***Business Analytics,* 3e (Evans)**
Chapter 1: Introduction to Business Analytics

1) Descriptive analytics:
A) can predict risk and find relationships in data not readily apparent with traditional analyses.
B) helps companies classify their customers into segments to develop specific marketing campaigns.
C) helps detect hidden patterns in large quantities of data to group data into sets to predict behavior.
D) can use mathematical techniques with optimization to make decisions that take into account the uncertainty in the data.
Answer: B
Diff: 1
Blooms: Remember
Topic: Descriptive, Predictive, and Prescriptive Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive analytics.

2) A manager at Gampco Inc. wishes to know the company's revenue and profit in its previous quarter. Which of the following business analytics will help the manager?
A) prescriptive analytics
B) normative analytics
C) descriptive analytics
D) predictive analytics
Answer: C
Diff: 1
Blooms: Apply
AACSB: Analytic Skills
Topic: Descriptive, Predictive, and Prescriptive Analytics
LO1: Explain the difference between descriptive, predictive, and prescriptive analytics.

3) Predictive analytics:
A) summarizes data into meaningful charts and reports that can be standardized or customized.
B) identifies the best alternatives to minimize or maximize an objective.
C) uses data to determine a course of action to be executed in a given situation.
D) detects patterns in historical data and extrapolates them forward in time.
Answer: D
Diff: 2
Blooms: Remember
Topic: Descriptive, Predictive, and Prescriptive Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive analytics.

4) A trader who wants to predict short-term movements in stock prices is likely to use _____ analytics.
A) predictive
B) descriptive
C) normative
D) prescriptive
Answer: A
Diff: 1
Blooms: Apply
AACSB: Analytic Skills
Topic: Descriptive, Predictive, and Prescriptive Analytics
LO1: Explain the difference between descriptive, predictive, and prescriptive analytics.

5) Which of the following questions will prescriptive analytics help a company address?
A) How many and what types of complaints did they resolve?
B) What is the best way of shipping goods from their factories to minimize costs?
C) What do they expect to pay for fuel over the next several months?
D) What will happen if demand falls by 10% or if supplier prices go up 5%?
Answer: B
Diff: 2
Blooms: Understand
AACSB: Analytic Skills
Topic: Descriptive, Predictive, and Prescriptive Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive analytics.

6) The demand for coffee beans over a period of three months has been represented in the form of an L-shaped curve. Which form of model was used here?
A) mathematical model
B) visual model
C) kinesthetic (tactile) model
D) verbal model
Answer: B
Diff: 1
Blooms: Apply
AACSB: Analytic Skills
Topic: Models in Business Analytics
LO1: Explain the concept of a model and various ways a model can be characterized.

7) Decision variables:
A) cannot be directly controlled by the decision maker.
B) are assumed to be constant.
C) are always uncertain.
D) can be selected at the discretion of the decision maker.

Answer: D
Diff: 2
Blooms: Understand
Topic: Models in Business Analytics
LO1: Define and list the elements of a decision model.

8) Identify the uncontrollable variable from the following inputs of a decision model.
A) investment returns
B) machine capacities
C) staffing levels
D) intercity distances
Answer: A
Diff: 1
Blooms: Apply
Topic: Models in Business Analytics
LO1: Define and list the elements of a decision model.

9) Which of the following inputs of a decision model is an example of data?
A) estimated consumer demand
B) inflation rates
C) costs
D) investment allocations
Answer: C
Diff: 1
Blooms: Remember
Topic: Data for Business Analytics
LO1: Define and list the elements of a decision model.

10) Descriptive decision models:
A) aim to predict what will happen in the future.
B) describe relationships but do not tell a manager what to do.
C) help analyze the risks associated with various decisions.
D) do not facilitate evaluation of different decisions.
Answer: B
Diff: 2
Blooms: Understand
Topic: Models in Business Analytics
LO1: Explain the concept of a model and various ways a model can be characterized.

