1. Determine whether the statement describes a population or a sample.
   The heights of all the corn plants at Mr. Lonardo's greenhouse.

2. Determine whether the statement describes a population or a sample.
   The number of hours a group of 7 children in Mrs. Smith's kindergarten class watch television in a day.

3. Identify the population being studied and the sample chosen.
   The number of times 15 out of 30 students on your floor order take-out in a week.

4. Determine if the numerical value describes a population parameter or a sample statistic.
   79% of all students at the local university voted in the last election.

5. Determine if the numerical value describes a parameter or a statistic.
   A recent poll of 1628 home owners in Ohio showed that the average price of a house in the U.S. is $322,000.

6. The heights of 48 randomly selected female students.
   Please indicate if the given data are a. qualitative or quantitative, b. discrete or continuous. c. Also indicate the highest level of measurement associated with the given data.

7. Your rating on a scale of 1 to 10 on the quality of a course.
   Please indicate if the given data are a. qualitative or quantitative, b. discrete or continuous. c. Also indicate the highest level of measurement associated with the given data.

8. A survey response to the question "did you vote in the last election?"
   1) Yes  2) No
   Please indicate if the given data are a. qualitative or quantitative, b. discrete or continuous. c. Also indicate the highest level of measurement associated with the given data.
9. Birth years of your family.

Please indicate if the given data are a. qualitative or quantitative, b. discrete or continuous. c. Also indicate the highest level of measurement associated with the given data.

10. An experiment in which only the participant does not realize whether they have been placed in the experimental or control group is ________.

11. When conducting a single-masked experiment a doctor should not apply a process to produce a desired response to the ________.

12. A car wash operator wants to know if commuters frequent her establishment often.

Determine whether an observational or experimental study is appropriate to address the statement above.

13. A deli cart entrepreneur wants to identify if using a new cleaning product will reduce staffing costs.

Determine whether an observational or experimental study is appropriate to address the statement above.

14. A disaster planner compares three weather reports from hurricanes to compare for common factors.

Classify this scenario as a meta-analysis or a case study.

15. Test each member of the entire population.

Identify the sampling technique used for the study above.

16. A statistics student chooses thirty members of the sampling frame at random from each zoning district.

Identify the sampling technique used for the study above.
17. Consider the following frequency table representing the distribution of the price of a candy bar (in dollars).

<table>
<thead>
<tr>
<th>Price of a Candy Bar (in Dollars)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.27 – 0.34</td>
<td>4</td>
</tr>
<tr>
<td>0.35 – 0.42</td>
<td>14</td>
</tr>
<tr>
<td>0.43 – 0.50</td>
<td>4</td>
</tr>
<tr>
<td>0.51 – 0.58</td>
<td>10</td>
</tr>
<tr>
<td>0.59 – 0.66</td>
<td>8</td>
</tr>
</tbody>
</table>

**Step 1.** Determine the relative frequency for the third class as a simplified fraction.
Answer: ______________

**Step 2.** Determine the relative frequency for the second class as a simplified fraction.
Answer: ______________

18. Consider the following frequency table representing the distribution of hours students watch tv in a week.

<table>
<thead>
<tr>
<th>Hours Students Watch TV in a Week</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 – 8</td>
<td>3</td>
</tr>
<tr>
<td>9 – 14</td>
<td>11</td>
</tr>
<tr>
<td>15 – 20</td>
<td>15</td>
</tr>
<tr>
<td>21 – 26</td>
<td>10</td>
</tr>
<tr>
<td>27 – 32</td>
<td>15</td>
</tr>
</tbody>
</table>

**Step 1.** Determine the cumulative frequency for the fourth class.
Answer: ______________

**Step 2.** Determine the cumulative frequency for the third class.
Answer: ______________
19. Consider the following data representing the price of refrigerators (in dollars).

