

Workshop Statistics: Discovery with Data, Second Edition

Topic 8: Graphical Displays of Association

Activity 8-6: Height and Foot Length

Answers will vary from class to class.

Activity 8-7: Broadway Shows (*cont.*)

- (a) positive
- (b) C F A D E B

Activity 8-8: College Football Players

(a)-(b)

- 1. true



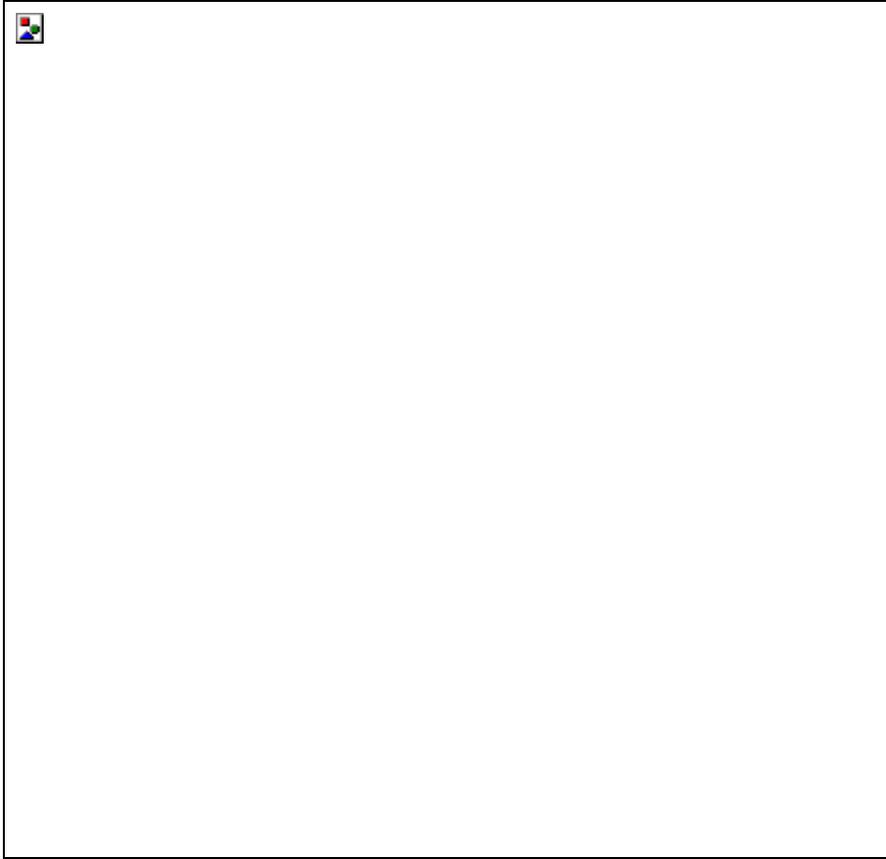
- 2. false

- 3. true
- 4. false (need all the circles generally higher than all the plusses, not just at each number)
- 5. true
- 6. false



