Basic Statistics in BUSINESS & ECONOMICS

2024 RELEASE

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DEDICATION

To Jane, my wife and best friend, and our sons, their wives, and our grandchildren: Mike and Sue (Steve and Courtney), Steve and Kathryn (Kennedy, Jake, and Brady), and Mark and Sarah (Jared and Erika, Drew, and Nate).

Douglas A. Lind

To Andrea.

William G. Marchal

To my wonderful family: Barb, Hannah, and Isaac.

Samuel A. Wathen

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A NOTE FROM THE AUTHORS

Over the years, we received many compliments on this text and understand that it's a favorite among students. We accept that as the highest compliment and continue to work very hard to maintain that status.

The objective of *Basic Statistics in Business and Economics* is to provide students majoring in management, marketing, finance, accounting, economics, and other fields of business administration with an introductory survey of descriptive and inferential statistics. We use many examples and exercises to illustrate the application of statistics to current business-related questions and problems. To use our text, a previous course in statistics is not necessary, and the mathematical requirement is first-year algebra.

In this text, we show beginning students every step needed to be successful in a basic statistics course. This step-by-step approach enhances performance, accelerates preparedness, and significantly improves motivation. Understanding the concepts, seeing and doing plenty of examples and exercises, and comprehending the application of statistical methods in business and economics are the focus of this book.

The first edition of this text was published in 1967. At that time, locating and accessing relevant business data was difficult. That has changed! Today retail stores collect data from our online searches and purchases and then use the data to selectively target market products and services to each of us. Financial institutions collect data related to our transactions to determine credit scores and target market various financial products. Medical devices automatically monitor our heart rate, blood pressure, and temperature from remote locations. A large amount of business information is recorded and reported almost instantly. CNN, *USA Today,* and MSNBC, for example, all have websites that track stock prices in real time.

Today, the practice of data analytics is widely applied to "big data." The practice of data analytics requires skills and knowledge in several areas. Computer skills are needed to process large volumes of information. Analytical skills are needed to evaluate, summarize, organize, and analyze the information. Critical thinking skills are needed to interpret and communicate the results of processing the information.

Our text supports the development of basic data analytical skills. At the end of each chapter is the section Data Analytics. As you work through the text, this section provides the instructor and student with opportunities to apply statistical knowledge and statistical software to explore several business environments. Interpretation of the analytical results is an integral part of these exercises. In addition, many of the text's exercises ask students to apply statistical techniques using small data sets. Over 350 data sets can be easily accessed in Connect with statistical software.

A variety of statistical software is available to complement our text. Microsoft Excel includes an add-in with many statistical analyses. MegaStat is an add-in available for Microsoft Excel. Minitab and JMP are stand-alone statistical software packages available to download for either PC or MAC computers. In our text, Microsoft Excel, Minitab, and MegaStat are used to illustrate statistical software analyses. The text now includes references or links to Excel tutorials in Connect. These provide users with clear demonstrations using statistical software to create graphical and descriptive statistics and statistical analyses to test hypotheses. We use screen captures within the chapters, so the student becomes familiar with the nature of the software output.

Because of the availability of computers and software, it is no longer necessary to dwell on calculations. We have replaced many of the calculation examples with interpretative ones, to assist the student in understanding and interpreting the statistical results. In addition, we place more emphasis on the conceptual nature of the statistical topics. While making these changes, we still continue to present, as best we can, the key concepts, along with supporting interesting and relevant examples.

WHAT'S NEW IN THE 2024 RELEASE?

The 2024 Release benefits from reviewers' thoughtful comments and suggestions. The detailed changes are in the following section on Enhancements to the 2024 Release. In general, we made several changes to the flow and organization of the text. For example, the sampling distribution of the proportion is added to Chapter 8 (Sampling, Sampling Methods, and the Central Limit Theorem), and the one- and two-sample tests of hypothesis for proportions are now included in Chapters 10 (One-Sample Tests of Hypothesis) and 11 (Two-Sample Tests of Hypothesis). The *F*-distribution now precedes the two-sample tests of hypothesis in Chapter 11. Several chapter introductions are revised to help explain the significance of the chapter's content.

This edition also brings a renewed recognition of diversity, equity, and inclusion to the text, exercises, and examples. As you read the text, you will find an increased diversity of persons and businesses from varied geographic, ethnic, and cultural groups. We hope these changes help promote awareness, consideration, and implementation of diversity, equity, and inclusion in our societies.

ENHANCEMENTS TO *BASIC STATISTICS IN BUSINESS AND ECONOMICS*, 2024 RELEASE

Based on reviewer comments, we made many important changes to the text.

CHAPTER 1 What Is Statistics?

- Updated examples, illustrations, and exercises.
- Revised exercises: 11, 13, 17, and 19.