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>Frequency</td>
<td>Class</td>
<td>Frequency</td>
<td>Class</td>
<td>Frequency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boundaries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1105</td>
<td>1180</td>
<td>1056</td>
<td>1102</td>
<td>1295</td>
<td>1313</td>
</tr>
<tr>
<td>1146</td>
<td></td>
<td>1248</td>
<td>1133</td>
<td>1059</td>
<td>1352</td>
</tr>
<tr>
<td>1317</td>
<td>1111</td>
<td>1025</td>
<td>1252</td>
<td>1357</td>
<td>1062</td>
</tr>
<tr>
<td>1331</td>
<td></td>
<td>1125</td>
<td>1270</td>
<td>1362</td>
<td>1103</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1312</td>
<td>1317</td>
<td>1111</td>
<td>1025</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1125</td>
<td>1270</td>
<td>1362</td>
<td>1103</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1312</td>
<td>1317</td>
<td>1111</td>
<td>1025</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Price of Refrigerators (in Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1012</td>
</tr>
<tr>
<td>1072</td>
</tr>
<tr>
<td>1132</td>
</tr>
<tr>
<td>1192</td>
</tr>
<tr>
<td>1252</td>
</tr>
<tr>
<td>1312</td>
</tr>
</tbody>
</table>

**Step 1.** Determine the class width of the data given.
Answer: ______________

**Step 2.** Determine the frequency of the sixth class.
Answer: ______________

**Step 3.** Determine the lower class boundary for the fourth class.
Answer: ______________

**Step 4.** Determine the upper class boundary for the first class.
Answer: ______________

**Step 5.** Identify the midpoint of the fifth class.
Answer: ______________

**Step 6.** Calculate the relative frequency of the second class. Enter your answer as a simplified fraction.
Answer: ______________

**Step 7.** Compute the cumulative frequency of the third class.
Answer: ______________
20. The following bar graph shows the circulation totals for six popular magazines in 2005. Use this bar graph to answer the questions.

**Step 1.** Determine the lowest total circulation of the six magazines.

**Answer:**

![Bar graph showing circulation totals for six magazines in 2005.]

**Step 2.** Determine the highest total circulation of the six magazines.

**Answer:**

![Bar graph showing circulation totals for six magazines in 2005.]

**Answer:**
The Pizza Pie 'N Go sells about 1300 one-topping pizzas each month. The pie chart displays the most requested one-topping pizzas, by percentage, for one month. Round-off your answers to the nearest integer.

**Step 1.** Determine the number of Anchovy pizzas sold each month.

Answer: ______________

**Step 2.** Determine the number of Sausage pizzas sold each month.
Answer: ______________

**Step 3.** Determine the number of Ground Beef pizzas sold each month.
Answer: ______________

**Step 4.** Determine the number of Mushroom pizzas sold each month.
Answer: ______________

**Step 5.** Determine the number of Bell Pepper pizzas sold each month.
Answer: ______________
Barbara has accumulated $170000 in savings and wishes to invest this money sensibly. The types of investments and their corresponding percentages, recommended by a financial advisor, are shown in the following pie chart. Round-off your answers to the nearest hundredth.

**Step 1.** Determine the amount of money that Barbara should invest in Annuities.

![Pie chart showing investments]

Answer: $ \underline{ }$

**Step 2.** Determine the amount of money that Barbara should invest in Stocks.

Answer: ______________

**Step 3.** Determine the amount of money that Barbara should invest in Bonds.

Answer: ______________

**Step 4.** Determine the amount of money that Barbara should invest in Mutual Funds.

Answer: ______________

**Step 5.** Determine the amount of money that Barbara should invest in Real Estate.

Answer: ______________
23. Construct a bar graph that represents the following State Combined SAT Score Averages data.

<table>
<thead>
<tr>
<th>State</th>
<th>SAT Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>1,145</td>
</tr>
<tr>
<td>Minnesota</td>
<td>1,183</td>
</tr>
<tr>
<td>Virginia</td>
<td>1,006</td>
</tr>
<tr>
<td>Alaska</td>
<td>1,041</td>
</tr>
<tr>
<td>Ohio</td>
<td>1,076</td>
</tr>
</tbody>
</table>

24. Construct a pie chart that represents the following data concerning the reasons for an increase in traffic.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in trip lengths</td>
<td>29%</td>
</tr>
<tr>
<td>Increase in population</td>
<td>33%</td>
</tr>
<tr>
<td>Less carpooling</td>
<td>13%</td>
</tr>
<tr>
<td>Increase in trips taken</td>
<td>10%</td>
</tr>
<tr>
<td>Other</td>
<td>15%</td>
</tr>
</tbody>
</table>

25. Construct a Pareto chart that represents the following State Combined SAT Score Averages data.

<table>
<thead>
<tr>
<th>State</th>
<th>SAT Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>1,127</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>1,175</td>
</tr>
<tr>
<td>Oregon</td>
<td>1,056</td>
</tr>
<tr>
<td>Florida</td>
<td>1,001</td>
</tr>
<tr>
<td>Colorado</td>
<td>1,079</td>
</tr>
</tbody>
</table>
26. The following data set represents the distribution of ages in a group of people.