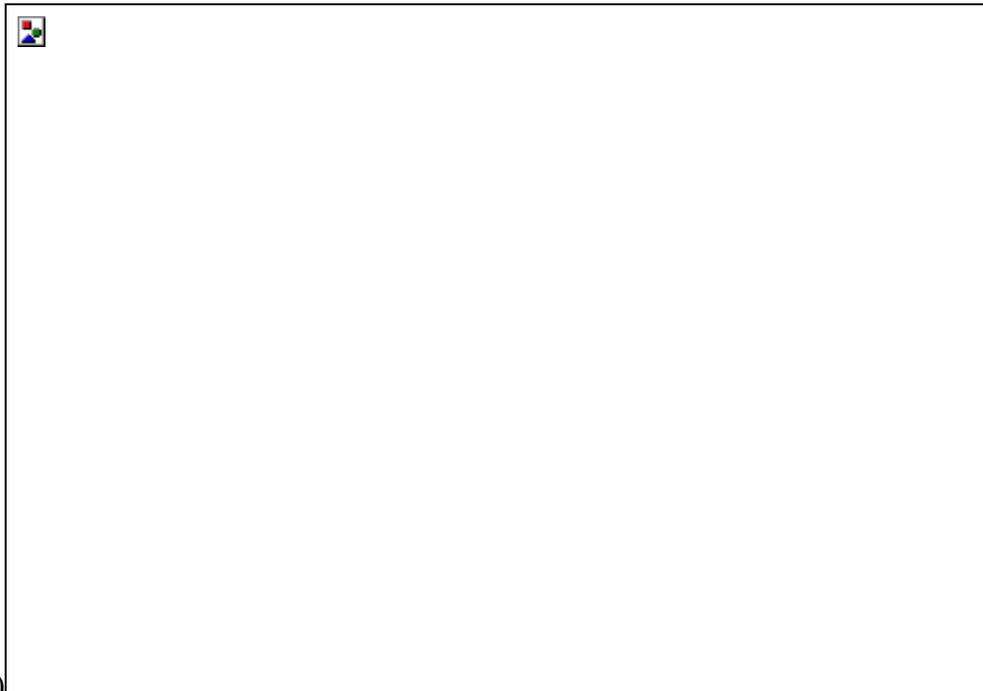
- 7. true
- 8. false





- 9. false

Activity 8-9: Birth and Death Rates (*cont.*)



- (a)
- (b) There is a moderate negative association.

(c) Answers will vary from student to student.

(d) 1

- West Virginia - birth: 11.3; death: 11.5

(e) below the "y = x" line

(f)

- Alaska - birth: 15.9; death: 4.0 (low death rate)
- Utah - birth: 21.2; death: 5.6 (high birth rate)
- Arizona - birth: 18.9; death: 8.2 (high birth rate)

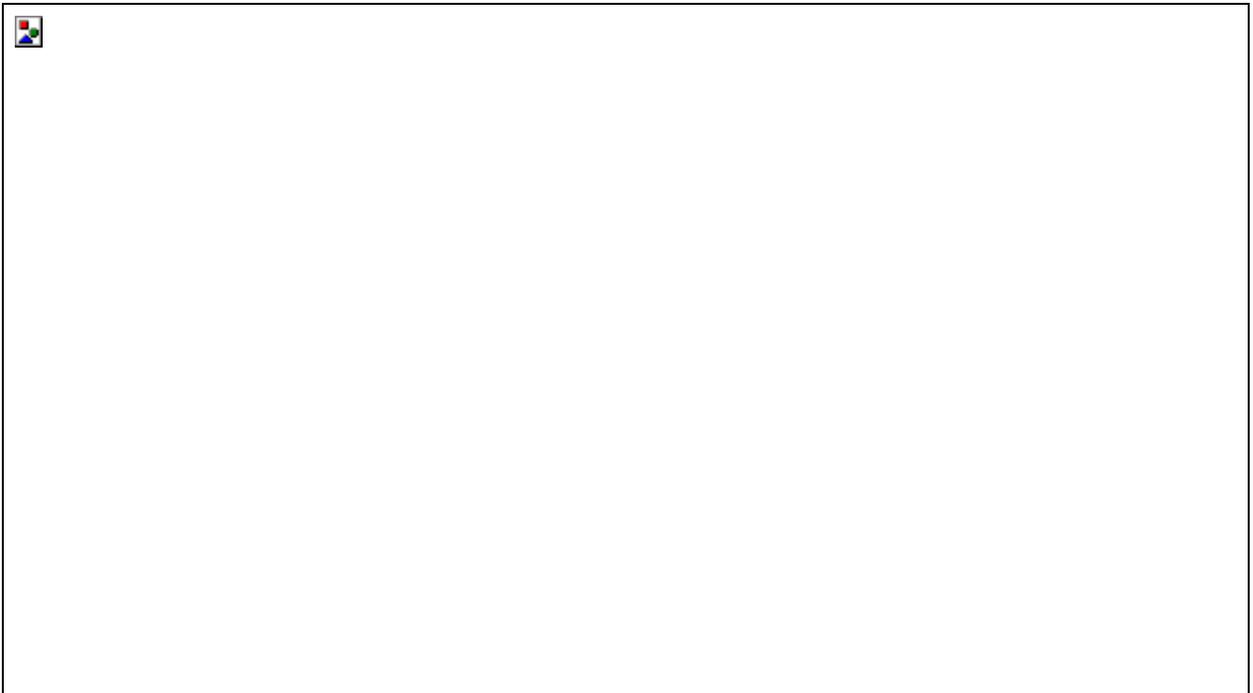
Activity 8-10: City Temperatures (*cont.*)