11) Prescriptive decision models help:
A) make predictions of how demand is influenced by price.
B) make trade-offs between greater rewards and risks of potential losses.
C) decision makers identify the best solution to decision problems.

D) describe relationships and influence of various elements in the model.
Answer: C
Diff: 1
Blooms: Remember
Topic: Models in Business Analytics
LO1: Define the terms optimization, objective function, and optimal solution.

12) The manager at Soul Walk Inc., a shoe manufacturing company, wants to set a new price (P) for a shoe model to maximize total profit. The demand (D) as a function of price is represented as:
D = 1,500 - 2.5P
The total cost (C) as a function of demand is represented as:
C = 3,200 + 3.5D
Which of the following is a model for total profit as a function of price?
A) (1,508.75× price) - (2.5 × price^2) - 8,450
B) (3.5 × price^2) + 3,200 - (1925.50 × price)
C) (1,250 × price) + (5 × price^2) - 8,320
D) [4521 + (4.5 × price)] × price - 9684.25
Answer: A
Diff: 3
Blooms: Apply
Topic: Models in Business Analytics
LO1: Define the terms optimization, objective function, and optimal solution.

13) Which decision model incorporates the process of optimization?
A) predictive
B) prescriptive
C) descriptive
D) normative
Answer: B
Diff: 1
Blooms: Remember
Topic: Models in Business Analytics
LO1: Define the terms optimization, objective function, and optimal solution.

14) Which of the following is the first phase in problem solving?
A) defining the problem
B) analyzing the problem
C) recognizing the problem
D) structuring the problem
Answer: C
Diff: 1
Blooms: Remember

Topic: Problem Solving and Decision Making
LO1: List and explain the steps in the problem-solving process.

15) Middle managers in operations:
A) develop staffing plans.
B) determine product mix.
C) develop advertising plans.
D) make pricing decisions.
Answer: A
Diff: 1
Blooms: Remember
Topic: Problem Solving and Decision Making
LO1: List and explain the steps in the problem-solving process.

16) The product mix is determined by the:
A) accounting staff.
B) middle managers.
C) finance managers.
D) top managers.
Answer: D
Diff: 1
Blooms: Remember
Topic: Problem Solving and Decision Making
LO1: List and explain the steps in the problem-solving process.

17) During which phase in problem solving is a formal model often developed?
A) analyzing the problem
B) structuring the problem
C) defining the problem
D) implementing the solution
Answer: B
Diff: 1
Blooms: Remember
Topic: Problem Solving and Decision Making
LO1: List and explain the steps in the problem-solving process.

18) Which of the following is true about problem solving?
A) Recognizing problems involves stating goals and objectives.
B) Analyzing the problem involves characterizing the possible decisions.
C) Decision making involves translating the results of the model in the organization.
D) Structuring the problem involves identifying constraints.
Answer: D

Diff: 2
Blooms: Understand
Topic: Problem Solving and Decision Making
LO1: List and explain the steps in the problem-solving process.

The manager at Goody Woods Inc., a manufacturer of wooden utensil sets, has observed that when the company sells its sets at $240, 1,540 units are sold, and when the price is raised to $320, demand falls to 1,220 units. Use this information to answer the following two questions.

19) Develop a linear model relating the demand for Goody Woods' units to the price.
Answer: Economic theory tells us that demand for a product is negatively related to its price. The linear model to predict demand as a function of price is:
$D = a - bP$
where D is the quantity demanded, P is the unit price, a is a constant that estimates the demand when the price is zero, and b is the slope of the demand function.

Substituting the values given in the data:
$1,540 = a - (b \times 240)$
$1,220 = a - (b \times 320)$

By solving the two equations, values of a and b can be found.
a = 2,500, which indicates the demand for wood units when price is zero,
b = 4, which is the slope of the demand function.

Substituting values of a and b in the linear demand prediction model:
$D = 2,500 - 4P$
Diff: 3
Blooms: Apply
AACSB: Analytic Skills
Topic: Predictive Spreadsheet Models.
LO1: Build spreadsheet models for descriptive, predictive, and prescriptive applications.