CHAPTER 2 Describing Data: Frequency Tables, Frequency Distributions, and Graphic Presentation

- Improved comparisons and illustrations of raw versus grouped data.
- The mode is introduced to help describe frequency distributions.
- Revised exercises: 14, 30, 42, 44, 47, and 48.
- Updated Self-Review 2-3.

CHAPTER 3 Describing Data: Numerical Measures

- Expanded presentations of Chebyshev's theorem and the Empirical Rule.
- The section "Compute the mean and standard deviation of grouped data" is removed from the text.
- Revised exercises: 18, 21, 52, 56, 61, and 62.

CHAPTER 4 Describing Data: Displaying and Exploring Data

- A revised introduction relates the chapter topics to data visualization.
- A "Statistics in Action" section about Florence Nightingale and historical reference to data visualization is reintroduced to the text.
- Additional details of computing boxplot whiskers when there are outliers versus no outliers.
- Additional discussion and integration of the interquartile range.
- Revised exercises: 3, 4, 5, 6, 7, 8, 12, 13, 14, 15, 16, 24, 28, 30, and 31.

CHAPTER 5 A Survey of Probability Concepts

- New chapter opening features a lottery example to introduce probability.
- A revised introduction transitions the reader from descriptive statistics using frequency distributions to the concept of probability.
- The sections on counting, permutations, and combinations now follow the classical probability section.
- Each approach to probability (classical, empirical, and subjective) has its own learning objective.
- Revised exercises: 3, 7, 9, 10, 52, and 54.

CHAPTER 6 Discrete Probability Distributions

- A revised introduction discusses the application of probability distributions to decision support models and data science.
- Revised exercises: 53 and 54.

CHAPTER 7 Continuous Probability Distributions

- Revised and expanded uniform distribution section provides more context for its application.

- Standardization of the examples showing how to apply the standard normal probability distribution.
- Moved the empirical distribution section to follow the application of the standard normal table.

CHAPTER 8 Sampling, Sampling Methods, and the Central Limit Theorem

- New section describing and applying the sampling distribution of the sample proportion with associated exercises.
- Revised exercises: 4, 13, 24, and 35.

CHAPTER 9 Estimation and Confidence Intervals

- Revised introduction describing the transition from sampling distributions to the application of sampling distributions to estimate population parameters.
- New exercises: 11 and 12.
- Revised exercises: 4, 24, and 31.

CHAPTER 10 One-Sample Tests of Hypothesis

- Revised introduction describes the transition from interval estimation to hypothesis testing.
- Hypothesis testing of a population proportion is now included in this chapter.
- Revised and expanded description and application of Type I and Type II errors.
- New examples contrasting the interpretation of hypothesis tests resulting in "failing to reject the null hypothesis," versus "rejecting the null hypothesis."
- Revised exercises: 1, 2, 3, 4, 5, 6, 7, and 8.

CHAPTER 11 Two-Sample Tests of Hypothesis

- A section on the *F*-distribution and testing the equality of two variances is now in this chapter.
- Many chapter exercises include equality of population variance hypothesis tests in advance of testing the equality of two population means.
- Two-sample tests of proportions is now in this chapter.
- Revised exercises: 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and 60.

CHAPTER 12 Analysis of Variance

- The section on the *F*-distribution is moved to Chapter 11.

CHAPTER 13 Correlation and Linear Regression

- New "Statistics in Action" feature.
- Revised exercises: 17, 36, 41, and 43.

CHAPTER 14 Multiple Regression Analysis

- Revised introduction relating the importance and application of multiple regression and modeling to the broader context of data science.
- Revised exercises: 5, 6, 7, 8, 9, 10, 12, 16, 17, 20, 21, 22, 24, and 26.

CHAPTER 15 Nonparametric Methods: Nominal Level Hypothesis Tests

- Moved the single population proportion hypothesis test to Chapter 10.
- Moved two-sample population proportion hypothesis test to Chapter 11.
- Revised exercises: 18, 19, 25, 27, 29, 30, and 35.

APPENDIX A: Updated 2022 Major League Baseball data.

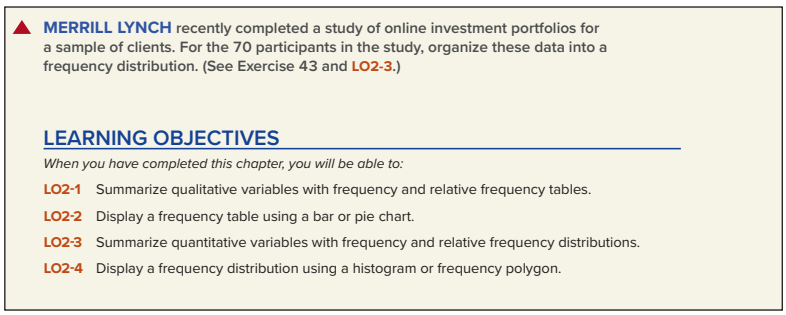
APPENDIX B: The *F*-distribution table values are presented to two significant digits. All Chapter 12 exercises can be solved with the tables.

