# SOLUTIONS MANUAL

ACCOUNTING
INFORMATION SYSTEMS

The CROSSROADS of ACCOUNTING & IT

SECOND EDITION

Donna Kay · Ali Ovlia

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# Active Review

**2.1** Refer to the chapter opener, *Meet Ingenix*. In your opinion, what could have been done to prevent the faulty database from costing consumers billions of dollars? How would you clean up the Ingenix database?

Students' responses may differ. However, their response should include: data inconsistency and duplication as well as dirty data are the major causes of faulty data. To remove data inconsistency and duplication a database must be normalized. Database cleansing is a technique used to remove dirty data. Refer to the chapter text for normalization and database cleansing.

**2.2** Discuss the differences between an operational database and a data warehouse. Is the accounting database considered an operational database or a data warehouse?

The difference between the operational database and the data warehouse is that the data warehouse is not used for routine business activities. Instead, the data warehouse is often used for business intelligence purposes to improve management decision making. The accounting database is an operational database.

**2.3** What is a DBMS? Discuss its role in the accounting system.

The database management software (DBMS) is a computer program. It is used to insert, update, and delete data in the database. A database engine includes a DBMS.

**2.4** Discuss the importance of primary keys to the accounting database.

A primary key is used to select a specific record among a table of records. It is also used to connect/relate to related database tables. For example, the Customer table is related to the Order table. To implement this relationship, the Customer table primary key field is copied into the Order table.

**2.5** Discuss the role of the accounting database in the accounting system. Which components are behind the screen?

An accounting system consists of three tiers: the accounting database, the DBMS, and front-end accounting software. Accounting data is stored in the accounting database. The DBMS and the accounting database are behind the screen.

**2.6** Discuss the roles of accounting professionals in designing and building accounting databases. Why it is important for accounting professionals to know about enterprise databases?

Accounting professionals can assist IT professionals when designing an accounting application or an accounting database. For example, an accounting professional can help a database designer decide on the number and the types of fields required for a Sales Order table.

**2.7** Discuss how modern database systems support the growth of large enterprises, such as Wal-Mart.

Modern enterprise databases consist of operational and data warehouses. These databases store data in different structures. These structures are supporting many different business needs. Relational databases are used to store daily business operations. Data warehouse structures support complex business decision making processes. Modern databases are shared by the enterprise integrated systems. A centralized and shared database helps faster and more efficient communication within various business functions. It reduces data duplication and inconsistency, which are caused by various databases in a non-integrated system. Integrated centralized databases provide accurate and up-to-date intelligence for efficient decision

making and monitoring overall business performance.

**2.8** What is an intersection table? Why is it created?

To remove a many- to-many relationship between two tables a special type of table called an intersection table is placed at the intersection or junction of the two tables with a many-to-many relationship. The many-to-many relationship between the original tables becomes a one-to-many relationship between each of the original tables and the new intersection table.

**2.9** What is a foreign key? Discuss its importance to a relational database.

In relational databases, tables are related to each other using common fields in two different tables. These common fields are referred to as the primary key and the foreign key. That means, the primary key of a table is copied into a related table. The copied field is called a foreign key.

**2.10** Discuss the advantages of a database accounting system versus a manual accounting system.

The advantages of a database accounting system versus a manual accounting system include:
1.      Large amount of data can be stored and maintained much easier.
2.      Data is stored much more accurately.
3.      Much less space is needed
4.      Information is retrieved much faster--seconds versus days, weeks, or even months.
5.      Data is better secured and controlled.