20) Develop a prescriptive model that will help Goody Woods identify the price that maximizes the total revenue.
Answer: Having found out the model for demand as a function of price, sales (S) can be expressed as:
$S = 2,500 - 4P$

Revenue (R) = Sales x Price = $(2,500 - 4P) \times P = 2,500P - 4P^2$

Thus, Goody Woods Inc. can identify the price that maximizes the total revenue using:
$R = 2,500P - 4P^2$
Diff: 3

Blooms: Apply
AACSB: Analytic Skills
Topic: Models in Business Analytics
LO1: Define the terms optimization, objective function, and optimal solution.

21) Decision support systems evolved from efforts to improve military operations prior to and during World War II.
Answer: FALSE
Diff: 1
Blooms: Remember
Topic: Evolution of Business Analytics
LO1: Summarize the evolution of business analytics and explain the concepts of business intelligence, operations research and management science, and decision support systems.

22) A deterministic model is one in which all model input information is either known or assumed to be known with certainty.
Answer: TRUE
Diff: 1
Blooms: Remember
Topic: Models in Business Analytics
LO1: Explain the difference between a deterministic and stochastic decision model.

23) The complexity of a problem increases when the problem belongs to an individual rather than a group.
Answer: FALSE
Diff: 1
Blooms: Remember
Topic: Problem Solving and Decision Making
LO1: List and explain the steps in the problem-solving process.

24) A goal of Korel & Marke, a dot-com company, is to gain strategic advantage over its rival firms. How can Korel & Marke use analytics and exploit social media to accomplish this goal?
Answer: Analytics is helping businesses learn from social media and exploit social media data for strategic advantage. Using analytics, Korel & Marke can integrate social media data with traditional data sources such as customer surveys, focus groups, and sales data. It can also understand trends and customer perceptions of its products; and create informative reports to assist its marketing managers and product designers.
Diff: 2
Blooms: Understand
Topic: What is Business Analytics?
LO1: State some typical examples of business applications in which analytics would be beneficial.

25) What are the three components of decision support systems (DSS)?
Answer: DSSs include three components:
Data management - The data management component includes databases for storing data and allows the user to input, retrieve, update, and manipulate data.
Model management - The model management component consists of various statistical tools and management science models and allows the user to easily build, manipulate, analyze, and
Communication system - The communication system component provides the interface necessary for the user to interact with the data and model management components.
Diff: 2
Blooms: Remember
Topic: Evolution of Business Analytics
LO1: Summarize the evolution of business analytics and explain the concepts of business intelligence, operations research and management science, and decision support systems.

26) Explain how data are used by accountants, economists, and operations managers.
Answer: Following are the ways data are used:
Accountants conduct audits to determine whether figures reported on a firm's balance sheet fairly represent the actual data by examining samples (that is, subsets) of accounting data, such
Economists use data to help companies understand and predict population trends, interest rates, industry performance, consumer spending, and international trade.
Operations managers use data on production performance, manufacturing quality, delivery times, order accuracy, supplier performance, productivity, costs, and environmental compliance to manage their operations.
Diff: 2
Blooms: Remember
Topic: Data for Business Analytics
LO1: State examples of how data are used in business.

27) Data used in business analytics need to be reliable and valid. Explain.
Answer: Sample data do not always reflect reality. People do not always behave the same when observed, nor do they always act as they say they act. Poor data can result in poor decisions. Hence, care must be taken when working with data, and every effort should be made to ensure that data are sufficiently accurate.
Diff: 2
Blooms: Remember
Topic: Data for Business Analytics
LO1: State examples of how data are used in business.

28) Why do predictive decision models incorporate uncertainty?
Answer: The future is always uncertain. Uncertainty is imperfect knowledge of what will happen; risk is associated with the consequences of what actually happens. Even though uncertainty may exist, there may be no risk. However, risk is an outcome of uncertainty, though not always. Thus, many predictive models incorporate uncertainty and help decision makers

analyze the risks associated with their decisions.
Diff: 2
Blooms: Understand
Topic: Models in Business Analytics
LO1: Explain the difference between uncertainty and risk.