APPENDIX C AND D: All solutions updated based on revised or updated exercises and/or data.

HOW ARE CHAPTERS ORGANIZED TO ENGAGE STUDENTS AND PROMOTE LEARNING?

Chapter Learning Objectives

Each chapter begins with a set of learning objectives designed to provide focus for the chapter and motivate student learning. These objectives, located in the margins next to the topic, indicate what the student should be able to do after completing each section in the chapter.



MERRILL LYNCH recently completed a study of online investment portfolios for a sample of clients. For the 70 participants in the study, organize these data into a frequency distribution. (See Exercise 43 and LO2-3.)

LEARNING OBJECTIVES

When you have completed this chapter, you will be able to:

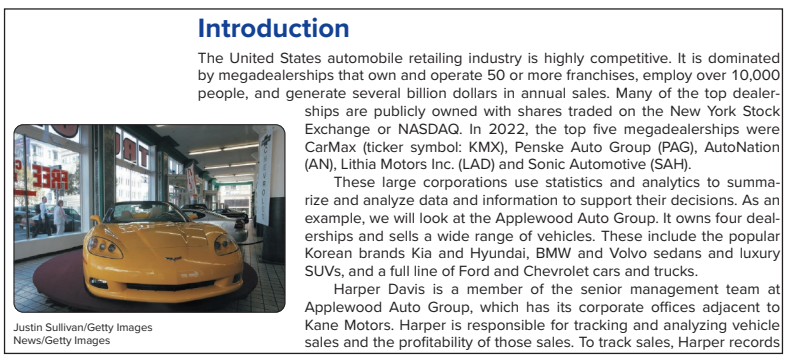
- **LO2-1** Summarize qualitative variables with frequency and relative frequency tables.
- **LO2-2** Display a frequency table using a bar or pie chart.
- **LO2-3** Summarize quantitative variables with frequency and relative frequency distributions.
- **LO2-4** Display a frequency distribution using a histogram or frequency polygon.

Chapter Opening Exercise

A representative exercise opens the chapter and shows how the chapter content can be applied to a real-world situation.

Introduction to the Topic

Each chapter starts with a review of the important concepts of the previous chapter and provides a link to the material in the current chapter. This step-by-step approach increases comprehension by providing continuity across the concepts.



Introduction

The United States automobile retailing industry is highly competitive. It is dominated by megadealerships that own and operate 50 or more franchises, employ over 10,000 people, and generate several billion dollars in annual sales. Many of the top dealerships are publicly owned with shares traded on the New York Stock Exchange or NASDAQ. In 2022, the top five megadealerships were CarMax (ticker symbol: KMX), Penske Auto Group (PAG), AutoNation (AN), Lithia Motors Inc. (LAD) and Sonic Automotive (SAH).

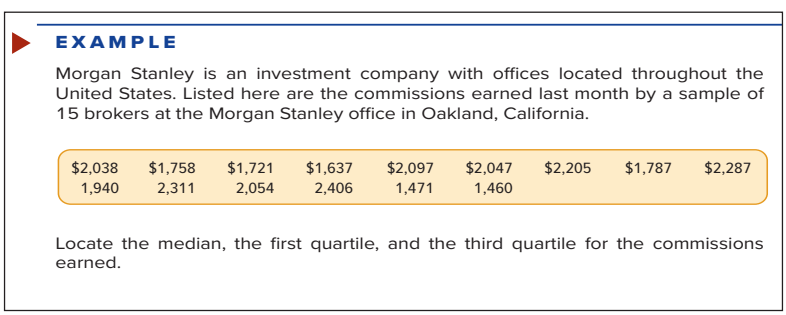
These large corporations use statistics and analytics to summarize and analyze data and information to support their decisions. As an example, we will look at the Applewood Auto Group. It owns four dealerships and sells a wide range of vehicles. These include the popular Korean brands Kia and Hyundai, BMW and Volvo sedans and luxury SUVs, and a full line of Ford and Chevrolet cars and trucks.

Harper Davis is a member of the senior management team at Applewood Auto Group, which has its corporate offices adjacent to Kane Motors. Harper is responsible for tracking and analyzing vehicle sales and the profitability of those sales. To track sales, Harper records

Justin Sullivan/Getty Images
News/Getty Images

Example/Solution

After important concepts are introduced, a solved example is given. This example provides a how-to illustration and shows a relevant business application that helps students answer the question, "How can I apply this concept?"



