Problems

The Ch07_ConstructCo database stores data for a consulting company that tracks all charges to projects. The charges are based on the hours each employee works on each project. The structure and contents of the Ch07_ConstructCo database are shown in Figure P7.1.

FIGURE P7.1 THE CH07_CONSTRUCTCO DATABASE

Database name: Ch07_ConstructCo

Relational diagram

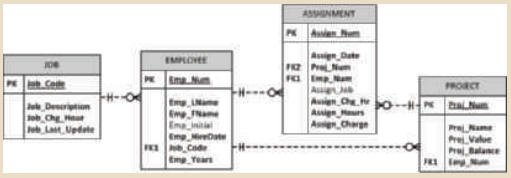


Table name: EMPLOYEE

EMP_NUM	EMP_LNAME	EMP_FNAME	EMP_INITIAL	EMP_HIREDATE	JOB_CODE	EMP_YEARS
101	News	John	G	08-Nov-00	502	17
102	Senior	David	H	12-Jul-89	501	28
103	Arbough	June	E	01-Dec-96	500	21
104	Ramoras	Anne	K	15-Nov-87	501	30
105	Johnson	Alice	K	01-Feb-93	502	25
106	Smithfield	William		22-Jun-04	500	13
107	Alonzo	Maria	D	10-Oct-93	500	24
108	Washington	Ralph	B	22-Aug-91	501	26
109	Smith	Larry	W	18-Jul-97	501	20
110	Olenko	Gerald	A	11-Dec-95	505	22
111	Wabash	Geoff	B	04-Apr-91	506	27
112	Smithson	Darlene	M	23-Oct-94	507	23
113	Joenbrood	Delbert	K	15-Nov-98	508	21
114	Jones	Annelise		20-Aug-93	508	24
115	Bawangi	Travis	B	25-Jan-92	501	26
116	Pratt	Gerald	L	05-Mar-97	510	21
117	Williamson	Angie	H	19-Jun-98	509	21
118	Frommer	James	J	04-Jan-05	510	13

Table name: JOB

JOB_CODE	JOB_DESCRIPTION	JOB_CHG_HOUR	JOB_LAST_UPDATE
500	Programmer	35.75	28-Nov-17
501	Systems Analyst	96.75	28-Nov-17
502	Database Designer	125.00	24-Mar-18
503	Electrical Engineer	84.50	28-Nov-17
504	Mechanical Engineer	67.90	28-Nov-17
505	Civil Engineer	55.78	28-Nov-17
506	Clerical Support	26.87	28-Nov-17
507	DSS Analyst	45.95	28-Nov-17
508	Applications Designer	48.10	24-Mar-18
509	Bio Technician	34.55	28-Nov-17
510	General Support	18.36	28-Nov-17

Table name: ASSIGNMENT

ASSIGN_NUM	ASSIGN_DATE	PROJ_NUM	EMP_NUM	ASSIGN_JOB	ASSIGN_CHG_HR	ASSIGN_HOURS	ASSIGN_CHARGE
1001	22-Mar-18 18	183	503		84.5	3.5	295.75
1002	22-Mar-18 22	117	509		34.55	4.2	145.11
1003	22-Mar-18 18	117	509		34.55	2	69.1
1004	22-Mar-18 18	183	503		84.5	5.9	498.55
1005	22-Mar-18 25	188	501		96.75	2.2	212.85
1006	22-Mar-18 22	184	501		96.75	4.2	406.35
1007	22-Mar-18 26	113	508		80.75	3.8	192.85
1008	22-Mar-18 18	183	503		84.5	0.9	76.05
1009	23-Mar-18 15	115	501		96.75	5.6	541.8
1010	23-Mar-18 15	117	509		34.55	2.4	82.92
1011	23-Mar-18 25	185	502		105	4.3	451.5
1012	23-Mar-18 18	188	501		96.75	3.4	328.95
1013	23-Mar-18 26	115	501		96.75	2	193.5
1014	23-Mar-18 22	184	501		96.75	2.8	270.9
1015	23-Mar-18 15	183	503		84.5	6.1	515.45
1016	23-Mar-18 22	185	502		105	4.7	493.5
1017	23-Mar-18 18	117	509		34.55	3.8	131.29
1018	23-Mar-18 25	117	509		34.55	2.2	76.01
1019	24-Mar-18 26	184	501		110.5	4.9	541.45
1020	24-Mar-18 15	181	502		125	3.1	387.5
1021	24-Mar-18 22	188	501		110.5	2.7	298.35
1022	24-Mar-18 22	115	501		110.5	4.9	541.45
1023	24-Mar-18 22	185	502		125	3.5	437.5
1024	24-Mar-18 15	183	503		84.5	3.3	278.85
1025	24-Mar-18 18	117	509		34.55	4.2	145.11