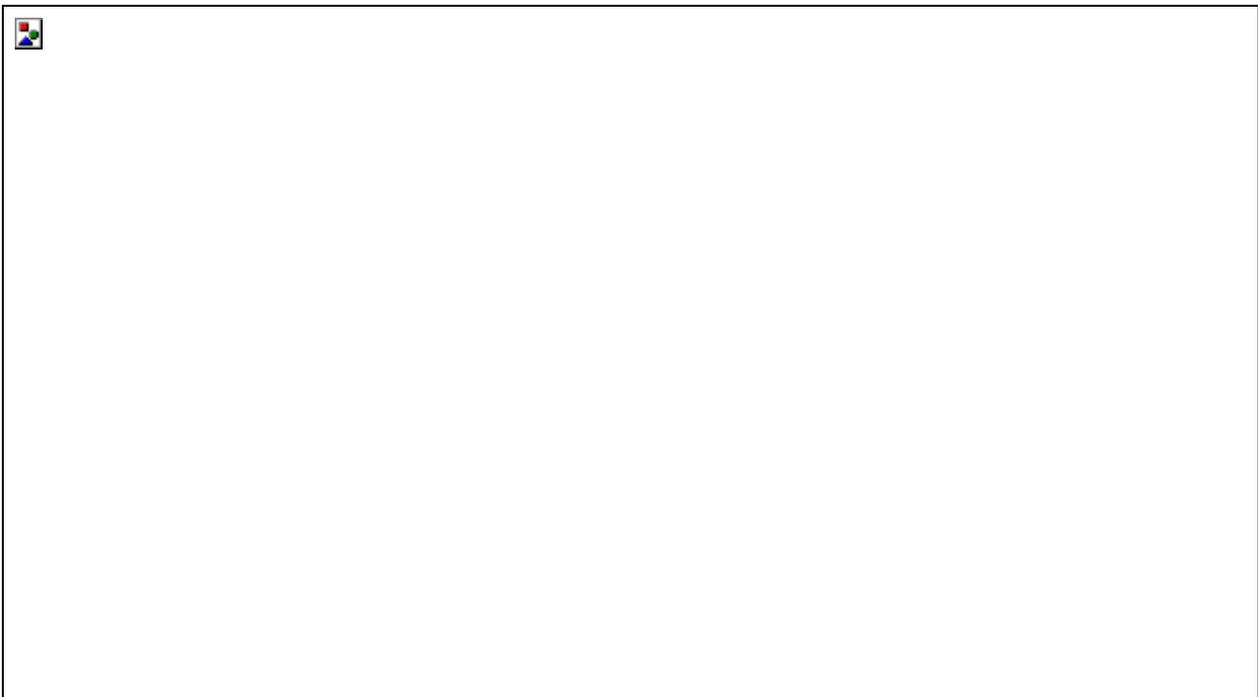
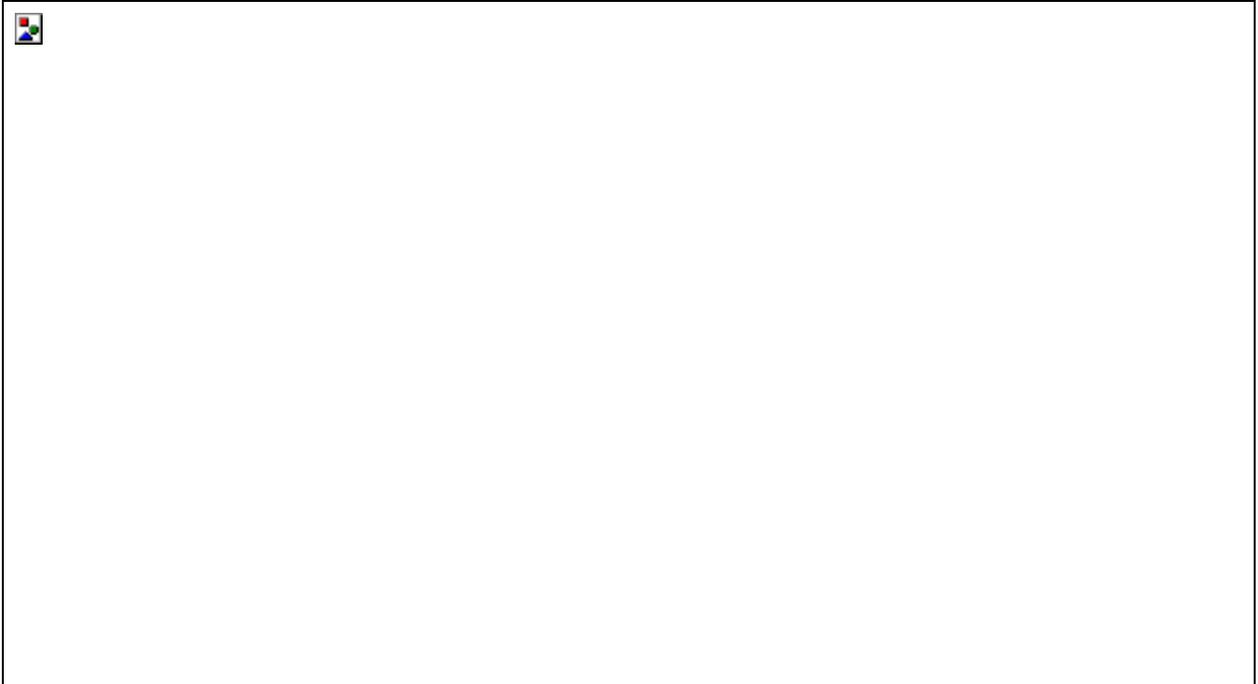
(a) 6; A: the circle is higher than the cross for a particular month; B: the number of dots above the "y = x" line