EXAMPLE

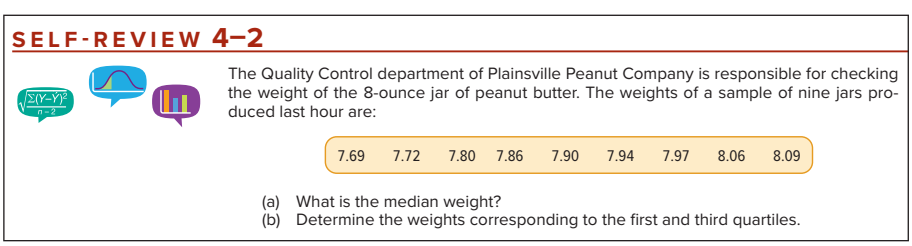
Morgan Stanley is an investment company with offices located throughout the United States. Listed here are the commissions earned last month by a sample of 15 brokers at the Morgan Stanley office in Oakland, California.

$2,038	$1,758	$1,721	$1,637	$2,097	$2,047	$2,205	$1,787	$2,287
1,940	2,311	2,054	2,406	1,471	1,460			

Locate the median, the first quartile, and the third quartile for the commissions earned.

Self-Reviews

Self-Reviews are interspersed throughout each chapter and follow Example/Solution sections. They help students monitor their progress and provide immediate reinforcement for that particular technique. Answers are in Appendix D.



SELF-REVIEW 4–2

The Quality Control department of Plainsville Peanut Company is responsible for checking the weight of the 8-ounce jar of peanut butter. The weights of a sample of nine jars produced last hour are:

7.69	7.72	7.80	7.86	7.90	7.94	7.97	8.06	8.09

(a) What is the median weight?
(b) Determine the weights corresponding to the first and third quartiles.

Statistics in Action

Statistics in Action articles are scattered throughout the text, usually about two per chapter. They provide unique, interesting applications and historical insights in the field of statistics.

STATISTICS IN ACTION

If you wish to get some attention at the next gathering you attend, announce that you believe that at least two people present were born on the same date—that is, the same day of the year but not necessarily the same year. If there are 30 people in the room, the probability of a duplicate is .706. If there

Definitions

Definitions of new terms or terms unique to the study of statistics are set apart from the text and highlighted for easy reference and review. They also appear in the Glossary at the end of the book.

JOINT PROBABILITY A probability that measures the likelihood two or more events will happen concurrently.

Formulas

Formulas that are used for the first time are boxed and numbered for reference. In addition, a list of all formulas is included in the back of the text.

SPECIAL RULE OF MULTIPLICATION $P(A \text{ and } B) = P(A)P(B)$ **(5–8)**

Exercises

Exercises are included after sections within the chapter and at the end of the chapter. Section exercises cover the material studied in the section. Many exercises have data files available to import into statistical software. They are indicated with the FILE icon. Answers to the odd-numbered exercises are in Appendix C.

EXERCISES

The answers to the odd-numbered exercises are in Appendix C.

1. Compute the mean of the following population values: 6, 3, 5, 7, 6.
2. Compute the mean of the following population values: 14, 10, 14, 6, 14, 8.
3. **a.** Compute the mean of the following sample values: 5, 9, 4, 10.
   b. Show that $\Sigma(x - \bar{x}) = 0$.
4. **a.** Compute the mean of the following sample values: 1.3, 7.0, 3.6, 4.1, 5.0.
   b. Show that $\Sigma(x - \bar{x}) = 0$.
5. Compute the mean of the following sample values: 16.25, 12.91, 14.58.
6. Suppose you go to the grocery store and spend $61.85 for the purchase of 14 items. What is the mean price per item?

Computer Output

The text includes many software examples, using Excel, MegaStat®, and Minitab. The software results are illustrated in the chapters. Instructions for the software examples are referenced in online tutorials in Connect.

	A	B	C	D	E	F	G	H
1	Age	Profit	Location	Vehicle-Type	Previous		*Profit*	
2	21	$1,387	Tionesta	Sedan	0			
3	23	$1,754	Sheffield	SUV	1		Mean	1843.17
4	24	$1,817	Sheffield	Hybrid	1		Standard Erro	47.97
5	25	$1,040	Sheffield	Compact	0		Median	1882.50
6	26	$1,273	Kane	Sedan	1		Mode	1761.00
7	27	$1,529	Sheffield	Sedan	1		Standard Dev	643.63
8	27	$3,082	Kane	Truck	0		Sample Variar	414256.60
9	28	$1,951	Kane	SUV	1		Kurtosis	-0.22
10	28	$2,692	Tionesta	Compact	0		Skewness	-0.24
11	29	$1,206	Sheffield	Sedan	0		Range	2998.00
12	29	$1,342	Kane	Sedan	2		Minimum	294.00
13	30	$443	Kane	Sedan	3		Maximum	3292.00
14	30	$754	Olean	Sedan	2		Sum	331770.00
15	30	$1,621	Sheffield	Truck	1		Count	180.00

Microsoft Excel

BY CHAPTER

Chapter Summary

Each chapter contains a brief summary of the chapter material, including vocabulary, definitions, and critical formulas.