Table name: PROJECT

PROJ_NUM	PROJ_NAME	PROJ_VALUE	PROJ_BALANCE	EMP_NUM
15	Evergreen	1453500.00	1002350.00	103
18	Amber Wave	3508500.00	2110346.00	108
22	Rolling Tide	805000.00	500345.20	102
25	Starflight	2658500.00	2309880.00	107

Note that the ASSIGNMENT table in Figure P7.1 stores the JOB_CHG_HOUR values as an attribute (ASSIGN_CHG_HR) to maintain historical accuracy of the data. The JOB_CHG_HOUR values are likely to change over time. In fact, a JOB_CHG_HOUR change will be reflected in the ASSIGNMENT table. Naturally, the employee primary job assignment might also change, so the ASSIGN_JOB is also stored. Because those attributes are required to maintain the historical accuracy of the data, they are *not* redundant.

Given the structure and contents of the Ch07_ConstructCo database shown in Figure P7.1, use SQL commands to answer the following problems.

1. Write the SQL code required to list the employee number, last name, first name, and middle initial of all employees whose last names start with *Smith*. In other words, the rows for both Smith and Smithfield should be included in the listing. Sort the results by employee number. Assume case sensitivity.

2. Using the EMPLOYEE, JOB, and PROJECT tables in the Ch07_ConstructCo database, write the SQL code that will join the EMPLOYEE and PROJECT tables using EMP_NUM as the common attribute. Display the attributes shown in the results presented in Figure P7.2, sorted by project value.

FIGURE P7.2 THE QUERY RESULTS FOR PROBLEM 2

PROJ_NAME	PROJ_VALUE	PROJ_BALANCE	EMP_LNAME	EMP_FNAME	EMP_INITIAL	JOB_CODE	JOB_DESCRIPTION	JOB_CHG_HOUR
Rolling Tide	805000.00	500345.20	Senior	David	H	501	Systems Analyst	96.75
Evergreen	1453500.00	1002350.00	Arbough	June	E	500	Programmer	35.75
Starflight	2650500.00	2309880.00	Alonzo	Maria	D	500	Programmer	35.75
Amber Wave	3500500.00	2110346.00	Washington	Ralph	B	501	Systems Analyst	96.75

3. Write the SQL code that will produce the same information that was shown in Problem 2, but sorted by the employee's last name.
4. Write the SQL code that will list only the distinct project numbers in the ASSIGNMENT table, sorted by project number.
5. Write the SQL code to validate the ASSIGN_CHARGE values in the ASSIGNMENT table. Your query should retrieve the assignment number, employee number, project number, the stored assignment charge (ASSIGN_CHARGE), and the calculated assignment charge (calculated by multiplying ASSIGN_CHG_HR by ASSIGN_HOURS). Sort the results by the assignment number.
6. Using the data in the ASSIGNMENT table, write the SQL code that will yield the total number of hours worked for each employee and the total charges stemming from those hours worked, sorted by employee number. The results of running that query are shown in Figure P7.6.

FIGURE P7.6 TOTAL HOURS AND CHARGES BY EMPLOYEE

EMP_NUM	EMP_LNAME	SumOfASSIGN_HOURS	SumOfASSIGN_CHARGE
101	News	3.1	387.50
103	Arbough	19.7	1664.65
104	Ramoras	11.9	1218.70
105	Johnson	12.5	1382.50
108	Washington	8.3	840.15
113	Joenbrood	3.8	192.85
115	Bawangi	12.5	1276.75
117	Williamson	18.8	649.54

7. Write a query to produce the total number of hours and charges for each of the projects represented in the ASSIGNMENT table, sorted by project number. The output is shown in Figure P7.7.

FIGURE P7.7 TOTAL HOURS AND CHARGES BY PROJECT

PROJ_NUM	SumOfASSIGN_HOURS	SumOfASSIGN_CHARGE
15	20.5	1806.52
18	23.7	1544.80
22	27.0	2593.16
25	19.4	1668.16

8. Write the SQL code to generate the total hours worked and the total charges made by all employees. The results are shown in Figure P7.8.

