These questions should help you review many of the concepts and techniques we've learned so far in STT 201. There are a lot of questions; do them whenever you wish. Most are in the multiple-choice format that will be on the exam; a few are short answer format. Solutions will be posted on the course website as soon as possible. Other good sources of review problems are the weekly quizzes.

Below is a stem-and-leaf plot of the number of home runs that Babe Ruth hit during each of his 15 years with the New York Yankees. Use it to answer the following 3 questions.

```
 2 | 25
 3 | 45
 4 | 1166679
 5 | 449
 6 | 0
```

1. What is the median number of home runs?
   (a) 49  (b) 46.5  (c) 46  (d) 44  (e) The median is not computable from the stem-and-leaf plot.

**Solution.** The median is 46.

2. What is the mean number of home runs?
   (a) 49  (b) 46.5  (c) 46  (d) 44  (e) The mean is not computable from the stem-and-leaf plot.

**Solution.** From the stem-and-leaf plot we can recover the actual data. For example, the first five home run values are 22, 25, 34, 35, 41. To compute the mean, just add all the values and divide by 15:

\[
\frac{22 + 25 + 34 + 35 + 41 + 41 + 46 + 46 + 46 + 47 + 49 + 54 + 54 + 59 + 60}{15} = \frac{659}{15} \approx 43.93.
\]

3. Suppose that Babe Ruth played another year, and hit 20 home runs. Would the median change?
   (a) YES  (b) NO  (c) NOT POSSIBLE TO ANSWER WITH THE INFORMATION GIVEN

**Solution.** The median would still be 46. This time we would have to average the two “middle” numbers, but both of them are 46, so the average is 46.

Here is a frequency table of student opinions about the living conditions in off-campus apartments. Use it to answer the following 2 questions.

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very desirable</td>
<td>32</td>
</tr>
<tr>
<td>Desirable</td>
<td>60</td>
</tr>
<tr>
<td>Sufficient</td>
<td>160</td>
</tr>
<tr>
<td>Livable</td>
<td>120</td>
</tr>
<tr>
<td>Undesirable</td>
<td>28</td>
</tr>
</tbody>
</table>

4. What is the relative frequency of the opinion “Sufficient”?
   (a) 50%  (b) 40%  (c) 16%  (d) 1.6%  (e) 32%
**Solution.** Add the frequencies to see that the total number of student opinions is 400. So the relative frequency of “Sufficient” is 160/400 = 40%.

5. The variable “Opinion” is
(a) Numerical (discrete)  (b) Numerical (continuous)  (c) Categorical

**Solution.** Categorical.

6. An official for the National Football League is interested in the proportion of all football fans who believe that instant replay improves officiating. To learn more about this proportion, the official selects 1000 football fans at random and asks their opinion; 35% say they believe that instant replay improves officiating. In this context, 35% is
(a) a parameter  (b) a statistic  (c) a sample  (d) none of the above

**Solution.** Since the number 35% is computed from the sample, it is a statistic.

The following 4 questions refer to the following description: A coin is tossed four times, and the outcome of each toss is recorded. A sample space for this experiment is given by $S = \{\text{HHHH}, \text{HHHT}, \text{HHTH}, \text{HHTT}, \text{HTHH}, \text{HTHT}, \text{HTTH}, \text{HTTT}, \text{THHH}, \text{THHT}, \text{THTH}, \text{THTT}, \text{TTHH}, \text{TTHT}, \text{TTTH}, \text{TTTT}\}$. Assume that each of the 16 outcomes has probability $1/16$.

7. What is the probability that exactly 3 of the 4 tosses result in HEADS?
(a) 1/16  (b) 4/16  (c) 7/16  (d) 3/16

**Solution.** The outcomes that lead to exactly 3 HEADS are $\text{HHHT, HHTH, HTTH, THHH}$. Since there are 4, and each has probability 1/16, the probability of exactly 3 HEADS is $4/16$.