Pronunciation Key

This section lists the mathematical symbol, its meaning, and how to pronounce it. We believe this will help the student retain the meaning of the symbol and generally enhance course communications.

Chapter Exercises

Generally, the end-of-chapter exercises are the most challenging and integrate the chapter concepts. The answers and worked-out solutions for all odd-numbered exercises are in Appendix C. Many exercises are noted with a data file icon in the margin. For these exercises, there are data files in Excel format located on the text's website through Connect. These files help students use statistical software to solve the exercises.

Data Analytics

The goal of the Data Analytics sections is to develop analytical skills. The exercises present a real-world context with supporting data. The data sets are printed in Appendix A and available to download from the text's website through Connect. Statistical software is required to analyze the data and respond to the exercises. Each data set is used to explore questions and discover findings that relate to a real-world context. For each business context, a story is uncovered as students progress from Chapters 1 to 15.

CHAPTER SUMMARY

I. A random variable is a numerical value determined by the outcome of an experiment.
II. A probability distribution is a listing of all possible outcomes of an experiment and the probability associated with each outcome.
  A. A discrete probability distribution can assume only certain values. The main features as follows:
    1. The sum of the probabilities is 1.00.
    2. The probability of a particular outcome is between 0.00 and 1.00.
    3. The outcomes are mutually exclusive.
  B. A continuous distribution can assume an infinite number of values within a specific range.
III. The mean and variance of a discrete probability distribution are computed as follows:
  A. The mean is computed as:

$$\mu = \Sigma[xP(x)] \qquad \textbf{(6–1)}$$

  B. The variance is computed as:

PRONUNCIATION KEY

SYMBOL	MEANING	PRONUNCIATION
$P(A)$	Probability of A	P of A
$P(\sim A)$	Probability of not A	P of not A
$P(A \text{ and } B)$	Probability of A and B	P of A and B
$P(A \text{ or } B)$	Probability of A or B	P of A or B
$P(A \mid B)$	Probability of A given B has happened	P of A given B
${}_nP_r$	Permutation of n items selected r at a time	Pnr
${}_nC_r$	Combination of n items selected r at a time	Cnr

CHAPTER EXERCISES

27. According to the local union president, the mean gross income of plumbers in the Salt Lake City area follows the normal probability distribution with a mean of $45,000 and a population standard deviation of $3,000. A recent investigative reporter for KYAK TV found, for a sample of 120 plumbers, the mean gross income was $45,500. At the .10 significance level, is it reasonable to conclude that the mean income is not equal to $45,000? Determine the p-value.

28. FILE Rutter Nursery Company packages its pine bark mulch in 50-pound bags. From a long history, management knows that the distribution of bag weights is normally distributed with a population standard deviation of 3 pounds per bag. At the end of each day, Jeff Rutter, the production manager, weighs 10 bags and computes the mean weight of the sample. Following are the weights of 10 bags from today's production.

45.6	47.7	47.6	46.3	46.2	47.4	49.2	55.8	47.5	48.5

  a. Can Mr. Rutter conclude that the mean weight of the bags is less than 50 pounds? Use the .01 significance level.
  b. In a brief report, tell why Mr. Rutter can use the z-distribution as the test statistic.
  c. Compute the p-value.

29. A new weight-watching company, Weight Reducers International, advertises that those who join will lose an average of 10 pounds after the first 2 weeks. The population standard deviation is 2.8 pounds. A random sample of 50 people who joined the weight reduction program revealed a mean loss of 9 pounds. At the .05 level of significance, can we conclude that those joining Weight Reducers will lose less than 10 pounds?

DATA ANALYTICS

52. Refer to the North Valley Real Estate data, which report information on homes sold during the last year.
  a. The mean selling price (in $ thousands) of the homes was computed earlier to be $357.0, with a standard deviation of $160.7. Use the normal distribution to estimate the percentage of homes selling for more than $500.000. Compare this to the actual results. Is price normally distributed? Try another test. If price is normally distributed, how many homes should have a price greater than the mean? Compare this to the actual number of homes. Construct a frequency distribution of price. What do you observe?
  b. The mean days on the market is 30 with a standard deviation of 10 days. Use the normal distribution to estimate the number of homes on the market more than

Software Tutorials

References to tutorials demonstrating how to use Excel to compute various statistics and perform statistical analyses are included throughout the text. See an example of the icon to the right.

Answers to Self-Review

The worked-out solutions to the Self-Reviews are provided in Appendix D.