(b) April, May, June, July, August, September; A

(c) There is a moderate positive association between the two cities' monthly temperatures. It is easier to judge this with graph B because we can see how closely the points fall to a line.

Activity 8-11: Fast Food Sandwiches (*cont.*)





It appears that while the amount of protein looks about the same between roast beef and chicken sandwiches, roast beef sandwiches tend to have more sodium and total fat than chicken sandwiches.

Activity 8-12: Broadway Shows (*cont.*)

(a)



(b) There is a fairly strong positive association between receipts and percentage capacity.

(c) Musicals tend to do make the same or more money than plays of similar percentage capacity (though are only 5 plays)

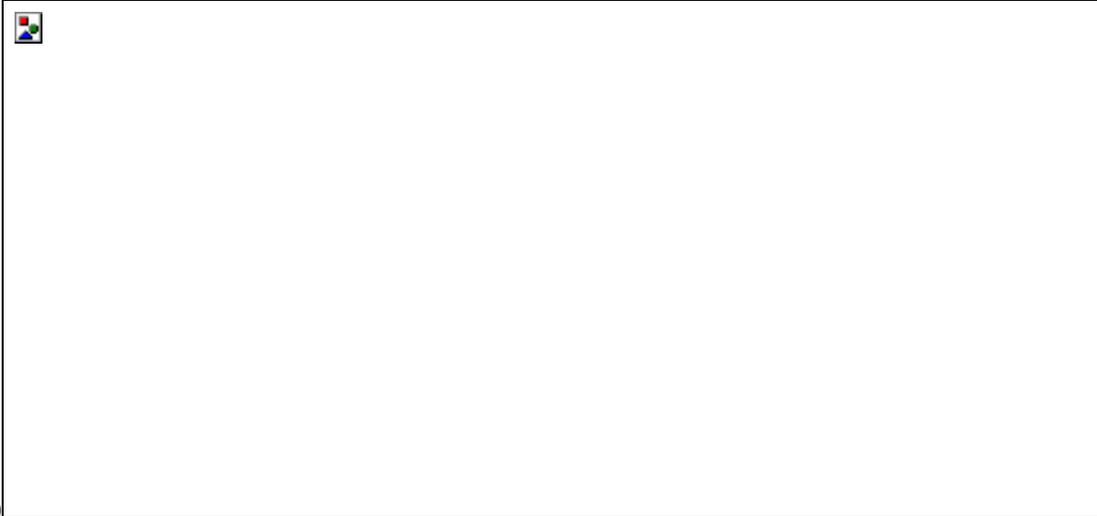
Activity 8-13: Scrabble Names (*cont.*)

Answers will vary from class to class.

Activity 8-14: Signature Measurements (*cont.*)

Answers will vary from class to class

Activity 8-15: College Alumni Donations



(a)

This distribution is very roughly symmetrical. It has one high outlier (Class of 62) at about 81% of the class giving. The peak and center of distribution is at 50-51% of the class giving.



