

1. Last week, one particular lawyer at the law firm of Dewey, Cheatham, and Howe produced 36 billable hours. Each item in the table below indicates one billable hour of activity (research, consultation, or court appearance) performed.

Research	Research	Consultation	Consultation	Consultation	Court	Court	Court	Consultation
Research	Research	Research	Consultation	Consultation	Consultation	Research	Research	Consultation
Consultation	Consultation	Research	Consultation	Consultation	Research	Court	Court	Consultation
Court	Research	Consultation	Consultation	Consultation	Consultation	Consultation	Court	Consultation

A) Prepare a frequency distribution. Include frequencies and relative frequencies.

B) Sketch both a bar graph and pie chart for your distribution in (A) above.

2. Use the *gas price* data set (see [Additional Datasets](#)) to answer the following.

Our author says that you decide for yourself how many classes to use when constructing a frequency distribution for a quantitative variable. Other authors recommend that you use the expression  $2^c \geq n$  to determine the number of classes, where  $c$  is the number of classes to use and  $n$  is the number of observations in the data set. For example, for a data set with 10 observations, the  $2^c \geq n$  guideline would yield  $2^c \geq 10$ , so  $c$  would be 4 ( $2^4 \geq 10$ ).

A) What would be an appropriate *number of classes* to use when constructing a frequency distribution for the gas price data set? Show your calculations.

B) What minimum *interval width* would be required under your recommendation in part A? Show your calculations.

C) Complete the following table. Carry your calculations to 4 decimal digits.

Class Limits	Class Frequency	Class Midpoint	Relative Frequency	Cumulative Frequency	Cumulative Relative Frequency
47.0 - 48.9					
49.0 - 50.9					
51.0 - 52.9					
53.0 - 54.9					
55.0 - 56.9					

D) Sketch the histogram.

E) Provide a stem & leaf plot.

3. Refer to the *exam score* data set (see [Additional Datasets](#))

- A) Produce a scatter diagram plot of *Absences* and *Exam Score*. Place absences on the horizontal (x) axis.
- B) Draw in a trend line for the sample data. Describe the apparent relation between *Absences* and *Exam Score*.

4. Hormel Anti-SPAM is a software filter that scans each incoming email message, attempts to determine whether the message is spam or legitimate, and either blocks or allows the message. In order to evaluate its performance, 24 test messages were sent to an email account that used Hormel anti-SPAM software.

Message#	True Status	Filter Result	
1.	Spam	Blocked	<p>A) Construct a crosstabulation (contingency table). Mimic the format on page 64.</p> <p>B) What <i>proportion</i> of the messages were legitimate?</p> <p>C) What <i>proportion</i> of legitimate messages were blocked?</p> <p>D) What <i>proportion</i> of actual Spam messages were blocked?</p> <p>D) What <i>proportion</i> of messages were processed correctly?</p>
2.	Spam	Blocked	
3.	Legitimate	Allowed	
4.	Legitimate	Blocked	
5.	Legitimate	Allowed	
6.	Spam	Blocked	
7.	Legitimate	Allowed	
8.	Legitimate	Allowed	
9.	Spam	Blocked	
10.	Legitimate	Allowed	
11.	Legitimate	Allowed	
12.	Spam	Allowed	
13.	Legitimate	Allowed	
14.	Legitimate	Allowed	
15.	Spam	Allowed	
16.	Spam	Blocked	
17.	Legitimate	Allowed	
18.	Legitimate	Blocked	
19.	Legitimate	Allowed	
20.	Spam	Allowed	
21.	Spam	Blocked	
22.	Legitimate	Allowed	
23.	Spam	Allowed	
24.	Legitimate	Allowed	

5. An analyst for Textbooks America believes that undergraduates are no more likely to buy used textbooks than are graduate students. Their marketing department selected a random sample of 200 undergraduate students and 100 graduate students. Each was asked whether they had purchased a used textbook during the current semester. Sixty-one undergraduate students and twenty-one graduate students had purchased a used book during the current semester.

A) Complete the following crosstabulation (contingency table.)

	Undergraduate	Graduate	Total
had bought used			
had not bought used			
Total students interviewed			

- B) Overall, what *proportion* of students purchased a used book during the current semester?
- C) Was the analyst's belief supported by this sample evidence? Cite appropriate numerical proof to support your answer.