# Key Terms Check

**2.11** Match the following terms and definitions.

**a.** database fields
**b.** database records
**c.** database tables
**d.** database
**e.** database forms
**f.** database queries
**g.** database reports

_e_ 1. Onscreen interface used for entering and updating data
_g_ 2. Used to view output of the accounting system
_c_ 3. A collection of related records with a unique name
_a_ 4. Pieces of information about events, people, or objects
_f_ 5. Used to search the database and retrieve data from one or more database tables.
_b_ 6. A collection of related fields
_d_ 7. A collection of related tables

**2.12** Match the following terms and definitions.

2

a. operational database
b. data warehouse
c. database administrator
d. intersection table
e. composite primary key
f. normalization
g. database integrity

_c_ 1. Responsible for managing the enterprise's databases
_g_ 2. Ensures that the database contains accurate, valid data.
_b_ 3. Stores data from a variety of sources and is used for business intelligence
_a_ 4. Databases used to store data related to business operations and transactions
_f_ 5. A process for removing database anomalies or problems
_e_ 6. Used when more than one field is required to uniquely identify a record
_d_ 7. Placed at the junction of two tables to eliminate a many-to-many relationship

**2.13** Which of the following statements are true?

_T_ 1. Accounting transactions are stored in the operational database.
_F_ 2. A database administrator is responsible for designing the database.
_T_ 3. The result of a query could be a report.
_T_ 4. Deletion, insertion, and update problems are solved by normalization.
_F_ 5. A data warehouse stores only future data.
_F_ 6. An intersection table refers to the intersection of queries and reports.
_T_ 7. A composite primary key consists of more than one field.

# Practice Test

**2.14** Enter data once means:
a. Data is entered into the database only one time and it is reused from various locations when it is needed (**Correct Answer**)
b. Data is entered only one time and it cannot be entered again
c. Data is used only one time and it can not be reused
d. Data is entered into the database from various locations at the same time.

**2.15** _____ transfers data from the accounting software to the database.
a. CRM.
b. DBMS (**Correct Answer**)
c. User Interface
d. Relational database

**2.16** Internal databases consist of:
a. DBMS
b. Operational database
c. The database stored in the employee computer
d. Operational and data warehouse (**Correct Answer**)

**2.17** While auditing the Account Receivable records, the auditor discovers an entry for Cambiz Coffee shop with an address of 721 Sweet Water Pond, St. Peters MO and another entry for Cambiz Coffee shop with an address of 721 Sweet Water Pond, Saint Peters MO. Each entry has a different customer number. Which of the following statements is false?

a. The DBMS views these as two separate accounts.
b. Data is entered into the computer incorrectly (**Correct Answer**)
c. Customer has two shops
d. The data needs scrubbing

**2.18** _____ is a collection of related records.
a. Database engine
b. Database table (**Correct Answer**)
c. Database field
d. Object Oriented database

**2.19** Which tier in the accounting system architecture consists of accounting software?
a. Accountant tier
b. Database tier
c. User tier
d. Application tier (**Correct Answer**)

**2.20** An item table's record has 5 fields: Item code, Item name, description, location ID, and warehouse ID. Which of these fields is a good candidate for the primary key?
a. Location ID
b. Item Code (**Correct Answer**)
c. Warehouse ID
d. Item name

**2.21** An item may appear on many orders. An order contains many items. The relationship between Item table and Order table is:
a. Many-to-one
b. Many-to-many (**Correct Answer**)
c. One-to-many
d. One-to-one

**2.22** Sandy, an accountant, wants to search for a specific customer address. She should search using:
a. Customer name
b. Customer address
c. Customer ID (**Correct Answer**)
d. a and b

**2.23** Which of the following is NOT a database essential?
a. Form
b. Table
c. Query
d. DBMS (**Correct Answer**)

# Exercises

## Short Exercises

**2.24** Match the following database fields with the appropriate database table. (Q2.3)

**a.** VENDOR table
**b.** CUSTOMER table
**c.** EMPLOYEE table
**d.** ACCOUNTS table
**e.** SALES ORDER table
**f.** SALES ORDER LINE table
**g.** PURCHASE ORDER table
**h.** PURCHASE ORDER LINE table

_b_ 1. Customer name
_d_ 2. Account number
_b_ 3. Customer number
_c_ 4. Employee address
_f_ 5. Item quantity sold
_h_ 6. Item quantity purchased
_e_ 7. Sales order number
_e_ 8. Sales order date
_g_ 9. Purchase order date
_g_ 10. Purchase order number
_a_ 11. Vendor address
_e_ 12. Sales order total
_g_ 13. Purchase order total
_a_ 14. Vendor number
_d_ 15. Account type

