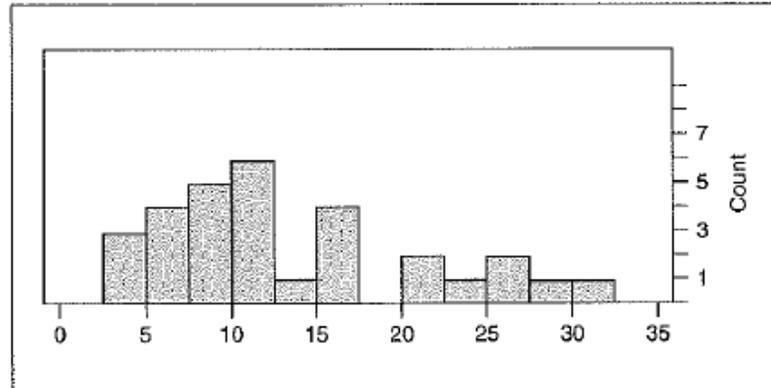


Chapter 2 Review

MULTIPLE CHOICE.

- The following list is ordered from smallest to largest: 25, 26, 25, 30, y , y , y , 33, 150. Which of the following statements is (are) true?
 - The mean is greater than the median.
 - The mode is 26.
 - There are no outliers in the data.
 - I only
 - I and II only
 - III only
 - I and III only
 - II and III only
- Jenny is 5'10" tall and is worried about her height. The heights of girls in the school are approximately normally distributed with a mean of 5'5" and a standard deviation of 2.6". What is the percentile rank of Jenny's height?
 - 59
 - 65
 - 74
 - 92
 - 97
- The mean and standard deviation of a normally distributed dataset are 19 and 4, respectively. 19 is subtracted from every term in the dataset and then the result is divided by 4. Which of the following best describes the resulting distribution?
 - It has a mean of 0 and a standard deviation of 1.
 - It has a mean of 0, a standard deviation of 4, and its shape is normal.
 - It has a mean of 1 and a standard deviation of 0.
 - It has a mean of 0, a standard deviation of 1, and its shape is normal.
 - It has a mean of 0, a standard deviation of 4, and its shape is unknown.
- The five-number summary for a one-variable dataset is {5, 18, 20, 40, 75}. If you wanted to construct a modified boxplot for the dataset (that is, one that would show outliers if there are any), what would be the maximum possible length of the right side "whisker"?
 - 35
 - 33
 - 5
 - 55
 - 53
- A set of 5,000 scores on a college readiness exam are known to be approximately normally distributed with mean 72 and standard deviation 6. To the nearest integer value, how many scores are there between 63 and 75?
 - 0.6247
 - 4,115
 - 3,650
 - 3,123
 - 3,227

6. For the data given in #5 above, suppose you were not told that the scores are approximately normally distributed. What can be said about the number of scores that are less than 58 (to the nearest integer)?
- There are at least 919 scores less than 58.
 - There are at most 919 scores less than 58.
 - There are approximately 919 scores less than 58.
 - There are at most 459 scores less than 58.
 - There are at least 459 scores less than 58.
7. The following histogram pictures the number of students who visited the Career Center each week during the school year.



The shape of this graph could best be described as

- Mound-shape and symmetric
 - Bi-modal
 - Skewed to the left
 - Uniform
 - Skewed to the right
8. Which of the following statements is (are) true?
- The median is resistant to extreme values.
 - The mean is resistant to extreme values.
 - The standard deviation is resistant to extreme values.
- I only
 - II only
 - III only
 - II and III only
 - I and III only
9. One of the values in a normal distribution is 43 and its z-score is 1.65. If the mean of the distribution is 40, what is the standard deviation of the distribution?
- 3
 - 1.82
 - 0.55
 - 1.82
 - 0.55

10. Free-response questions on the AP Statistics Exam are graded on 4, 3, 2, 1, or 0 basis. Question #2 on the exam was of moderate difficulty. The average score on question #2 was 2.05 with a standard deviation of 1. To the nearest tenth, what score was achieved by a student with was at the 90th percentile of all students on the test? You may assume that the scores on the question were approximately normally distributed.
- (a) 3.5
 - (b) 3.3
 - (c) 2.9
 - (d) 3.7
 - (e) 3.1