8. What is the probability that less than 3 of the 4 tosses result in HEADS?
(a) 3/16  (b) 11/16  (c) 5/16  (d) 15/16  (e) none of the above

**Solution.** There are 11 outcomes that lead to either 0, 1, or 2 HEADS, so the probability is 11/16.

9. Let $Y$ represent the difference between the number of HEADS and the number of TAILS in the 4 tosses. (So if the outcome is HHTH, Y is equal to 3-1 = 2.) What are the possible values of $Y$?
(a) 0, 1, 2, 3, 4  (b) -1, 0, 1  (c) -2, -1, 0, 1, 2  (d) -4, -3, -2, -1, 0, 1, 2, 3, 4  (e) none of the above

**Solution.** The possible numbers of HEADS and TAILS are listed in the following table.

<table>
<thead>
<tr>
<th>HEADS</th>
<th>TAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

So the possible values of $Y$ are $-4, -2, 0, 2, 4$. 
10. Let $X$ represent the number of HEADS in the 4 tosses. The mean of $X$ is
(a) 4  (b) 2  (c) 1.57  (d) 0.001  (e) none of the above

**Solution.** The random variable $X$ is Binomial with $n = 4$ and $\pi = 1/2$. So the mean of $X$ is $n\pi = 4(1/2) = 2$.

The next 2 questions refer to the following description: The salary schedule for teachers in a school district has five steps. The frequency distribution for the 500 teachers in the district according to salary is

<table>
<thead>
<tr>
<th>Step</th>
<th>Salary</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$25000</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>$28000</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>$35000</td>
<td>200</td>
</tr>
<tr>
<td>4</td>
<td>$45000</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>$55000</td>
<td>60</td>
</tr>
</tbody>
</table>

11. A teacher is chosen at random. What is the probability that his salary is more than $40000? 
(a) .40  (b) .28  (c) .12  (d) .72  (e) .32

**Solution.** There are 100 + 60 = 160 teachers with a salary over $40000. So the probability is $160/500 = 0.32$.

12. What is the median salary for the 500 teachers? (a) $25000  (b) $28000  (c) $35000  (d) $40000  (e) $45000

**Solution.** The median salary is $35000.

The next 3 questions refer to the following description: A large university has 60% female students and 40% male students. A group of 7 students is chosen at random. Let $F$ denote female and $M$ denote male.

13. What is the probability of the outcome FFFFFFFF? 
(a) 0.0078  (b) 0.00164  (c) 0.02799  (d) 0.19595

**Solution.** The probability is $(0.6)^7 \approx 0.02799$.

14. What is the probability of getting exactly 3 females in the group of 7? 
(a) 0.1935  (b) 0.00553  (c) 0.00164  (d) 0.35652

**Solution.** The number $X$ of females is binomial with $n = 7$ and $\pi = 0.6$. So

$$P(X = 3) = \frac{7!}{3!4!} (0.6)^3(0.4)^4 = 35(0.216)(0.0256) \approx 0.1935.$$  

15. How many outcomes (an outcome is a string of 7 Ms and Fs) are there which have exactly 5 Fs? 
(a) 83  (b) 35  (c) 42  (d) 21  (e) none of the above
Solution. This is what the factor 
\[ \frac{n!}{k!(n-k)!} \]
at the front of the binomial probability formula counts. In this problem we have \( n = 7 \) and \( k = 5 \), so the answer is 
\[ \frac{7!}{5!2!} = 21. \]

16. A jury of 10 people is to be selected at random from the population of a large city. Of the people in the city, 20000 have college educations while the remaining 80000 do not. Compute the probability that the proportion of college-educated people on the jury is the same as the proportion of college-educated people in the city.

(a) 0.2000 (b) 0.30199 (c) 0.69873 (d) 0.00671

Solution. The number \( X \) of the 10 people who are college-educated can be modeled by a binomial distribution with \( n = 10 \) and \( \pi = \frac{20000}{100000} = 0.2 \). We want 20% of the 10 to be college-educated, so we want \( X = 2 \). Using the binomial probability formula, we get
\[ P(X = 2) = \frac{10!}{2!8!}(0.2)^2(0.8)^8 \approx 0.30199. \]

17. A system is constructed of two components, A and B, connected in series, so that the system works if and only if both of the components are working. The probability that component A works is known to be 0.7; the probability that component B works is known to be 0.8. In addition, the probability that the system works is known to be 0.56. Are the events “component A works” and “component B works” independent?