**2.25** Identify the relationship between the following tables. (Q2.3)

**a.** one-to-one
**b.** one-to-many
**c.** many-to-many

1. STUDENT table and COURSE table: a
2. TEACHER table and STUDENT table: a
3. EMPLOYEE table and DEPARTMENT table: b

**2.26** Suppose data about vendors and the items they sell are stored in a single database table. Do you think this table is anomaly-free? Why or why not? If you think there are anomalies in this table can you suggest a solution for removing them? (Q2.4)

The table is NOT anomaly-free! The following is a list of anomalies in such a table:
1. Update anomaly: a vendor sells many items. Therefore, there is a record for every item that is sold by that vendor. This causes update anomaly. To update vendor information, many records must be updated. An item maybe sold by many vendors; therefore, item information could appear in many records. To change item information many records must be updated.
2. Deletion anomaly: a vendor may supply a specific item. If that vendor's records are deleted from the table, all information about that specific item is also deleted.
3. Insertion anomaly: both the vendor ID and item code must be used to retrieve item purchase information, such as quantity. Therefore, the table primary key is the combined vendor ID and item code. Let's say we decide to enter information about a vendor who did not sell any items yet. This vendor record cannot be inserted since the other part of the primary key (the item code) is not available yet.

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One possible solution is to divide this table into three tables: a vendor table, an item table, and an item/vendor table. The vendor table stores solely information about vendors. The item table stores only information about items, and the item/vendor table stores information about items sold by vendors.

**2.27** Which of the following database tables would be used in a purchase order form? (Q2.3)
1.             SALES ORDER table
2.             PURCHASE ORDER table
3.             ITEM table
4.             VENDOR table
5.             CUSTOMER table
6.             PURCHASE ORDER LINE table
7.             SALES ORDER LINE table
8.             CASH RECEIPTS table

The VENDOR, PURCHASE ORDER, PURCHASE ORDER LINE, and ITEM tables are used in a purchase order form.

**2.28** An enterprise's EMPLOYEE table contains the following fields. Which of these employee fields is a good choice for the EMPLOYEE table primary key? Why? (Q2.3, 2.4)
- First Name
- Last Name
- ID No
- Address
- Phone Number
- Hours Worked
- Hourly Pay
- Deductions

The only possible choice is the employee ID No. The content of any other field may not be unique.

**2.29** Identify the following as either internal or external databases. (Q2.2)
**a.** Internal database
**b.** External database
 _a_  1. Data warehouse for business intelligence
 _b_  2. EDGAR Online containing annual reports for publicly traded companies
 _a_  3. Accounting database
 _b_  4. Eurostat containing economic and financial statistics about the European Union
 _a_  5. Operational databases for storing business transactions
 _b_  6. Factiva, a database with financial data provided by Dow Jones & Reuters Company

**2.30** Identify in which tier each of the following items belong. (Q2.1)
**a.** Database tier
**b.** Application tier
**c.** User tier
 _a_  1. DBMS
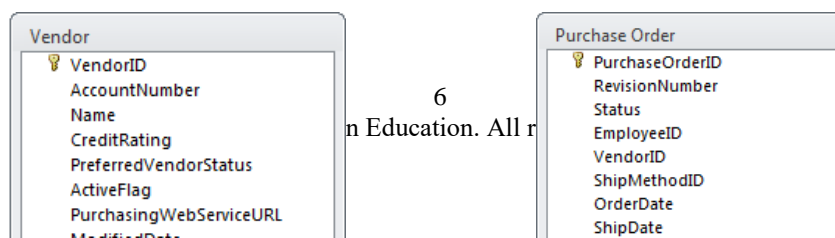 _a_  2. Customer table
 _b_  3. Accounting software
 _c_  4. Customer data entry form
 _c_  5. Vendor report
 _a_  6. Item table

**2.31** Using the following database tables, answer the following questions. (Q2.3)

| Vendor | Purchase Order |
|---|---|
| 🔑 VendorID | 🔑 PurchaseOrderID |
| AccountNumber | RevisionNumber |
| Name | Status |
| CreditRating | EmployeeID |
| PreferredVendorStatus | VendorID |
| ActiveFlag | ShipMethodID |
| PurchasingWebServiceURL | OrderDate |
| | ShipDate |