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 19</td>
<td>3</td>
</tr>
<tr>
<td>20 – 29</td>
<td>9</td>
</tr>
<tr>
<td>30 – 39</td>
<td>4</td>
</tr>
<tr>
<td>40 – 49</td>
<td>8</td>
</tr>
<tr>
<td>50 – 59</td>
<td>6</td>
</tr>
</tbody>
</table>

Which of the following is a correct histogram?

27. Which of the following is true?

A) This data could be displayed by a histogram.
B) This data could not be displayed by a histogram because the intervals overlap.
C) This data could not be displayed by a histogram because at least one of the intervals is of indeterminate width.
D) This data could not be displayed by a histogram because the intervals are of different widths.
28. The following histogram represents the distribution of scores on a ten point quiz.

**Step 1.** Which score has the highest frequency?

![Histogram](image)

**Answer:**

**Step 2.** What is the frequency corresponding to a score of 7?

**Answer:** ______________

**Step 3.** What is the total number of people who made a score between 0 and 2 inclusive?

**Answer:** ______________
29. The following line graph shows the combined SAT score averages for Oregon from 1994 - 1998. Use this line graph to answer the questions. Round-off your answers to the nearest integer.
The SAT score averages in order, are as follows:
1028, 1047, 1044, 1049, 1056

**Step 1.** Determine the lowest combined SAT score average.

**Step 2.** Determine the highest combined SAT score average.

Answer: ______________

**Step 2.** Determine the highest combined SAT score average.

Answer: ______________
30. Construct a histogram that represents the following personality questionnaire data.

<table>
<thead>
<tr>
<th>Class</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 − 23</td>
<td>4</td>
</tr>
<tr>
<td>24 − 29</td>
<td>6</td>
</tr>
<tr>
<td>30 − 35</td>
<td>8</td>
</tr>
<tr>
<td>36 − 41</td>
<td>5</td>
</tr>
<tr>
<td>42 − 47</td>
<td>6</td>
</tr>
</tbody>
</table>

31. The following data represent the starting salaries for 24 entry-level accountants at different firms.

$45,300 $42,600 $42,300 $45,000 $46,900 $44,600

$42,300 $45,300 $44,200 $45,500 $43,800 $45,200

$43,800 $43,100 $42,600 $46,100 $46,600 $42,700

$45,800 $46,600 $45,400 $42,200 $43,200 $46,700

Create a Stem-and Leaf Plot and Create the key to be used in interpreting the stem-and-leaf plot
32. Find the mean, median, and mode of the following data. Use the rounding rules for calculating the mean and median. Separate multiple answers with commas, if necessary.

   Rate of Fatal Alcohol Impaired Car Crashes per 100 Million Vehicle Miles of Travel

   0.47 0.60 0.78 0.76 0.50
   0.45 0.49 0.33 0.61 0.72
   0.58 0.54 0.71 0.44 0.54
   0.38 0.65 0.29 0.50 0.47

33. For the following type of data set mentioned, determine the most appropriate measure of center.

   A company has given you the task to research the pay scale of actors in the movies. Would you be more interested in looking at the mean, median, or mode?

   Answer: A) Mean  B) Median  C) Mode

34. Consider the following data:

   10, 14, 11, 14, 3, 8

   **Step 1.** Find the value of the mean.
   Answer: ______________

   **Step 2.** Find the value of the median.
   Answer: __________

   **Step 3.** Select the number of modes and indicate the modes if any. Separate multiple modes with commas.
   Answer: A) No Mode  B) Unimodal  C) Bimodal  D) Multimodal

35. Consider the following data:

   13, −2, −2, −2, 13, 13, −5

   **Step 1.** Find the value of the sample variance. Round your answer to one decimal place.
   Answer: ______________

   **Step 2.** Find the value of the sample standard deviation. Round your answer to one decimal place.
   Answer: ______________

   **Step 3.** Find the value of the range.
   Answer: ______________
36. Decide if the following statement is true or false. Explain why. It is possible to have a standard deviation of $-1$ for some data set.