29) Which of the following is not a challenge faced by organizations that want to develop analytics capabilities?
A) a lack of understanding of how to use analytics.
B) competing business priorities.
C) understanding benefits versus perceived costs of analytics studies.
D) difficulty in getting good data and sharing information.
Answer: C
Diff: 1
Blooms: Remember
Topic: What is Business Analytics?
LO1: Explain why analytics is important in today's business environment.

30) Prescriptive analytics:
A) summarizes data into meaningful charts and reports that can be standardized or customized.
B) identifies patterns and relationships existing in large data sets.
C) uses data to determine a course of action to be executed in a given situation.
D) detects patterns in historical data and extrapolates them forward in time.
Answer: C
Diff: 2
Blooms: Remember
Topic: Descriptive, Predictive, and Prescriptive Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive analytics.

Use the table below to answer the following question(s).

Fiberia Accessories, a clothing retailer, is planning to introduce a new line of sweaters as part of the winter collection for $65 with an inventory of 1500. The main selling season is 60 days between November and December. The store then sells the remaining units in a clearance sale at 65 percent discount. Out of the 60 main retail days, Fiberia sells the sweaters at full retail price for only 45 days, while giving a discount of 25 percent for the remaining 15 days. The demand functions *a*, and *b* are given as 79.5 and 1.1 respectively.

Marked Down Pricing Model for Fiberia Accessories's new sweater	
Data	
Retail Price	$65
Inventory	1500
Selling Season (days)	60
Days at Full Retail	45
Intermediate Markdown	25 percent
Clearance Markdown	65 percent
Demand Function	
A	79.5
B	1.1

31) What is the average daily sale during the full retail sales period?
A) 15
B) 33.33
C) 8
D) 24.55
Answer: C
Diff: 2
Blooms: Apply
AACSB: Analytic Skills
Topic: Models in Business Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive models.

32) Calculate the total number of units sold during the full retail sales period.
A) 33.33
B) 520
C) 187.5
D) 360
Answer: D
Diff: 2
Blooms: Apply
AACSB: Analytic Skills

Topic: Models in Business Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive models.

33) Calculate the total revenue during the full retail sales period.
A) $23,400
B) $16,200
C) $2,880
D) $17,550
Answer: A
Diff: 2
Blooms: Apply
AACSB: Analytic Skills
Topic: Models in Business Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive models.

34) Calculate the daily sales during the discount sales period.
A) 39.28
B) 133.3
C) 388.13
D) 25.88
Answer: D
Diff: 2
Blooms: Apply
AACSB: Analytic Skills
Topic: Models in Business Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive models.

35) Calculate the total units sold during the discount sales period.
A) 388.13
B) 25.88
C) 133.3
D) 39.28
Answer: A
Diff: 2
Blooms: Apply
AACSB: Analytic Skills
Topic: Models in Business Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive models.

36) Calculate the total revenue during the discount sales period.
A) $4,478.91
B) $18,921.09

C) $10,042.73
D) $43,321.09
Answer: B
Diff: 2
Blooms: Apply
AACSB: Analytic Skills
Topic: Models in Business Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive models.

37) Calculate the revenue for the clearance sales period.
A) $18,921.09
B) $23,400
C) $48,871.88
D) $17,105.16
Answer: D
Diff: 3
Blooms: Apply
AACSB: Analytic Skills
Topic: Models in Business Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive models.

38) Calculate the total revenue for the new line of sweaters.
A) $59,426.25
B) $48,871.88
C) $23,400
D) $43,231.09
Answer: A
Diff: 1
Blooms: Apply
AACSB: Analytic Skills
Topic: Models in Business Analytics
LO1: Illustrate examples of descriptive, predictive, and prescriptive models.