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1. What is the relationship between the VENDOR table and the PURCHASE ORDER table?  One-to-many. A vendor received many purchase order. A specific purchase order belongs to only one vendor.
2. What is the primary key for the VENDOR table? VendorID
3. What is the primary key for the PURCHASE ORDER table? PurchaseOrderID
4. What is the foreign key for the PURCHASE ORDER table? VendorID

**2.32** Using the following purchase order for EspressoCoffee, answer the following questions. (Q2.3)



1. Name the database tables that EspressoCoffee should use to record its purchase transactions.
   The purchase order transaction is recorded in the PURCHASE ORDER, PURCHASE ORDER LINE, VENDOR, and ITEM tables.
2. Identify the primary key(s) for each table that would uniquely identify each record in the table.
   VENDOR table primary key: Vendor No.
   PURCHASE ORDER table primary key:  PO No.
   ITEM table primary key: Item No.
   PURCHASE ORDER LINE table primary key: PO No. plus Item No.
3. Identify the relationships among the tables as one-to-one, one-to-many, or many-to-many.
   - The relationship between VENDOR and PURCHASE ORDER is one-to-many.
   - The relationship between PURCHASE ORDER and ITEM is many-to-many.
4. Identify the intersection table that should be used to remove any many-to-many relationships.
   The many-to-many relationship is removed by adding the PURCHASE ORDER LINE intersection table.

   The relationship between the PURCHASE ORDER and PURCHASE ORDER LINE is one-to-many.

   The relationship between ITEM and PURCHASE ORDER LINE is one-to-many.
5. Identify foreign keys used to connect the tables.
   The vendor number is the foreign key in the PURCHASE ORDER table.
   The purchase order is the foreign key in the PURCHASE ORDER LINE.
   The Item number is the foreign key in the PURCHASE ORDER LINE table.

## It's Your Call

**2.33** Since your background is in AIS, you have been asked to provide training to the other accountants in your company about the new accounting system design. How would you explain to your colleagues about the three tiers in an accounting system architecture? (Q2.1)

The three-tier architecture of the accounting system explained in the Accounting Databases: Behind the Screen section and figures 2.1 and 2.2 in the textbook could be a good start. Your explanation could include that an accounting system is divided into three separate but related components:
1. Accounting Database and database software (DBMS) that manipulates the accounting database (database tier)
2. Accounting application that performs accounting transactions such as creating invoice (application tier).
3. The user interface application which provide graphical user interface tools such as forms and reports (user tier).

**2.34** You have been called in as a consultant to act as a liaison between the accountants and the IT professionals at a company. The accountants are complaining that they must re-enter all the customer information each time an order is placed. The accountants see this as inefficient and time consuming with no value added.

The only response from the IT professionals has been to say that the database tables need to be normalized. The accountants have asked you what this means. Communication between the two groups of professionals has deteriorated.

How would you facilitate communication between the accountants and the IT professionals? How would you explain to both sides what is needed to resolve the issue? (Q2.4)

Here is one way to facilitate communications between your department and IT:
Entering same piece of data several times into the database is a sign of data duplication in one or more database tables. First you have to explain to accountants what data duplication in a database table is and why this is a problem. In this chapter data duplication and associated problems are discussed in a language that is understandable by accountants. Second, you explain that a technique called normalization by IT professionals could be implemented to remove duplicate data.

**2.35** Your company is expanding its operations to include overseas markets. Your supervisor asked you to prepare a summary explaining changes to the CUSTOMER database table that need to be implemented as a result of the overseas expansion. (Q2.3, 2.4)

When a customer table contains data about customers who live in different countries, then the customer table should contain some additional fields. At the same time some existing fields' size and type should be modified. The list of additional fields includes:
- Name type (in some culture first name comes after last name)
- Additional Address Info
- Province (that is State in the U.S.)
- Country
- Additional tables also needed to include information for drop down lists used in the data entry forms. For example, there should be a table to hold country names.

