

Practice Quiz 3

Statistics 200

Fall 2007

Dr. Nancy Pfenning

1. (6 pts.) A used-car buyer compared prices of three-year-old Mercedes Benz and BMW automobiles. These are displayed in a back-to-back stemplot, where leaves represent thousands of dollars.

| Mercedes | | BMW |
|----------|---|--------|
| 86 | 2 | 777889 |
| 22 | 3 | 2234 |
| 98 | 3 | 556677 |
| | 4 | |
| | 4 | |
| 1 | 5 | 134 |

- (a) There are two variables of interest. Tell what they are, what roles they play (explanatory/response), and whether they are quantitative or categorical.
- (b) As far as centers are concerned, which type of cars tend to be more expensive?
(i) Mercedes (ii) BMW (iii) both about the same
- (c) As far as spreads are concerned, which type of cars has more uniform prices?
(i) Mercedes (ii) BMW (iii) both about the same
- (d) As far as shapes are concerned, they are (i) both symmetric
(ii) Mercedes symmetric and BMW skewed
(iii) Mercedes skewed and BMW symmetric (iv) both skewed
- (e) What is the most noticeable difference between the two distributions?
(i) centers (ii) spreads (iii) shapes (iv) sample sizes
- (f) If there were a subtle difference in average price for all cars of the two types, we'd have a better chance of detecting it with (i) smaller (ii) larger samples.
- (g) If there were a subtle difference in average price for all cars of the two types, we'd have a better chance of detecting it if the standard deviations were
(i) small (ii) large.

2. (4 pts.) The U.S. government reported on hate crimes for a recent year, noting whether the offender was black or white and whether or not the crime was due to the victim's sexual orientation. The data are shown in this two-way table.

| | Against Sexual Orientation | Other Reason | Total |
|----------------|----------------------------|--------------|-------|
| White Offender | 680 | 3030 | 3710 |
| Black Offender | 210 | 870 | 1080 |
| Total | 890 | 3900 | 4790 |

- (a) Report the proportions of hate crimes due to sexual orientation for white offenders and for black offenders.
- (b) Compare the proportions and tell whether or not the difference is large enough to convince you that race of the offender plays an important role in whether a hate crime is committed due to the victim's sexual orientation.
- (c) What is considered to be the explanatory variable here?