FIGURE P7.8 TOTAL HOURS AND CHARGES, ALL EMPLOYEES

SumOfSumOfASSIGN_HOURS	SumOfSumOfASSIGN_CHARGE
90.6	7612.64

The structure and contents of the Ch07_SaleCo database are shown in Figure P7.9. Use this database to answer the following problems.

FIGURE P7.9 THE CH07_SALECO DATABASE

Relational diagram

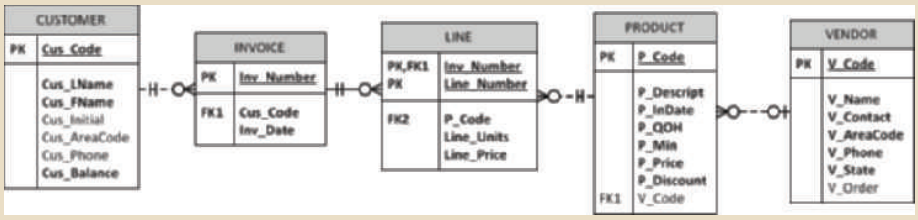


Table name: CUSTOMER

CUS_CODE	CUS_LNAME	CUS_FNAME	CUS_INITIAL	CUS_AREACODE	CUS_PHONE	CUS_BALANCE
10010	Ramas	Alfred	A	615	844-2573	0.00
10011	Dunne	Leona	K	713	894-1238	0.00
10012	Smith	Kathy	W	615	894-2285	345.86
10013	Olowski	Paul	F	615	894-2180	536.75
10014	Orlando	Myron		615	222-1672	0.00
10015	O'Brian	Amy	B	713	442-3381	0.00
10016	Brown	James	G	615	297-1228	221.19
10017	Williams	George		615	290-2556	768.93
10018	Farriss	Anne	G	713	382-7185	216.55
10019	Smith	Olette	K	615	297-3809	0.00

Table name: VENDOR

V_CODE	V_NAME	V_CONTACT	V_AREACODE	V_PHONE	V_STATE	V_ORDER
21225	Bryson, Inc.	Smithson	615	223-3234	TN	Y
21226	SuperLoo, Inc.	Flushing	904	215-8995	FL	N
21231	D&E Supply	Singh	615	228-3245	TN	Y
21344	Gomez Bros.	Ortega	615	889-2546	KY	N
22567	Dome Supply	Smith	901	678-1419	GA	N
23119	Randsets Ltd.	Anderson	901	678-3998	GA	Y
24004	Brackman Bros.	Browning	615	228-1410	TN	N
24288	ORDVA, Inc.	Hakford	615	898-1234	TN	Y
25443	B&K, Inc.	Smith	904	227-0093	FL	N
25501	Damal Supplies	Smythe	615	890-3529	TN	N
25595	Rubicon Systems	Orton	904	456-0092	FL	Y

Table name: INVOICE

INV_NUMBER	CUS_CODE	INV_DATE
1001	10014	16-Jan-18
1002	10011	16-Jan-18
1003	10012	16-Jan-18
1004	10011	17-Jan-18
1005	10018	17-Jan-18
1006	10014	17-Jan-18
1007	10015	17-Jan-18
1008	10011	17-Jan-18

Table name: LINE

INV_NUMBER	LINE_NUMBER	P_CODE	LINE_UNITS	LINE_PRICE
1001	1	13-Q2/P2	1	14.99
1001	2	23109-HB	1	9.95
1002	1	54778-2T	2	4.99
1003	1	2238/QPD	1	38.95
1003	2	1546-QQ2	1	39.95
1003	3	13-Q2/P2	5	14.99
1004	1	54778-2T	3	4.99
1004	2	23109-HB	2	9.95
1005	1	PVC23DRT	12	5.87
1006	1	SM-18277	3	6.99
1006	2	2232/QTY	1	109.92
1006	3	23109-HB	1	9.95
1006	4	89-WRE-Q	1	256.99
1007	1	13-Q2/P2	2	14.99
1007	2	54778-2T	1	4.99
1008	1	PVC23DRT	5	5.87
1008	2	AR3/TT3	3	119.95
1008	3	23109-HB	1	9.95