**2.36** You work at a university and have been assigned to a project team to update the university database to include information about employee dependents. The university provides tuition free to all employee dependents and wants to track dependent information to estimate free tuition in the future.
One of the project team members has suggested simply adding the employee dependent information to the EMPLOYEE database table. What do you think? Is this advisable? Prepare your notes to respond to his suggestion at the next team meeting. (Q2.3, 2.4)

An employee may have more than one dependent. If you want to add the employee dependents' information to the employee table, then you need to add, for each dependent, an additional record for that

employee. That would cause data duplication. The best solution is to add a new table and store employee dependent information in that table. The employee ID that is the primary key in the employee table will be the foreign key in the new table. The dependent ID could be used as the primary key for the dependent table.

**2.37** Your supervisor would like to know why calculated fields are typically not included as database fields in accounting software. Prepare a short report on advantages and disadvantages of including and not including the calculated field for your advisor.

Answer:
Your report should include an explanation of the calculated field and different types of it and the advantages and disadvantages of saving calculated fields within the record. The following is a brief explanation and states the advantages and disadvantages of saving calculated field in a record.

Calculated fields are of two specific types. The first type of calculated filed is a database table field that allows you to generate information that can change when other table fields' value changes, such as age. The value of this type of calculated field is not stored within the database record, but is instead calculated or computed based on the values of other fields within that record, using specific formulas. These formulas can consist of values from other fields, constants, and the results of other formulas or functions.

The second type of calculated field is a database field whose value is calculated only once since the value of fields used to calculate this field value remain constant though time, such as sales order total amount. Usually, the value of these types of fields is stored within the database record. It will be much faster to extract and display this type of calculated field since redundant calculation is avoided. However, storing these values increases the space used by the database tables on the storage devices.


# Tech in Practice

## Tech Exercises

### 2.38
**Tech Tool:** Database Software
**Software Videos:** Database Tables, Database Table Relationships

EspressoCoffee asked for your assistance in building database tables to record sales transactions.
1. Using Microsoft Access database software and information in Figure 2.21, build the following database tables. Identify the primary key for each table.
2. CUSTOMER table
   - SALES ORDER table
   - SALES ORDER LINE table
   - ITEM table
3. Identify the table relationships between the CUSTOMER, SALES ORDER, SALES ORDER LINE, and ITEM tables. Use database software to create the database table relationships.
   Relationships:
   - CUSTOMER and SALES ORDER: one-to-many
   - SALES ORDER and SALES ORDER LINE: one-to-many
   - ITEM and SALES ORDER LINE: one-to-many

4. Print the table relationships.

See *Tech Ex 2.38 SOLUTION* in the *Chapter 2 Exercises Solutions* folder.


**2.39** (Continuation of Tech Ex 2.38)

**Tech Tool:** Database Software
**Software Video:** Database Tables
This is a continuation of the previous exercise. EspressoCoffee asked for your assistance in entering data into database tables to record sales transactions.

1. Using Microsoft Access database software and your database file from the previous exercise, enter the following customer information into the CUSTOMER table.

| CUSTOMER NO | COMPANY NAME | LAST NAME | FIRST NAME | STREET ADDRESS | CITY | STATE | ZIP | COUNTRY | ACCOUNT BALANCE |
|---|---|---|---|---|---|---|---|---|---|
| 127127 | | Ashuer | Angela | 13 Joseph Ave | Appleton | WI | 54911 | USA | $1080.00 |
| 913691 | EspressoBar | Pico | Vincent | 58 Dante | Pisa | Tuscany | 43001 | Italy | $530.00 |

2. Enter the following items into the ITEM table.

| ITEM NO | ITEM NAME | ITEM DESCRIPTION |
|---|---|---|
| 9XB | Espresso Machine Lux | Espresso Machine Lux Model 2009 all electronic |
| ARQ1 | Pure Arabica | Pure Arabica from Colombia and Africa |
| ARXC | Arabica Colombian Mix | Arabica Colombian Mix - 60% Arabica 40% Colombian |
| BB6-1 | Espresso Machine Base | Espresso Machine Base Model 2001 with foam feature |
| WC1 | Small Cups | Small Cups - White small espresso cups |
| WC2 | Small Cup Lux | Small Cups Lux - White small espresso cups quality |