Classes	Frequency	Relative Frequency
13 up to 19	5	7.58%
19 up to 25	10	15.15
25 up to 31	16	24.24
31 up to 37	19	28.79
37 up to 43	11	16.67
43 up to 49	4	6.06
49 up to 55	1	1.52
Grand Total	66	100.00

Practice Test

The Practice Test is intended to give students an idea of content that might appear on a test and how the test might be structured. The Practice Test includes both objective questions and problems covering the material studied in the chapter.

PRACTICE TEST

Part 1—Objective

1. A graph for displaying data in which each individual value is represented along a number line is called a _____.
2. A _____ is a graphical display based on five statistics: the maximum and minimum values, the first and third quartiles, and the median.
3. A _____ is a graphical technique used to show the relationship between two interval- or ratio-scaled variables.

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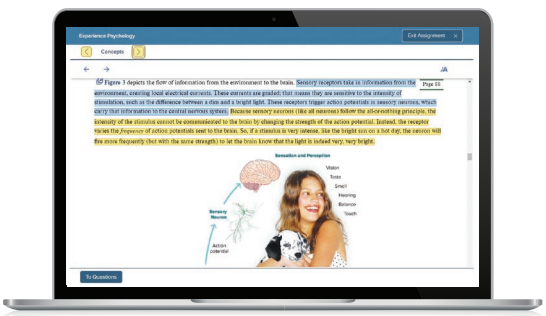

Laptop: Getty Images; Woman/dog: George Doyle/Getty Images

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Jordan Cunningham, a student at *Eastern Washington University*

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The *Connect*® Instructor Library is your repository for additional resources to improve student engagement in and out of class. You can select and use any asset that enhances your lecture, including:

- **Solutions Manual** The Solutions Manual, carefully revised by the authors, contains solutions to all basic, intermediate, and difficult exercises found throughout the chapters.
- **Test Bank** The Test Bank, revised by Wendy Bailey of Troy University, contains hundreds of true/false, multiple choice, and short-answer/discussions, updated based on the revisions of the authors. The level of difficulty varies, as indicated by the easy, medium, and difficult labels.
- **PowerPoint Presentations** Prepared by Stephanie Campbell of Mineral Area College, the presentations contain exhibits, tables, key points, and summaries in a visually stimulating collection of slides.
- **Excel Templates** There are templates for various end-of-chapter problems that have been set as Excel spreadsheets—all denoted by an icon. Students can easily download, save the files, and use the data to solve end-of-chapter problems.

MEGASTAT® FOR MICROSOFT EXCEL®

MegaStat® by J. B. Orris of Butler University is a full-featured Excel statistical analysis add-in that is available on the MegaStat website at **www.mhhe.com/megastat** (for purchase). MegaStat works with recent versions of Microsoft Excel® (Windows and Mac OS X). See the website for details on supported versions.

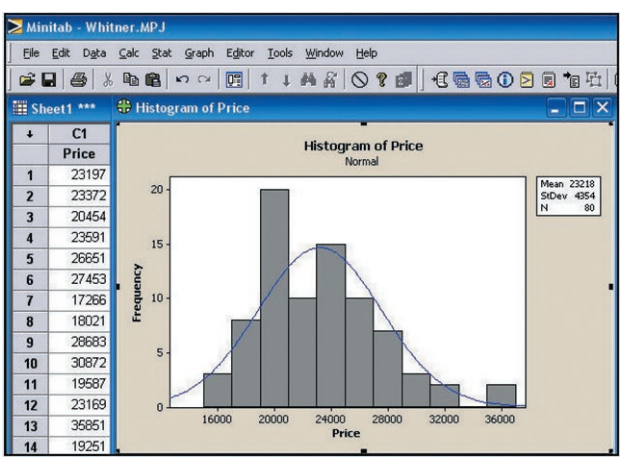
Once installed, MegaStat will always be available on the Excel add-ins ribbon with no expiration date or data limitations. MegaStat performs statistical analyses within an Excel workbook. When a MegaStat menu item is selected, a dialog box pops up for data selection and options. Since MegaStat is an easy-to-use extension of Excel, students can focus on learning statistics without being distracted by the software. Ease-of-use features include Auto Expand for quick data selection and Auto Label detect.

MegaStat does most calculations found in introductory statistics textbooks, such as computing descriptive statistics, creating frequency distributions, and computing probabilities as well as hypothesis testing, ANOVA, chi-square analysis, and regression analysis (simple and multiple). MegaStat output is carefully formatted and appended to an output worksheet.

Video tutorials are included that provide a walkthrough using MegaStat for typical business statistics topics.
A context-sensitive help system is built into MegaStat and a User's Guide is included in PDF format.

MINITAB®/SPSS®/JMP®

Minitab®, Minitab© Express, SPSS®, and JMP® Student Edition are software products that are available to help students solve the exercises with data files. Each software product can be packaged with any McGraw Hill business statistics text.