(a) Yes (b) No (c) Theres not enough information to answer the question

Solution. Let \( A = \) “component A works” and \( B = \) “component B works.” If \( P(A \text{ and } B) = P(A)P(B) \) then the events \( A \) and \( B \) are independent. In our case, since \( P(A \text{ and } B) = 0.56 = (0.8)(0.7) = P(A)P(B) \), the events are independent. Another way to check this is to compute \( P(A \mid B) \) and show that it is equal to \( P(A) \). 

18. A system is constructed of two components, A and B, connected in parallel, so that the system works as long as at least one of the two components is working. The probability that component A works is known to be 0.7; the probability that component B works is known to be 0.8. In addition, it is known that the events “component A works” and “component B works” are independent. What is the probability that the system works?

(a) 0.56 (b) 0.89 (c) 0.94 (d) 0.7 (e) 0.8

Solution. Let \( A = \) “component A works” and \( B = \) “component B works.” We want \( P(A \text{ or } B) \) which is always equal to \( P(A) + P(B) - P(A \text{ and } B) \). Since the events \( A \) and \( B \) are independent, \( P(A \text{ and } B) = P(A)P(B) = (0.7)(0.8) = 0.56 \). So the answer is \( 0.7 + 0.8 - 0.56 = 0.94. \)

The next 4 questions refer to the following description: The age in months (\( x \)) and height in cm (\( y \)) of 12 children is given in the following table:
<table>
<thead>
<tr>
<th>Age ($x$)</th>
<th>Height ($y$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>76.1</td>
</tr>
<tr>
<td>19</td>
<td>77.0</td>
</tr>
<tr>
<td>20</td>
<td>78.1</td>
</tr>
<tr>
<td>21</td>
<td>78.2</td>
</tr>
<tr>
<td>22</td>
<td>78.8</td>
</tr>
<tr>
<td>23</td>
<td>79.7</td>
</tr>
<tr>
<td>24</td>
<td>79.9</td>
</tr>
<tr>
<td>25</td>
<td>81.1</td>
</tr>
<tr>
<td>26</td>
<td>81.2</td>
</tr>
<tr>
<td>27</td>
<td>81.8</td>
</tr>
<tr>
<td>28</td>
<td>82.8</td>
</tr>
<tr>
<td>29</td>
<td>83.5</td>
</tr>
</tbody>
</table>

A line was fit to the data by least squares. The slope of the line is $b_1 = 0.635$ and the intercept of the line is $b_0 = 64.93$.

19. Use the line to predict the height of a child who is 27.5 months old.
(a) 82.3  (b) 82.3925  (c) 28.543  (d) 17.4625

**Solution.** Just plug $x = 27.5$ into the formula $b_0 + b_1 x$ for the least squares line to get the answer, $64.93 + (0.635)(27.5) = 82.3925$.  

20. Based on the line, how much does height increase when age increases by 3 months?
(a) 0.635  (b) 1.905  (c) 2.000  (d) 194.79  (e) 66.835

**Solution.** Every month increase in age corresponds to a $b_1 = 0.635$ increase in height, according to the line. So the answer is $3(0.635) = 1.905$.

21. The correlation coefficient between age and height is closest to: (you might find a plot of the data helpful)
(a) $-0.895$  (b) $-0.025$  (c) $0.07$  (d) $0.983$

**Solution.** We know that the correlation coefficient is positive, since the slope of the least squares line is positive. Draw a scatter plot of the data to see that the points cluster very tightly about a line, so the correlation coefficient is close to 1. The only answer that fits is 0.983.

22. The residual for the data point with age equal to 21 months is
(a) 0.30  (b) $-0.06$  (c) 0.635  (d) 17.4625

**Solution.** First compute the predicted value, $64.93 + 0.635 * 21 = 78.265$. Now subtract this from the data value for $y$ when $x = 21$: $78.2 - 78.265 = -0.065$.