3. Enter the following sales into the SALES ORDER table and the SALES ORDER LINE table.
   - On December 5, 2012, customer Angela Ashuer places an order to buy the following items:
     **a.** (2) Item No. ARXC for $40 each
   - On December 22, 2012, customer Vincent Pico places an order to buy the following items:
     **a.** (1) Item No. 9XB for $400 each
     **b.** (12) Item No. WC1 for $15 each

Tables' integrity is enforced in MS Access. You cannot enter an order in the Order table for a non-existing customer. You cannot enter an order line record if there is no order for that order line record. You cannot enter an item in the Order Line Table if there is no such an item in the Item table. To enter data without violating the table's integrity, follow these steps:
   1. Enter customers in the CUSTOMER table.
   2. Enter items in the ITEM table.
   3. Enter orders in the SALES ORDER table using for example order number 100 for Angela and 101for Vincent.
   4. Enter the orders' details in the SALES ORDER LINE table.
   5. Print the CUSTOMER, SALES ORDER, SALES ORDER LINE, and ITEM tables.

See *Tech Ex 2.39 SOLUTION* in the *Chapter 2 Exercises Solutions* folder.


## 2.40

**Tech Tool:** Database Software
**Software Videos:** Database Tables, Database Table Relationships
Complete the following:
   1. Select an authentic enterprise of your choice. Using Microsoft Access database software, develop the following tables for the enterprise, identify appropriate fields, and select the primary keys.
   2. Customer table
      - SALES ORDER table
      - SALES ORDER LINE table
      - ITEM table
   3. Identify the relationships between the tables as one-to-one, one-to-many, or many-to-many.

4. Use Microsoft Access database software to create the database table relationships.
5. Print the table relationships.
6. Populate the tables with at least three records of test data.

The answer to this question depends on the students' choice of enterprise. However, the solution should not be far from the answer to the preceding question. One of the major differences could be the number of the fields in these tables, since organizations collect difference types of data from business entities.


## 2.41

**Tech Tool:** Database Software
**Software Videos:** Database Tables, Database Table Relationships
EspressoCoffee buys coffee beans from vendors in South America and Africa and needs a database table to collect information about the company's vendors.
1.             Use the following fields to build a VENDOR table.

| Vendor No. | Vendor ZIP |
|---|---|
| Vendor Name | Vendor Country |
| Vendor Street Address | Vendor Email |
| Vendor City | Vendor Web Site |
| Vendor State | |

2. Identify and add the primary key for the VENDOR table.

See *Tech Ex 2.41 SOLUTION* in the *Chapter 2 Exercises Solutions* folder.


## 2.42

**Tech Tool:** Database Software
**Software Videos:** Database Tables, Database Table Relationships
EspressoCoffee has asked for your assistance in building database tables to record purchase transactions. Use the following EspressoCoffee purchase order and MS Access database software to complete the following.
1.             Build the database tables for EspressoCoffee purchase transactions. (Hint: You should have four tables.)
2.             Enter the fields you think appropriate for each database table.
3.             Select the primary key(s) for each database table.
4.             Remove any many-to-many relationships using intersection tables.
5.             Build the relationships among the tables and print.

We can identify VENDOR, PURCHASE ORDER, and ITEM tables from this form.
A purchase order form includes one or more items and an item may appear in more than one purchase order therefore, the relationship between the ITEM table and PURCHASE ORDER table is many-to-many. We should follow the same steps explained in the text to remove this type of relationship. The result will be the PURCHASE ORDER LINE intersection table.
         As you can see, certain data are missing from this form. These missing fields may include tax amount and shipping charge. But these pieces of data are not necessary missing from the database tables. Also, there must be a way that the detailed purchase order information is displayed.

See *Tech Ex 2.42 SOLUTION* in the *Chapter 2 Exercises Solutions* folder.