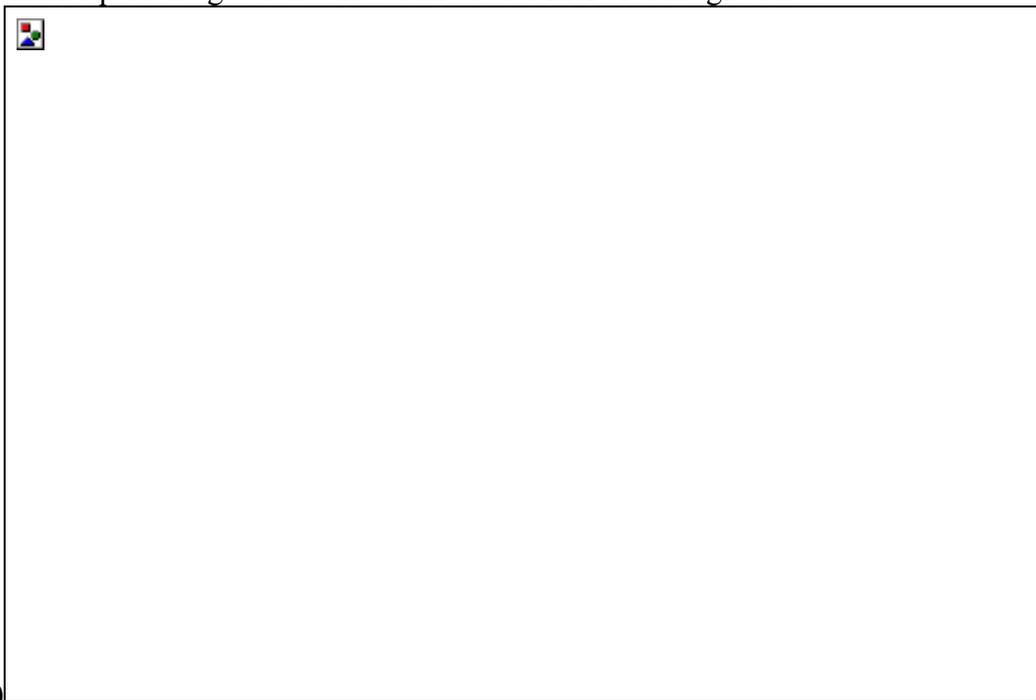
(b)

This distribution is skewed to the right, with one outlier (Class of 62) at about \$12,000. The peak and center of distribution is at about \$400.



(c)

There is a fairly strong negative association between % participation and class year. A smaller percentage of the class donates for more recent graduates.



(d)

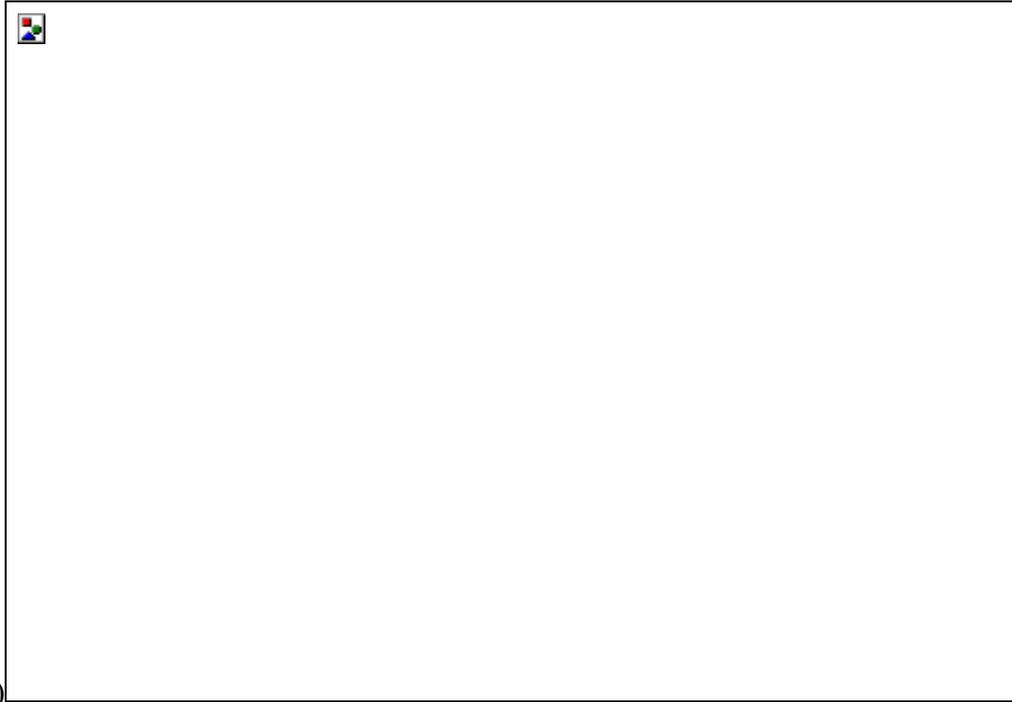
There is no noticable association between average gift and class year. In almost every class year, the average gift was less than \$500.