37. Donna is looking into investing a portion of her recent bonus into the stock market. While researching different companies, she discovers the following standard deviations of one year of daily stock closing prices.

- Garden Statues Express: Standard deviation of stock prices = $1.22$
- El Lobo Malo Incorporated: Standard deviation of stock prices = $9.62$

Based on the data and assuming these trends continue, which company would give Donna a stable long-term investment?
38. Calculate the sample standard deviation and sample variance for the following frequency distribution of heart rates for a sample of American adults.

<table>
<thead>
<tr>
<th>Class</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>61 – 66</td>
<td>4</td>
</tr>
<tr>
<td>67 – 72</td>
<td>8</td>
</tr>
<tr>
<td>73 – 78</td>
<td>5</td>
</tr>
<tr>
<td>79 – 84</td>
<td>7</td>
</tr>
<tr>
<td>85 – 90</td>
<td>13</td>
</tr>
</tbody>
</table>

Answer: Sample standard deviation: 

Sample variance: 

39. Consider the following sets of sample data:
A: $36,900, $19,400, $22,200, $21,900, $35,300, $20,500, $35,400, $24,000, $37,700, $35,300, $38,300, $29,600, $26,000, $38,400
B: 2.1, 5.0, 3.5, 3.7, 2.5, 2.1, 3.7, 4.6, 2.7, 4.1, 1.7

Step 1. For each of the above sets of sample data, calculate the coefficient of variation, CV.

Answer: CV for Data Set A: %

CV for Data Set B: %

Step 2. Which of the above sets of sample data has the smaller spread?

Answer: A) Data Set A

B) Data Set B
The mean salary at a local industrial plant is $29,600 with a standard deviation of $5700. The median salary is $25,300 and the 59th percentile is $30,200.

**Step 1.** Approximately 59% of the salaries are above $30,200.
A) True \hspace{1cm} B) False

**Step 2.** Joe's salary of $37,580 is 1.40 standard deviations above the mean.
A) True \hspace{1cm} B) False

**Step 3.** The percentile rank of $25,700 is 50.
A) True \hspace{1cm} B) False

**Step 4.** Approximately 9% of the salaries are between $25,300 and $30,200.
A) True \hspace{1cm} B) False

**Step 5.** If Tom's salary has a z-score of 0.6, how much does he earn (in dollars)?
Answer: ____________

Calculate the five-number summary of the given data.
14, 23, 14, 8, 14, 18, 4, 3, 17, 2, 9, 7, 3, 6

Determine if there is an outlier in the given data. If yes, please state the value(s) that are considered outliers. Use the approximation method.
40, 33, 2, 31, 40, 23, 26, 45, 28, 43, 31, 16, 54, 41

If more than one outlier exists, write the values below, separating the answers with a comma.
Answer: ____________
43. Construct a box plot from the given data. Use the approximation method.
Scores on a Statistics Test: 55, 71, 49, 89, 53, 79, 80, 87, 47, 46

Answer: ______________

44. Given the following box plot, choose the best description of the distribution.

Answer: A) The distribution of the data is skewed left.
B) The distribution of the data is skewed right.
C) The distribution of the data is symmetric.

45. Calculate the standard score of the given $x$ value, $x = 29.4$, where $\mu = 26.9$ and $\sigma = 7$. Round your answer to two decimal places.

Answer: ______________

46. Three potential employees took an aptitude test. Each person took a different version of the test. The scores are reported below.
Brittany got a score of 88.3; this version has a mean of 63.1 and a standard deviation of 14.
Alissa got a score of 236.5; this version has a mean of 219 and a standard deviation of 25.
Tera got a score of 7.75; this version has a mean of 6.6 and a standard deviation of 0.5.
If the company has only one position to fill and prefers to fill it with the applicant who performed best on the aptitude test, which of the applicants should be offered the job?

Answer: A) Brittany
B) Alissa
C) Tera