The next 3 questions refer to the following description: The following table gives the socioeconomic status (high, middle, low) and smoking behavior (current, former, or never smoked) of a group of 356 people:

<table>
<thead>
<tr>
<th>Current</th>
<th>high</th>
<th>middle</th>
<th>low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Former</td>
<td>51</td>
<td>22</td>
<td>43</td>
</tr>
<tr>
<td>Never</td>
<td>92</td>
<td>21</td>
<td>28</td>
</tr>
</tbody>
</table>

| Never   | 68   | 9      | 22  |
23. How many people in the data set have never smoked?
(a) 68  (b) 99  (c) 211  (d) 356  (e) none of the above

Solution. This is the sum of the counts in the “Never” row: 68 + 9 + 22 = 99.

24. Of those people who are former smokers, what proportion are in a low socioeconomic status?
(a) 0.079  (b) 0.301  (c) 0.199  (d) none of the above

Solution. There are 92 + 21 + 28 = 141 former smokers. Of these, 28 are in a low socioeconomic status, so the answer is 28/141 ≈ 0.199.

The next 5 questions refer to the following description: A random sample of 750 students found that 225 believed that “making more money” is the most important reason for going to college.

25. Compute a 98% confidence interval for \( \pi \), the proportion of all students who believe that making more money is the most important reason for going to college.
(a) .30 ± .0328  (b) .30 ± .0389  (c) .30 ± .00065  (d) .30 ± .0522

Solution. We use the formula \( p \pm c \sqrt{p(1-p)/n} \) where \( c = 2.33 \) is found from the standard normal table, B.2. From the information given, \( p = 225/750 = 0.30 \) and \( n = 750 \). So the answer is

\[
0.30 \pm 2.33\sqrt{0.3(0.7)/750} \approx 0.30 \pm 0.0389.
\]

26. How many students would be needed in the random sample to ensure that a 98% confidence interval would have margin of error of .02 or less?
(a) 59  (b) 8  (c) 3394  (d) 16384  (e) 797

Solution. Use the formula

\[
n = \frac{c^2(0.5)(0.5)}{B^2}
\]

with \( c = 2.33 \) and \( B = 0.02 \) to get \( n = 3393.062 \). Round up to 3394.

27. The population proportion \( \pi \) is
(a) unknown  (b) .30

Solution. Unknown. The sample proportion is 0.30.

28. Compute the p-value for testing the null hypothesis that \( \pi = 0.28 \) versus the alternative hypothesis that \( \pi \neq 0.28 \).

Solution. The test statistic is

\[
\frac{0.30 - 0.28}{\sqrt{0.28(0.72)/750}} \approx 1.22.
\]

The p-value is twice the area to the right of 1.22 under the standard normal density. The area to the right of 1.22 is 0.1112, so the p-value is 0.2224.
29. Based on the test, would you reject the null hypothesis at level $\alpha = 0.05$?

**Solution.** No, since the p-value of 0.2224 is not less than $\alpha = 0.05$.

The next 4 questions refer to the following description: The length in days of human pregnancies is normally distributed with mean $\mu = 266$ and standard deviation $\sigma = 16$.

30. What proportion of human pregnancies last for more than 282 days?
(a) .8413 (b) .6826 (c) .1587 (d) .9999

**Solution.** Let $X$ be the length of a randomly selected woman’s pregnancy. Then $X$ has a normal distribution with $\mu = 266$ and $\sigma = 16$, so the probability is

$$P(X > 282) = P \left( \frac{X - 266}{16} > \frac{282 - 266}{16} \right) = P(Z > 1)$$

where $Z$ has a standard normal distribution. From the standard normal table, this probability is 0.1587.

31. What proportion of human pregnancies last for between 250 and 282 days?
(a) .8413 (b) .6826 (c) .1587 (d) .9999

**Solution.** Let $X$ be the length of a randomly selected woman’s pregnancy. Then $X$ has a normal distribution with $\mu = 266$ and $\sigma = 16$, so the probability is

$$P(250 < X < 282) = P \left( \frac{250 - 266}{16} < \frac{X - 266}{16} < \frac{282 - 266}{16} \right) = P(-1 < Z < 1)$$

where $Z$ has a standard normal distribution. From the standard normal table, this probability is $0.8413 - 0.1587 = 0.6826$.

