At $\alpha=0.05$, can you reject the claim that the proportion of subjects who are pain-free is the same for the two groups?

14. Using the data given to draw a scatter plot.

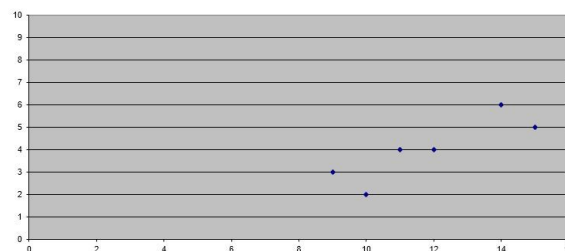15. Find the correlation coefficient and interpret it.

16. Find the least squares regression line.

X	3	5	7	9	11
Y	0	2	3	6	9

17. If x equals 7 find the predicted value of y. What is the residual when x is 7?

18. If x equals 8 find the predicted value of y.

19. Use the scatter diagram below to describe how, if at all, the variables are related.

20. The data below are the final exam scores of 10 randomly selected statistics students and the number of hours they studied for the exam. Construct a scatter diagram for the data.

Hours, x	3	5	2	8	2	4	4	5	6	3
Scores, y	65	80	60	88	66	78	85	90	90	71

21. Use the data from problem number 20 to calculate the correlation coefficient r and interpret it.

22. Use the data from problem 20 to find the equation of the regression line.

23. Given the equation of the regression line is $\hat{y}=3.2x-1.3$, what is the predicted value for y given $x=2.4$.

24. The regression line for the given data is $\hat{y}=-0.206x+2.097$.

x	-5	-3	4	1	-1	-2	0	2	3	-4
y	1	-6	8	-3	-2	1	5	-5	6	7

Determine the residual of a data point for which $x=4$ and $y=8$.

25. Acme Toy Company prints baseball cards. The company claims that 30% of the cards are rookies, 60% veterans, and 10% are All-Stars. Suppose a random sample of 100 cards has 50 rookies, 45 veterans, and 5 All-Stars. Is this consistent with Acme's claim? Use a 0.05 level of significance.