Minitab, Inc.

PROCTORIO
REMOTE PROCTORING & BROWSER-LOCKING CAPABILITIES

Remote proctoring and browser-locking capabilities, hosted by Proctorio within Connect, provide control of the assessment environment by enabling security options and verifying the identity of the student.

Seamlessly integrated within Connect, these services allow instructors to control the assessment experience by verifying identification, restricting browser activity, and monitoring student actions.

Instant and detailed reporting gives instructors an at-a-glance view of potential academic integrity concerns, thereby avoiding personal bias and supporting evidence-based claims.

READANYWHERE® APP

Read or study when it's convenient with McGraw Hill's free ReadAnywhere® app. Available for iOS and Android smartphones or tablets, give users access to McGraw Hill tools including the eBook and SmartBook® or Adaptive Learning Assignments in McGraw Hill Connect®. Students can take notes, highlight, and complete assignments offline—all their work will sync when connected to Wi-Fi. Students log in with their Connect username and password to start learning—anytime, anywhere!

OLC-ALIGNED COURSES
IMPLEMENTING HIGH-QUALITY INSTRUCTION AND ASSESSMENT THROUGH PRECONFIGURED COURSEWARE

In consultation with the Online Learning Consortium (OLC) and our certified Faculty Consultants, McGraw Hill has created preconfigured courseware using OLC's quality scorecard to align with best practices in online course delivery. This turnkey courseware contains a combination of formative assessments, summative assessments, homework, and application activities, and can easily be customized to meet an individual instructor's needs and desired course outcomes. For more information, visit **www.mheducation.com/highered/olc**.

TEST BUILDER IN CONNECT

Available within McGraw Hill Connect®, Test Builder is a cloud-based tool that enables instructors to format tests that can be printed, administered within a Learning Management System, or exported as a Word document. Test Builder offers a modern, streamlined interface for easy content configuration that matches course needs, without requiring a download.

Test Builder allows you to:

- access all test bank content from a particular title.
- easily pinpoint the most relevant content through robust filtering options.
- manipulate the order of questions or scramble questions and/or answers.
- pin questions to a specific location within a test.
- determine your preferred treatment of algorithmic questions.
- choose the layout and spacing.
- add instructions and configure default settings.

Test Builder provides a secure interface for better protection of content and allows for just-in-time updates to flow directly into assessments.

WRITING ASSIGNMENT

Available within McGraw Hill Connect®, the Writing Assignment tool delivers a learning experience to help students improve written communication skills and conceptual understanding. Assign, monitor, grade, and provide feedback on writing more efficiently and effectively.

APPLICATION-BASED ACTIVITIES IN MCGRAW HILL CONNECT®

Prepare students for the real world with Application-Based Activities in Connect. These highly interactive, assignable exercises boost engagement and provide a safe space to apply concepts learned to real-world, course-specific problems. Each Application-Based Activity involves the application of multiple concepts, providing the ability to synthesize information and use critical thinking skills to solve realistic scenarios.

POLLING

Every learner has unique needs. Uncover where and when you're needed with the new Polling tool in McGraw Hill Connect®! Polling allows you to discover where students are in real time. Engage students and help them create connections with your course content while gaining valuable insight during lectures. Leverage polling data to deliver personalized instruction when and where it is needed most.

EVERGREEN

Content and technology are ever-changing, and it is important that you can keep your course up to date with the latest information and assessments. That's why we want to deliver the most current and relevant content for your course, hassle-free.

Lind: *Basic Statistics in Business and Economics* is moving to an Evergreen delivery model, which means it has content, tools, and technology that is updated and relevant, with updates delivered directly to your existing McGraw Hill Connect® course. Engage students and freshen up assignments with up-to-date coverage of select topics and assessments, all without having to switch editions or build a new course.

CREATE
YOUR BOOK, YOUR WAY

McGraw Hill's Content Collections Powered by Create® is a self-service website that enables instructors to create custom course materials—print and eBooks—by drawing upon McGraw Hill's comprehensive, cross-disciplinary content. Choose what you want from our high-quality textbooks, digital products, articles, cases, and more. Combine it with your own content quickly and easily, and tap into other rights-secured, third-party content such as cases, articles, readings, cartoons, and labs. Content can be arranged in a way that makes the most sense for your course, and you can select your own cover and include the course name and school information as well. Choose the best format for your course: color print, black-and-white print, or eBook. The eBook can be included in your Connect course and is available on the free ReadAnywhere® app for smartphone or tablet access as well. When you are finished customizing, you will receive a free digital copy to review in just minutes! Visit McGraw Hill Create®—**www.mcgrawhillcreate.com**—today and begin building!