## 2.43

Tech Tool: Database Software
Software Video: Database Tables
Ethan, your coworker, who unfortunately didn't take accounting information systems course while studying accounting, wants you to help him to understand database anomalies. To help your coworker, build a table in MS Access with the following fields and data. Show Ethan deletion, update, and insertion anomalies.

| Vendor No | Item Code | Vendor First Name | Vendor Last Name | Vendor City | Item Name | Item Description | Quantity | Unit Price |
|---|---|---|---|---|---|---|---|---|
| 120 | 23MX | Mark | Kwinsky | St. Louis | Accx 202 | Accelerator gas pedal | 3 | $60 |
| 234 | 10SP | Jim | Maranda | Chicago | SW6B | Switch pin | 12 | $7.20 |
| 127 | 10U2 | Mary | Vedette | Tulsa | 52SET | Under seat bar | 1 | $56 |
| 120 | PP10 | Mark | Kwinsky | St. Louis | BrkL | Left Break | 1 | $150 |
| 120 | WX30 | Mark | Kwinsky | St. Louis | BrkR | Right Break | 1 | $150 |

Answer:
To select a specific record you need the Vendor No and Item Code. The Vendor No plus Item Code together represent the primary key (record key).
Update anomaly: If you want to update a field (for example, Vendor City for Mark Kwinsky), you have to update three records (redundancy).
Deletion anomaly: If you have to delete a field (for example, Mark Kwinsky), you not only delete Mark's information, but information about items he sold!
Insertion anomaly: If you want to insert a new Vendor who didn't sell any items yet, then you don't have the record key partial value! Actually, no database engine allows you such action.

See *Tech Ex 2.43 SOLUTION* in the *Chapter 2 Exercises Solutions* folder.


**2.44**
Tech Tool: Database Software
Software Video: Database Tables
Use information provided in the 2.43 exercise table and your understanding of the database anomalies to create database tables that hold the same data, which is in the exercise 2.43 table but do not have any anomalies.
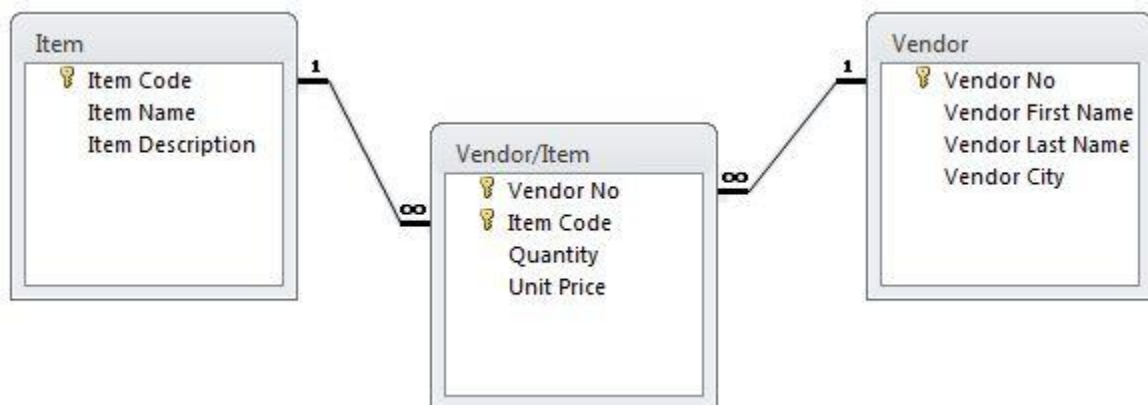
Answer:
You can break this table into three tables, none of which have any insertion, deletion, and update anomalies
These three tables are:
- Vendor Table
- Item Table
- Vendor/Item Table

Use the "Tech Ex 2.44 SOLUTION.accdb" database and try to update, delete, and insert new records. The following figure shows the database tables and relationship among them.

## Go Online

**2.45** The CFO has asked you to research which external financial databases might be of value to the accounting department. Go online, search, and then prepare a list of external databases related to finance and accounting that you would recommend to the CFO.

