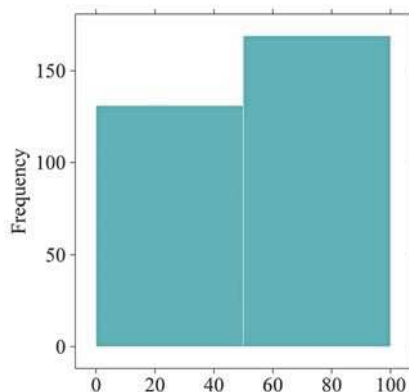


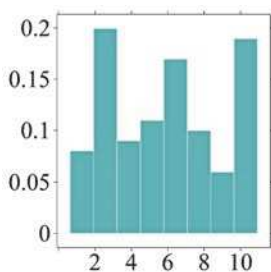
## Chapter 2 Test B - Multiple Choice

### Section 2.1 (Visualizing Variation in Numerical Data)

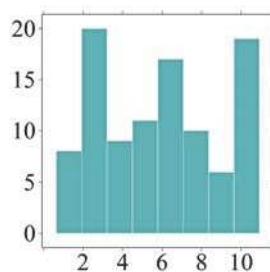
1. [Objective: Determine significance of bin width in a histogram.] In the following histogram, what can you conclude about the bin width?



- The bin width is too small. We are given too much detail.
  - The bin width is too large. We are given too much detail.
  - The bin width is too small. We are hiding details of the distribution.
  - The bin width is too large. We are hiding details of the distribution.
2. [Objective: Understand the difference between frequencies and relative frequencies in a histogram.] The two histograms below display the exact same data. How do the plots differ?



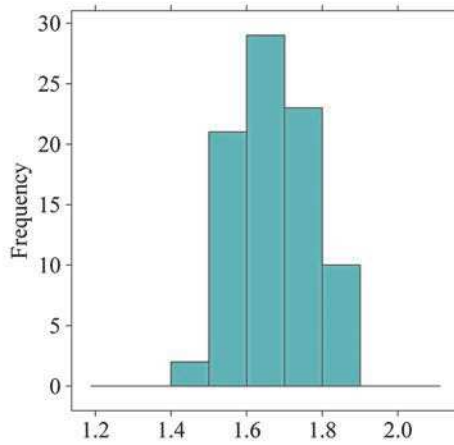
(i)



(ii)

- Histogram (i) uses frequencies to simply count the number of observations at a given value. Histogram (ii) uses relative frequencies to show the proportion of observations at a given value.
- Histogram (i) uses relative frequencies to show the proportion of observations at a given value. Histogram (ii) uses frequencies to simply count the number of observations at a given value.
- Histograms (i) and (ii) are exactly the same; there are no differences between the plots.
- Histograms (i) and (ii) do not display the same data because the values listed on the  $y$ -axis do not match.

3. [Objective: Understand the difference between how observations are recorded in dotplots and stemplots.] How are individual observations recorded in a dotplot versus a stemplot?
- A dotplot displays the actual values of observations. A stemplot uses bars to display intervals of observations.
  - A dotplot displays the actual values of observations. A stemplot displays a dot for every observation.
  - A dotplot displays a dot for every observation. A stemplot displays the actual values of observations.
  - A dotplot displays a dot for every observation. A stemplot uses bars to display intervals of observations.
4. [Objective: Understand that a distribution of a sample of data can be displayed multiple ways.] Which dotplot represents the same data as the histogram shown below?

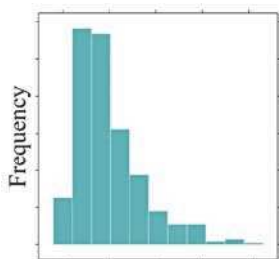


- a.
- b.
- c.
- d.

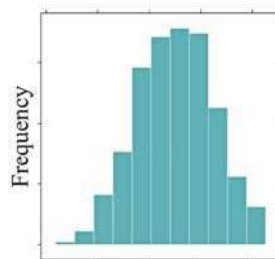
**Section 2.2 (Summarizing Important Features of a Numerical Distribution)**

5. [Objective: Know what to pay attention to in distributions of numerical data.] When examining distributions of numerical data, what three components should you look for?
- Shape, center, and spread
  - Shape, symmetry, and spread
  - Symmetry, skewness, and spread
  - Symmetry, center, and spread
6. [Objective: Understand modality in distributions.] Which of the following would likely show a bimodal distribution in a histogram?
- The midterm exam scores for an introduction to Spanish course.
  - The ages of students who attend a local high school.
  - The number of hours a college student spends on homework per night.
  - The price of college tuition, including both public and private schools.

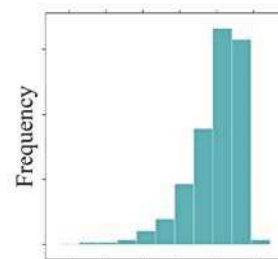
For questions (7) - (9), match one of the histograms below with its appropriate description.



a.