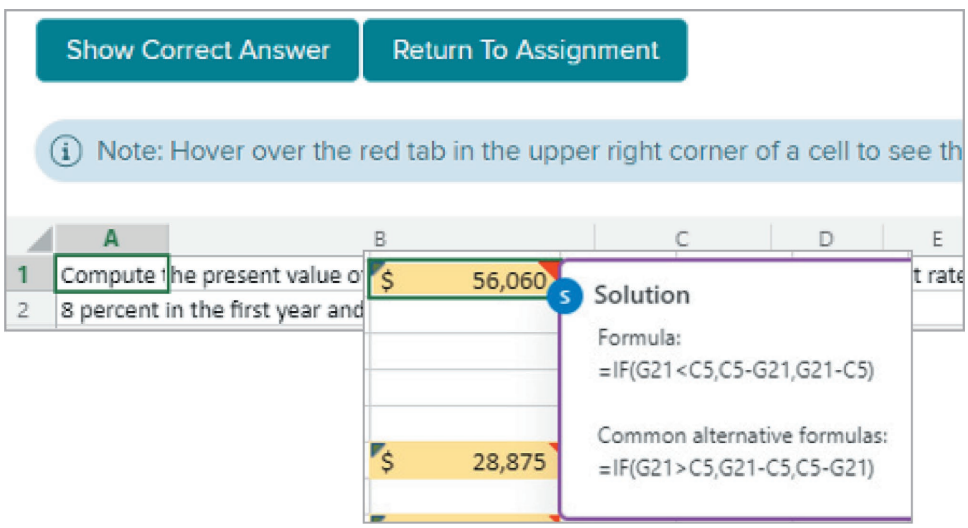
REFLECTING THE DIVERSE WORLD AROUND US

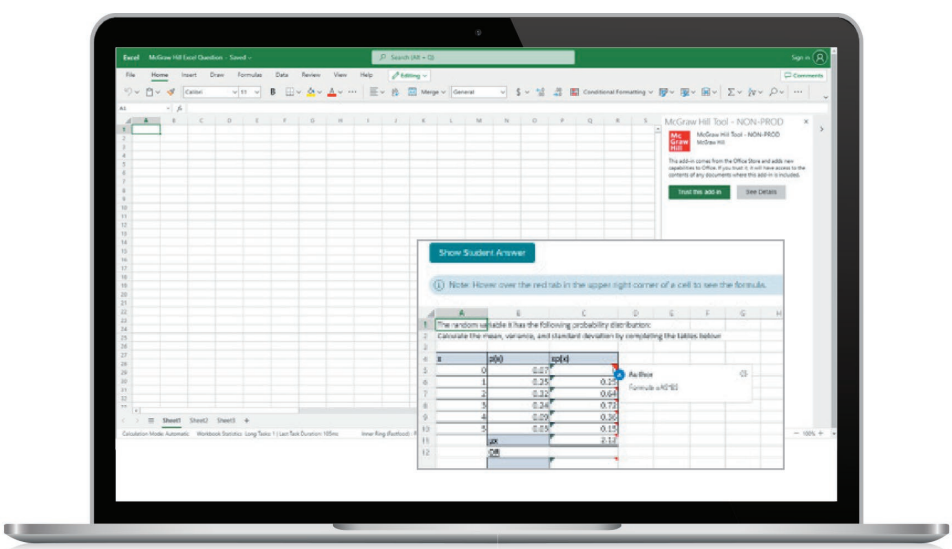
McGraw Hill believes in unlocking the potential of every learner at every stage of life. To accomplish that, we are dedicated to creating products that reflect, and are accessible to, all the diverse, global customers we serve. Within McGraw Hill, we foster a culture of belonging, and we work with partners who share our commitment to equity, inclusion, and diversity in all forms. In McGraw Hill Higher Education, this includes, but is not limited to, the following:

- Refreshing and implementing inclusive content guidelines around topics including generalizations and stereotypes, gender, abilities/disabilities, race/ethnicity, sexual orientation, diversity of names, and age.
- Enhancing best practices in assessment creation to eliminate cultural, cognitive, and affective bias.
- Maintaining and continually updating a robust photo library of diverse images that reflect our student populations.
- Including more diverse voices in the development and review of our content.
- Strengthening art guidelines to improve accessibility by ensuring meaningful text and images are distinguishable and perceivable by users with limited color vision and moderately low vision.

INTEGRATED EXCEL NEW!

Integrated Excel assignments pair the power of Microsoft Excel with the power of Connect. A seamless integration of Excel within Connect, Integrated Excel questions allow students to work in live, auto-graded Excel spreadsheets—no additional logins, no need to upload or download files. Instructors can choose to grade by formula or solution value, and students receive instant cell-level feedback via integrated Check My Work functionality.





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BRIEF CONTENTS

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