32. What is the number $y$ such that exactly 15% of human pregnancies are shorter than $y$?
(a) $y = 249.36$ (b) $y = 282.64$ (c) $y = 268.40$ (d) 263.60

**Solution.** We want the 15th percentile of the normal distribution with mean 266 and standard deviation 16. First we’ll compute the 15th percentile of the standard normal distribution from the standard normal table. It is $-1.04$, so the answer is $(-1.04)(16) + 266 = 249.36$.

33. A random sample of 25 pregnant women is monitored, and the lengths of their pregnancies are measured. What is the probability that the mean length of the 25 pregnancies is longer than 270 days?
(a) .8944 (b) .1056 (c) .4013 (d) .598

**Solution.** The mean length $\overline{X}$ has a normal distribution with mean $\mu = 266$ and standard deviation $\sigma/\sqrt{n} = 16/\sqrt{25} = 3.2$. So the answer is

$$P(\overline{X} > 270) = P \left( \frac{\overline{X} - 266}{3.2} > \frac{270 - 266}{3.2} \right) = P(Z > 1.25) = 0.1056.$$
The next 4 questions refer to the following description: A random sample of 11 males are chosen to participate in a fitness study. At the beginning of the study, each of the males has his Body Mass Index (BMI) measured. The mean of the 11 BMIs is 26.83, and the standard deviation of the 11 BMIs is 2.84. For the purposes of the next three questions, assume that BMIs are normally distributed.

34. Compute a 95% confidence interval for the mean body mass index $\mu$ of all males. (a) $26.83 \pm 1.908$  (b) $26.83 \pm 1.678$  (c) $26.83 \pm 1.552$  (d) $26.83 \pm 6.328$

**Solution.** Use the formula $\bar{X} \pm c(S/\sqrt{n})$ with $c = 2.228$ from the $n-1 = 10$ degrees of freedom row of the t-table. This gives
$$26.83 \pm 2.228(2.84/\sqrt{11}) \approx 26.83 \pm 1.908.$$

35. Another person computed a 92% confidence interval from the same data. Would it be (a) narrower  (b) wider  (c) the same width as the 95% interval computed above?

**Solution.** Since the confidence level is lower, the interval will be narrower.

36. Another person computed a 97% confidence interval for $\mu$ and got the interval (24.66, 28.99). Which of the following statements are correct interpretations of the interval? (i) Approximately 97% of males have BMI between 24.66 and 28.99.  (ii) If many people repeated the study, about 97% would get sample means between 24.66 and 28.99.  (a) Statements (i) and (ii) are both correct interpretations.  (b) Statement (i) is a correct interpretation, but Statement (ii) is not.  (c) Statement (ii) is a correct interpretation, but Statement (i) is not.  (d) Neither Statement (i) nor Statement (ii) are correct interpretations.

**Solution.** Neither is correct. A correct interpretation would be something like “If many people repeated the study, about 97% would get confidence intervals that contain the true mean BMI $\mu$.”

37. Compute the p-value for testing the null hypothesis that $\mu$ is less than or equal to 26 versus the alternative hypothesis that $\mu$ is greater than 26.

**Solution.** The test statistic is
$$\frac{26.83 - 26}{2.84/\sqrt{11}} \approx 0.97.$$Since the alternative hypothesis specifies that $\mu > 26$, the p-value is the area to the right of 0.97 under a $t$ density with $n-1 = 10$ degrees of freedom. From Table B.3 we know that the area to the right of 0.879 is 0.2 and the area to the right of 1.372 is 0.1, so the p-value is somewhere between 0.1 and 0.2.

The next 3 questions refer to the following description: Suppose that 15% of South Dakota residents agree with the statement “Newt Gingrich is the leading intellectual of his generation.” A random sample of 350 South Dakota residents is chosen. Let $p$ represent the proportion of the 350 residents who agree with the statement.