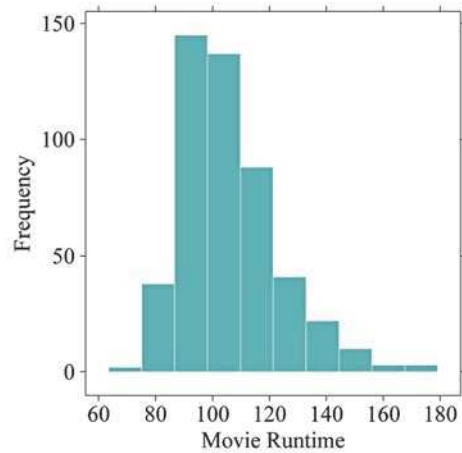
b.



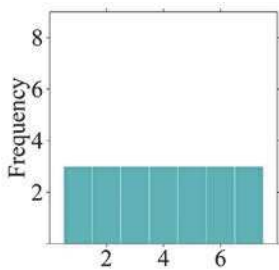
c.

7. [Objective: Recognize the shape of a distribution.]  
The distribution of test scores for a group of students who received a 15-minute study session prior to taking a test is displayed in histogram \_\_\_\_.
8. [Objective: Recognize the shape of a distribution.]  
The distribution of male heights is displayed in histogram \_\_\_\_.
9. [Objective: Recognize the shape of a distribution.]  
The distribution of the number of “friends” users of a popular social media site has is displayed in histogram \_\_\_\_.

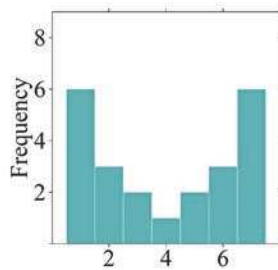
10. [Objective: Understand how to find typical values from a histogram.] The following histogram represents the movie runtimes (length of a movie in minutes) of 489 movies. What is the *typical* movie runtime according to this distribution?



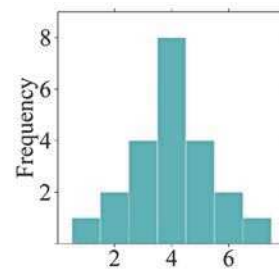
- a. The typical value is about 90.  
 b. The typical value is about 100.  
 c. The typical value is about 120.  
 d. The typical value is about 130.
11. [Objective: Determine differences in variability.] Order the following histograms from most to least variability.



(i)



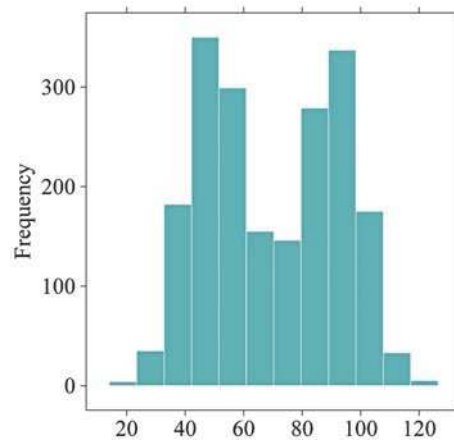
(ii)



(iii)

- a. (i), (ii), (iii)  
 b. (ii), (i), (iii)  
 c. (ii), (iii), (i)  
 d. (iii), (i), (ii)

12. [Objective: Interpreting typical values of bimodal distributions.] What is the typical value for the histogram shown below?

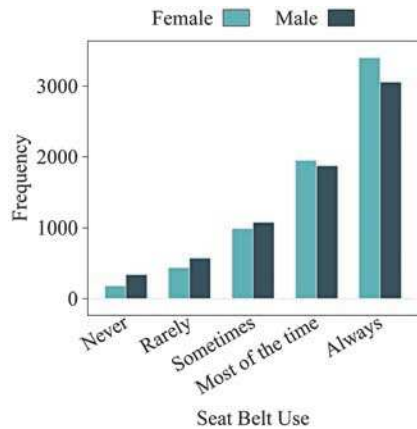


- The typical value is 70 because it is the average of 50 and 90.
- The typical value is 70 because it is the center of the distribution.
- Since the data are bimodal, a typical value cannot be found.
- Since the data are bimodal, there are two typical values - one is about 50 and the other is about 90.

### ***Section 2.3 (Visualizing Variation in Categorical Variables)***

13. [Objective: Understand differences between bar charts and histograms.] What is the difference between a bar chart and a histogram?
- A bar chart represents categorical data and a histogram represents numerical data.
  - A bar chart represents numerical data and a histogram represents categorical data.
  - They can both be used to represent categorical data.
  - They can both be used to represent numerical data.