There are many financial databases available online, the following are four examples of many online financial databases.
- The Global Financial Database (GFDatabase) - The GFDatabase provides data never before compiled into a single electronic format, spanning more than 200 global markets and extending coverage back to 1265. The GFDatabase includes the Six Original Topics below:
  - Asset Allocation Database
  - Commodity Database
  - Economic Database
  - Equity Database
  - Exchange Rate Database
  - Fixed Income Database
- The US Stocks Databases
- The UK Database
- The Real Estate Database

Source: http://www.globalfinancialdata.com/Databases/GFDatabase.html


**2.46** You are a member of the project team evaluating available database engines. Your assignment is to research the Oracle database engine. Go online and search for Oracle database products, such as Oracle 11g. Prepare a summary to take to your next team meeting.

The Oracle current database engine is Oracle 11g. All characteristics and available features of this database engine is available at http://www.oracle.com/us/products/database/index.html


**2.47** You are a member of the project team evaluating available database engines. Your assignment is to research the Microsoft SQL Server database engine. Go online and search for Microsoft SQL Server database. Prepare a summary to take to your next team meeting.

The most recent version of MS SQL Server is 2008 R2. You can find all information about this product at http://www.microsoft.com/sqlserver/2008/en/us/overview.aspx


**2.48** You have been talking to your project team about the importance of scrubbing dirty data. Some team members have asked you for examples of dirty data and its impact on companies. They don't see it as a problem. Go online and search for examples of dirty data to present to your team at the next team meeting.

The following sources are (May 30, 2011) used to answer the dirty data question:
1. http://www.gartner.com/it/page.jsp?id=501733
2. http://searchdatamanagement.techtarget.com/answer/Data-cleansing-The-business-impact-of-dirty-data


Students may find different sources and examples.

First we clarify the difference between dirty data and non-normal data. Sometimes, dirty data disguises as non-normal data. For example, if there isn't strong coding or strong data entry rules in place, you'll end up with inaccurate or redundant data, like this:

| FName | LName | Street | City | State | Zip |
|-------|-------|--------|------|-------|-----|
| Patrick | Shaw | 403 23rd Ave S | Seattle | WA | 98144 |
| Pat | Shaw | 403 23rd Ave S | Seattle | WA | 98144 |
| | Shaw | 403 23rd Ave S | Seattle | WA | 98144 |

In this example it can be challenging to figure out if each of those contact records is the same person. For example, if a person has two bank accounts, and one has a PO Box and the other has a street address, then that person ends up with the same first and last name but a different address. This is not a case of dirty data but this is redundant, or non-normal, data and dirty data is different.

Here are some examples of dirty data:
1. A date field that has various information in it:
   - 03/31/2007
   - March
   - 2nd Quarter
   - Not sure

2. Number fields that contain a combination of numbers and text:
   - 3
   - At least three
   - Not sure

3. Variations and misspellings of names:
   - WA
   - Wash.
   - Washington
4. Phone fields that contain more than one phone number or text:
   - 206-286-8880
   - (206) 957-8880
   - (206) 286-8880-Home
5. Addresses that aren't split into consistent fields for Street, City, State, Zip

You can see the challenges posed by dirty data and how it can be hard to fix. Dirty data problem fixes usually involve Excel, auto filtering, search and replace, and so on.


# Technology Projects

Technology Project 2
**Tech Tool:** Database Software
**Software Videos:** Database Tables, Database Table Relationships

Technology Project 2 is your opportunity to practice building database tables and relationships for iSportDesign. With this project, you will use Microsoft Access database software.

Your deliverables for this project include:
Deliverable 1. CUSTOMER table
Deliverable 2. SALES ORDER table

Deliverable 3. SALES ORDER LINE table
Deliverable 4. ITEM table
Deliverable 5. VENDOR table
Deliverable 6. PURCHASE ORDER table
Deliverable 7. PURCHASE ORDER LINE table
Deliverable 8. Table relationships

Visit www.pearsonhighered.com/kay to:

1. Download Technology Project 2 instructions.
2. Download files provided online for your convenience in completing the project deliverables.
3. Watch the videos with software instructions to complete this project at www.pearsonhighered.com/kay

See *Technology Project 2 SOLUTION* (MS Access) file in the *Chapter 2 Exercises Solutions* folder.