38. What is the mean of $p$?  (a) 52.5  (b) .1275  (c) .0191  (d) .15
39. What is the standard deviation of $p$?
(a) .000364  (b) .15  (c) .0191  (d) .15

Solution. The standard deviation of $p$ is $\sqrt{\pi(1-\pi)/n}$ which is $\sqrt{0.15(0.85)/350} \approx 0.0191$.

40. What is the probability that $p$ is greater than .15?
(a) .50  (b) .1587  (c) .0093  (d) .6826

Solution. We know that $p$ is approximately normally distributed with mean 0.15 and standard deviation 0.0191 (from the previous two answers). So the answer is

$$P(p > 0.15) = P\left(\frac{p - 0.15}{0.0191} > \frac{0.15 - 0.15}{0.0191}\right) = P(Z > 0)$$

where $Z$ is standard normal. This probability is 0.5. (If we were thinking, we would have know this without doing any computations, since the distribution of $p$ is symmetric about 0.15.)

41. Compute a 99% confidence interval for $\mu$.
(a) (32418, 37582)  (b) (28364, 41636)  (c) (28984, 41016)  (d) (29939, 40061)

Solution. A 99% confidence interval for $\mu$ is given by

$$35000 \pm 2.57 \frac{10000}{\sqrt{15}} \approx (28364, 41636).$$

Note that the multiplier $c = 2.57$ comes from the standard normal table (Table B.2) because we know the population standard deviation $\sigma$.

42. If 500 people repeated the study, each time computing a 99% confidence interval, how many of the intervals would you expect to NOT contain $\mu$?
(a) 1  (b) 10  (c) 5  (d) 990  (e) 99

Solution. We’d expect 99% of the intervals to contain $\mu$, so we’d expect 1% to not contain $\mu$. Since 1% of 500 is 5, the answer is 5.

The next 3 questions refer to the following description: An air pollution index was recorded for 10 randomly selected days during the summer in a large city. The data were entered into MINITAB in a variable called Air, and the following was the output of the Stat > Basic Statistics > Descriptive Statistics command. We are interested in $\mu$, the mean air pollution index for the whole summer. Assume throughout these problems that the population distribution is normal.
### Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Tr Mean</th>
<th>StDev</th>
<th>SE Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>10</td>
<td>63.70</td>
<td>58.00</td>
<td>63.13</td>
<td>22.15</td>
<td>7.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min</th>
<th>Max</th>
<th>Q1</th>
<th>Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>34.00</td>
<td>98.00</td>
<td>44.75</td>
<td>89.75</td>
</tr>
</tbody>
</table>

43. Compute a 98% confidence interval for $\mu$.
   (a) $63.70 \pm 19.76$  (b) $63.70 \pm 6.24$  (c) $63.70 \pm 2.15$  (d) $63.13 \pm 19.76$  (e) $63.13 \pm 22.15$.

**Solution.** A 98% confidence interval is

$$63.70 \pm 2.821(22.15/\sqrt{10}) \approx 63.70 \pm 19.76.$$  

The multiplier $c = 2.821$ comes from the $n - 1 = 9$ degrees of freedom row of the t-table, Table B.3.

44. Compute the p-value for testing the null hypothesis that $\mu$ is equal to 60 versus the alternative hypothesis that $\mu$ is not equal to 60, and make a decision at the level $\alpha = 0.10$.

**Solution.** The test statistic is

$$t_{obs} = \frac{63.70 - 60}{22.15/\sqrt{10}} \approx 0.53.$$  

Comparing this with the values in the $n - 1 = 9$ degree of freedom row of Table B.3 we find that the area to the right of 0.53 is more than 0.2, so the p-value is more than 0.4. (We double the area to the right since the alternative hypothesis is two-sided.) Since the p-value is more than 0.10, we would not reject $H_0$ at the level $\alpha = 0.10$.

45. In the context of the previous problem, suppose that the mean $\mu$ is actually equal to 60. Was the decision you made a Type I error, Type II error, or not an error?

**Solution.** Since the mean is 60, $H_0$ is true. We didn’t make an error.