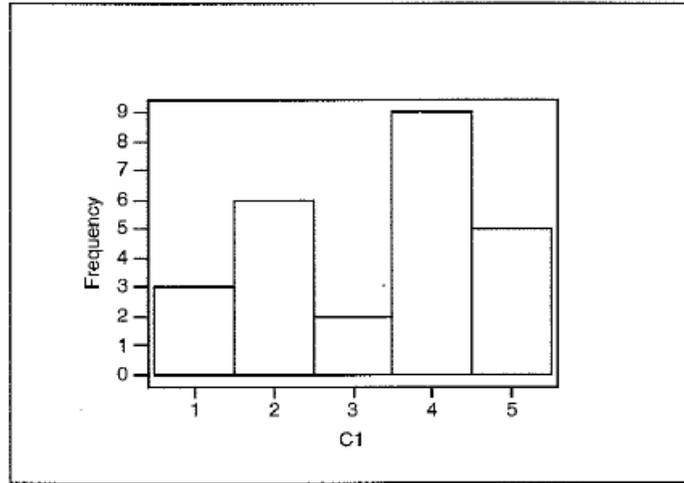
FREE RESPONSE.

1. Mickey Mantle played with the New York Yankees from 1951 through 1968. He had the following number of home runs for those years: 13, 23, 21, 27, 37, 52, 34, 42, 31, 40, 54, 30, 15, 35, 19, 23, 22, 18. Were any of these years outliers? Explain.
2. Which of the following are properties of the normal distribution? Explain your answers.
 - (a) It has a mean of 0 and a standard deviation of 1.
 - (b) Its mean = median = mode.
 - (c) All terms in the distribution lie within four standard deviations of the mean.
 - (d) It is bell-shaped.
 - (e) The total area under the curve and above the horizontal axis is 1.
3. Make a stemplot for the number of home runs hit by Mickey Mantle during his career (see question #1). Do it first using an increment of 10, then do it again using an increment of 5. What can you see in the second graph that was not obvious in the first?
4. A group of 15 students were identified as needing supplemental help in basic arithmetic skills. Two of the students were put through a pilot program and achieved scores of 84 and 89 on a test of basic skills after the program was finished. The other 13 students received scores of 66, 82, 76, 79, 72, 98, 75, 80, 76, 55, 77, 68, 69. Find the z-score for the students in the pilot program and comment on the success of the program.
5. For the 15 students whose scores were given in question #4, find the five-number summary and construct a boxplot of the data. What are the distinguishing features of the graph?
6. Assuming that the batting averages in major league baseball over the years have been approximately normally distributed with a mean of 0.265 and a standard deviation of 0.032, what would be the percentile rank of a player who bats 0.370 (as Barry Bonds did in the 2002 season)?
7. In problem #1 we considered the home runs hit by Mickey Mantle during his career. The following is a stemplot of the number of doubles hit by Mantle during his career. What is the interquartile range (IQR) of this data? (Hint: $n = 18$.)

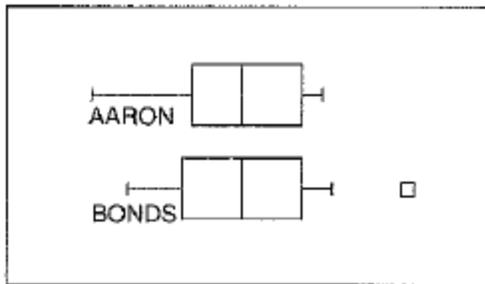
1	0	8
5	1	1224
(5)	1	56777
8	2	1234
4	2	558
1	3	
1	3	7

Note: The column of numbers to the left of the stemplot gives the cumulative frequencies from each end of the stemplot (e.g. there are 5 values, reading from the top, when you finish the second row). The (5) identifies the location of the row that contains the median of the distribution. It is standard for computer packages to draw stemplots in this manner.