(e) The class of 1962 had an abnormally high % participation at 81%, as well as an abnormally high average gift at \$12,187. Maybe there was a 25 year reunion drive.

Activity 8-16: Peanut Butter

Answers will vary from student to student.

Activity 8-17: States' SAT Averages (*cont.*)



(a)

There is a moderately strong negative association between average SAT score and the % of students who took the test. It may be the case that in those states where a low percentage of the students take the test, only the more intelligent students took it. Therefore, those states would have high average scores. In those states where there is a high percentage of students who took the test, there will be a wider range of scores. In addition some students who may not want to take the test may be forced to. These factors may force the average score down.

(b) Iowa has the highest SAT average. However, only 5% of Iowa's students took the test. Therefore, I would not conclude from this data that Iowa does the best job of educating its students. South Carolina has the lowest SAT average but 61% of South Carolina's students took the test. I would not conclude from this data that South Carolina does the worst job of educating its students. In addition, SAT scores alone are not good indicators of the quality of a state's educational system.

(c) Answers will vary from student to student.

Activity 8-18: Governors' Salaries

(a) There is a weak positive association between a governor's salary and his/her state's per capita income.

(b) Answers will vary from student to student. Here are some examples:

Alabama & Alaska, California & Colorado, Connecticut & Delaware

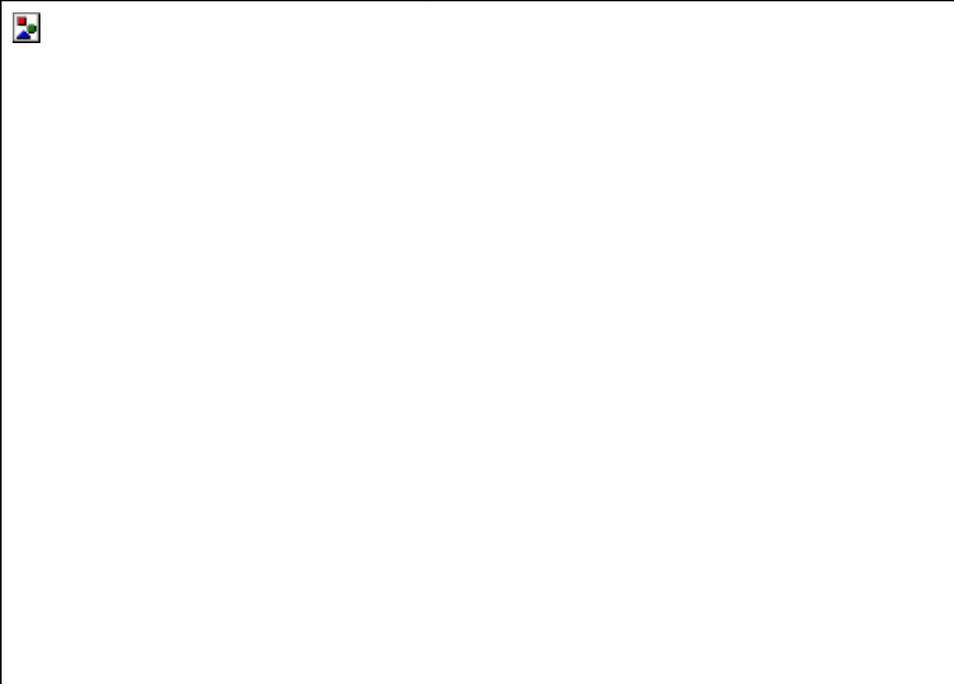
(c) Our answers for (b) show that it is not always true that a state with a higher per capita income has a higher governor's salary. However, it tends to be the case that this association holds true.

(d) California

(e) Connecticut, New Jersey, and Massachusetts; NE

Activity 8-19: Comparison Shopping

(a) observational units: the grocery products



(b)

There is a strong positive association between prices at Lucky's and prices at Von's. The prices fall very close to, when not on, the " $y = x$ " line.

(c) Navel oranges do not fall close to the " $y = x$ " line. According to the data collected, Lucky's sells them for \$6.18/oz, while Von's sells them for only \$4.36/oz. There may be an error in the prices recorded. Or, it could be the case that Von's was having a sale on navel oranges at that time, and Lucky's was not.

Activity 8-20: Variables of Personal Interest (*cont.*)

Answers will vary from student to student.