

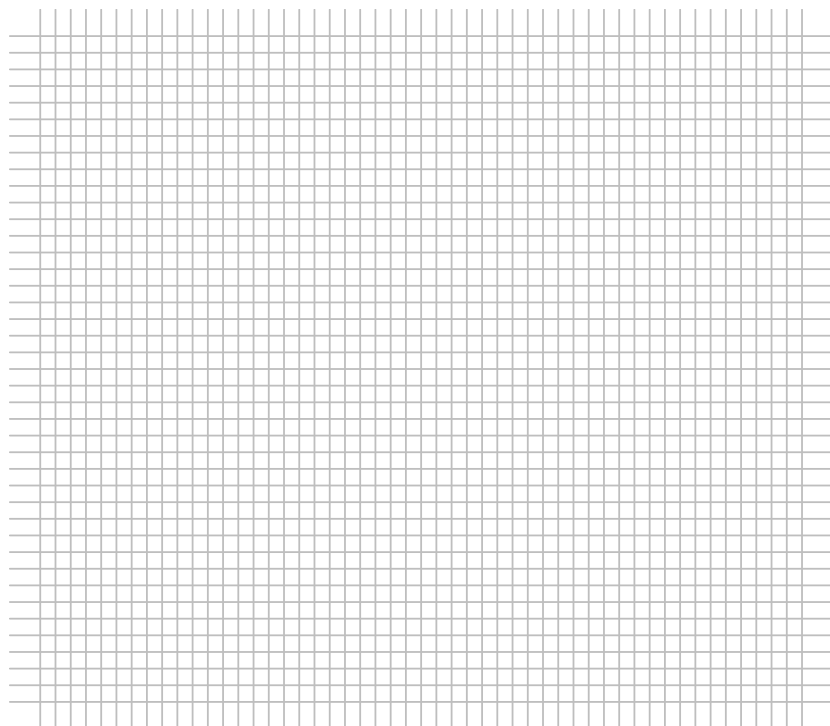
Stat 1040 Recitation packet 5

1. On March 8, 1993 *Newsweek* announced “A really bad hair day: Researchers link baldness and heart attacks”. The article reported that “men with typical male pattern baldness are anywhere from 30 to 300 percent more likely to suffer a heart attack than men with little or no hair loss at all.”. The report was based on a study conducted at the Boston University School of Medicine. They compared 665 men who had been admitted to the hospital with their first heart attack to 772 men who had been admitted for other reasons. They found that 42% of the heart attack victims suffered from male pattern baldness, while only 34% of the men admitted for other reasons suffered from male pattern baldness.

- (a) Is this an example of a controlled experiment or an observational study? Explain.
- (b) Suggest a confounding factor and clearly explain why you think it is a confounding factor.
- (c) If you had access to all the hospital records for these men, what would you do to help alleviate the confounding?

2. The following table summarizes the lengths of 24 male painted turtles. Class intervals include the left endpoint but not the right.

Length (mm)	Number of turtles
90 to 100	3
100 to 110	5
110 to 120	8
120 to 140	8



- (a) Draw a histogram for the data, being careful to label the axes correctly.
- (b) In which interval does the 25th percentile fall?

3. The length of female painted turtles follows the normal curve with an average of 136 mm and an SD of 21 mm.

- (a) If one of these turtles is at the 75th percentile in length, how long is she?
- (b) What percentage of the turtles were more than 150 mm in length?
- (c) A new turtle is included and she is longer than any of the others.
 - i. The average will now be (circle the correct answer, no explanation is required):
 - smaller than before
 - exactly the same as before
 - larger than before
 - ii. The SD will now be (circle the correct answer, no explanation is required):
 - smaller than before
 - exactly the same as before
 - larger than before

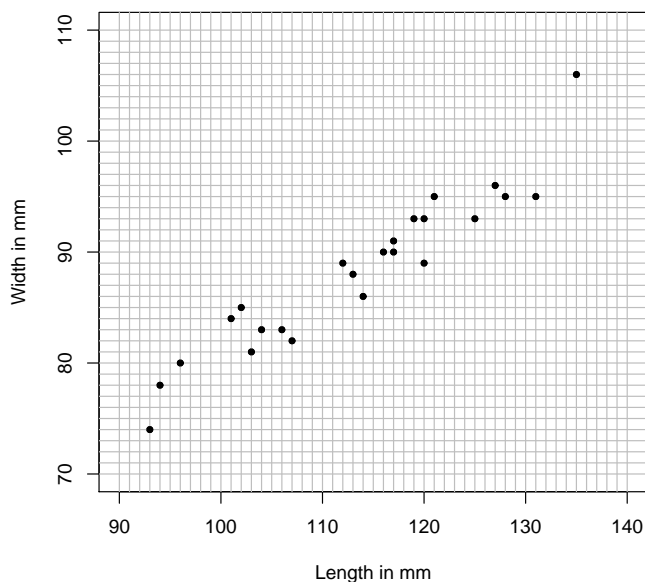
4. In a special “health awareness” program, all university employees are invited to participate in a wellness program in which they get screened for cholesterol, blood pressure, hearing loss, etc. They define high blood pressure as systolic blood pressure over 140 mm and they suggest that any participant with high blood pressure should return for a followup measurement. Other things being equal (stress levels, nerves, etc) do you expect their second systolic blood pressure measurement to be higher, lower, or the about same as their first measurement? Explain.

5. The length and width of 24 male painted turtles have the following summary statistics:

Length: average = 115 mm SD = 12 mm r = 0.95
 Width: average = 90 mm SD = 8 mm

The scatter-diagram is football-shaped.

- (a) Predict the width of a turtle that is 95 mm in length.
- (b) Would you be surprised to find that the turtle in part (a) was 110 mm in width? Explain.
- (c) Draw the regression line.



Memory Aids

Please note that these are provided for your convenience, but it is your responsibility to know how and when to use them.

$$\text{height} = \frac{\text{percentage}}{\text{width}}$$

$$z = \frac{x - \text{ave}}{SD}$$

$$x = \text{ave} + z(SD)$$

$$\text{rms error} = \sqrt{1 - r^2}(SD_Y)$$

$$\text{slope} = r \left(\frac{SD_Y}{SD_X} \right)$$

$$\text{intercept} = \text{ave}_Y - \text{slope} \times \text{ave}_X$$