8. For the histogram pictured below, what proportion of the terms are less than 3.5?



9. The following graph shows the boxplot for the number of career home runs for Hank Aaron and Barry Bonds. Comment on the graphs. Which player would you rather have on your team *most* seasons? A season in which you needed a *lot* of home runs?



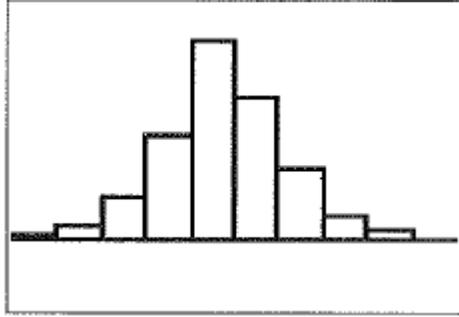
10. Suppose that being in the top 20% of people with high blood cholesterol level is considered dangerous. Assume that cholesterol levels are approximately normally distributed with mean 185 and standard deviation 25. What is the maximum cholesterol level you can have and not be in the top 20%?
11. The following are salaries, in millions of dollars, for members of the 2001-2002 Golden State Warriors: 6.2, 5.4, 5.4, 4.9, 4.4, 4.4, 3.4, 3.3, 3.0, 2.4, 2.3, 1.3, .3, .3. Which gives a better “picture” of these salaries, mean-based or median-based statistics? Explain.
12. The following tables gives the results of an experiment in which the age of 524 pennies from current change were recorded. “0” represents the current year, “1” represents pennies one year old, etc.

Age	0	1	2	3	4	5	6	7	8	9	10	11
Count	163	87	52	75	44	24	36	14	11	5	12	2

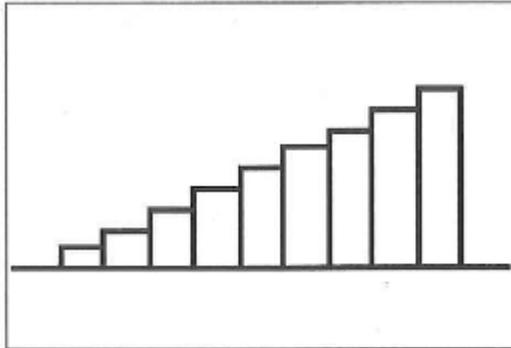
Describe the distribution of ages of pennies (remember the instruction “describe” means to discuss center, spread, and shape). Justify your answer.

13. A wealthy woman is trying to decide whether or not to buy a coin collection that contains 1450 coins. She will buy the collection only if at least 225 of the coins are worth more than \$170. The present owner of the collection reports that the average coin in the collection is worth \$130 with a standard deviation of \$15. Should the woman buy the collection?
14. The mean of a set of 150 values is 35, its median is 33, its standard deviation is 6, and its IQR is 12. A new set is created by first subtracting 10 from every term and then multiplying by 5. What are the mean, median, variance, standard deviation, and IQR of the new set?

15. The following graph shows the distribution of heights of 300 women whose average height is 65" and whose standard deviation is 2.5". Assume that the heights of women are approximately normally distributed. How many of the women would you expect to be less than 5'2" tall?



16. Which of the following are properties of the *standard deviation*? Explain your answer.
- It's the square root of the average squared deviation from the mean.
 - It's resistant to extreme values.
 - It's independent of the number of terms in the distribution.
 - If you added 25 to every value in the dataset, the standard deviation wouldn't change.
 - The interval $\bar{x} \pm 2s$ contains 50% of the data in the distribution.
17. Look again at the salaries of the Golden State Warriors in question 11. Erick Dampier was the highest paid player at \$6.2 million. What sort of raise would he need so that his salary would be an *outlier* among these salaries?
18. Given the histogram below, draw, as best you can, the boxplot for the same data.



19. On the first test of the semester, the class average was 72 with a standard deviation of 6. On the second test, the class average was 65 with a standard deviation of 8. Nathan scored 80 on the first test and 76 on the second. Compared to the rest of the class, on which test did Nathan do better?
20. What is the mean of the set of data where $s = 20$, $\sum x = 245$, and $\sum(x - \bar{x})^2 = 13,600$?