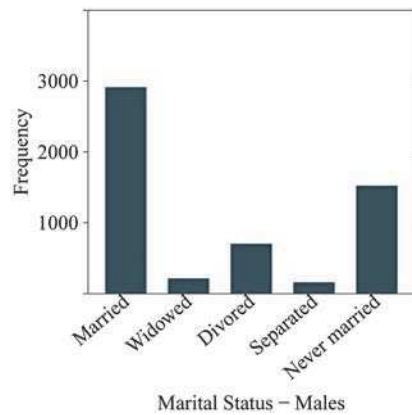
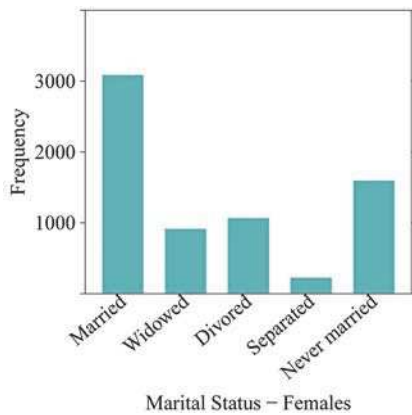
14. [Objective: Interpreting bar charts.] Which statement below is NOT supported by the following bar chart?



- a. In general, people always wear seat belts.
- b. About 2000 people wear seat belts “sometimes.”
- c. More females wear seat belts compared to males.
- d. More males wear seat belts compared to females.

**Section 2.4 (Summarizing Categorical Distributions)**

15. [Objective: Determine the variability of categorical data from a bar chart.] The bar charts below depict the marital statuses of Americans, separated by gender. Which bar chart shows more variability in marital status? Why?



- a. The female bar chart shows more variability because many of the observations fall into one category (“Married”).
- b. The female bar chart shows more variability because there are more observations in the different categories than there are for males.
- c. The male bar chart shows more variability because many of the observations fall into one category (“Married”).
- d. The male bar chart shows more variability because there are more observations in the different categories than there are for females.

16. [Objective: Understand the term *mode* when describing categorical variables.] What does it mean to find the *mode* of a bar chart?
- The mode can be found by finding the bar, or category, with the most observations.
  - You cannot find a mode for categorical data. Modes are only used with numerical data.
  - The mode can be found by adding up the total number of observations and dividing by the number of categories.
  - The mode can be found by adding up the total number of categories.

### ***Section 2.5 (Interpreting Graphs)***

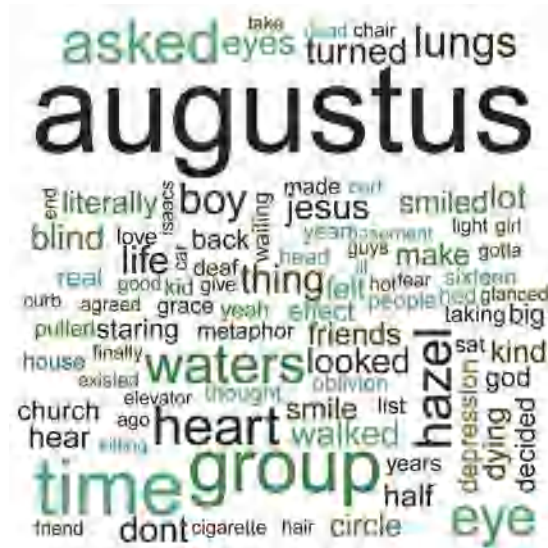
Use the following information to answer questions (17) - (18):

A large state university conducted a survey among their students and received 400 responses. The survey asked the students to provide the following information:

- \* Age
- \* Year in School (Freshman, Sophomore, Junior, Senior)
- \* Major

17. [Objective: Determine appropriate graph based on variable type.] What type of graph would you use to describe the variable Major?
- A histogram because Major is a numerical variable.
  - A histogram because Major is a categorical variable.
  - A bar chart because Major is a numerical variable.
  - A bar chart because Major is a categorical variable.
18. [Objective: Determine appropriate graph based on variable type.] What type of graph would you use to describe the variables Major and Year in School?
- A side-by-side bar chart should be used since these are two categorical variables.
  - A side-by-side bar chart should be used since these are two numerical variables.
  - A side-by-side histogram should be used since these are two categorical variables.
  - A side-by-side histogram should be used since these are two numerical variables.

A word cloud was created using the first chapter of John Green's The Fault in Our Stars. (Note that filler words such as “the,” “a/an,” and “and” were excluded from the plot.) Use the word cloud to answer questions (19) - (20).



19. [Objective: Interpreting word clouds.] According to the word cloud, which is the most common word in the first chapter of The Fault in Our Stars? Why?
  - a. The most common word is “thing” because it appears in the middle of the cloud.
  - b. The most common word is “augustus” because he is a main character in the story.
  - c. The most common word is “hazel” because that is the narrator’s name.
  - d. The most common word is “augustus” because it is the largest in size.
  
20. [Objective: Pitfalls of using word clouds.] What information is NOT explicitly portrayed in the word cloud?
  - a. The words that occur most frequently in the chapter.
  - b. The number of times each word occurs.
  - c. The specific word that occurs most often.



**Chapter 2 Test B - Answer Key**

1. D
2. B
3. C
4. D
5. A
6. D
7. C
8. B
9. A
10. B
11. B
12. D
13. A
14. D
15. B
16. A
17. D
18. A
19. D
20. B