Table name: PRODUCT

P_CODE	P_DESCRIPT	P_INDATE	P_QOH	P_MIN	P_PRICE	P_DISCOUNT	V_CODE
11QER/31	Power painter, 15 psi, 3-nozzle	03-Nov-17	8	5	109.99	0.00	25595
13-Q2/P2	7.25-in. pwr. saw blade	13-Dec-17	32	15	14.99	0.05	21344
14-Q1/L3	8.00-in. pwr. saw blade	13-Nov-17	18	12	17.49	0.00	21344
1546-QQ2	Hrd. cloth, 1/4-in., 2x50	15-Jan-18	15	8	39.95	0.00	23119
1558-QW1	Hrd. cloth, 1/2-in., 3x50	15-Jan-18	23	5	43.99	0.00	23119
2232/QTY	B&D jigsaw, 12-in. blade	30-Dec-17	8	5	109.92	0.05	24288
2232/QWE	B&D jigsaw, 8-in. blade	24-Dec-17	6	5	99.87	0.05	24288
2238/QPD	B&D cordless drill, 1/2-in.	20-Jan-18	12	5	38.95	0.05	25595
23109-HB	Claw hammer	20-Jan-18	23	10	9.95	0.10	21225
23114-AA	Sledge hammer, 12 lb	02-Jan-18	8	5	14.40	0.05	
54778-2T	Rat-tail file, 1/8-in. fine	15-Dec-17	43	20	4.99	0.00	21344
89-WRE-Q	Hrd. chain saw, 16 in.	07-Feb-18	11	5	256.99	0.05	24288
PVC23DRT	PVC pipe, 3.5-in., 8-ft	20-Feb-18	188	75	5.87	0.00	
SM-18277	1.25-in. metal screw, 25	01-Mar-18	172	75	6.99	0.00	21225
SW-23116	2.5-in. wd. screw, 50	24-Feb-18	237	100	8.45	0.00	21231
AR3/TT3	Steel matting, 4'x8'x1/8", 5' mesh	17-Jan-18	18	5	119.95	0.10	25595

9. Write a query to count the number of invoices.
10. Write a query to count the number of customers with a balance of more than $500.
11. Generate a listing of all purchases made by the customers, using the output shown in Figure P7.11 as your guide. Sort the results by customer code, invoice number, and product description.

FIGURE P7.11 LIST OF CUSTOMER PURCHASES

CUS_CODE	INV_NUMBER	INV_DATE	P_DESCRIPT	LINE_UNITS	LINE_PRICE
10011	1002	16-Jan-18	Rat-tail file, 1/8-in. fine	2	4.99
10011	1004	17-Jan-18	Claw hammer	2	9.95
10011	1004	17-Jan-18	Rat-tail file, 1/8-in. fine	3	4.99
10011	1008	17-Jan-18	Claw hammer	1	9.95
10011	1008	17-Jan-18	PVC pipe, 3.5-in., 8-ft	5	5.87
10011	1008	17-Jan-18	Steel matting, 4'x8'x1/6", .5" mesh	3	119.95
10012	1003	16-Jan-18	7.25-in. pwr. saw blade	5	14.99
10012	1003	16-Jan-18	B&D cordless drill, 1/2-in.	1	38.95
10012	1003	16-Jan-18	Hrd. cloth, 1/4-in., 2x50	1	39.95
10014	1001	16-Jan-18	7.25-in. pwr. saw blade	1	14.99
10014	1001	16-Jan-18	Claw hammer	1	9.95
10014	1006	17-Jan-18	1.25-in. metal screw, 25	3	6.99
10014	1006	17-Jan-18	B&D jigsaw, 12-in. blade	1	109.92
10014	1006	17-Jan-18	Claw hammer	1	9.95
10014	1006	17-Jan-18	Hicut chain saw, 16 in.	1	256.99
10015	1007	17-Jan-18	7.25-in. pwr. saw blade	2	14.99
10015	1007	17-Jan-18	Rat-tail file, 1/8-in. fine	1	4.99
10018	1005	17-Jan-18	PVC pipe, 3.5-in., 8-ft	12	5.87

12. Using the output shown in Figure P7.12 as your guide, generate a list of customer purchases, including the subtotals for each of the invoice line numbers. The subtotal is a derived attribute calculated by multiplying LINE_UNITS by LINE_PRICE. Sort the output by customer code, invoice number, and product description. Be certain to use the column aliases as shown in the figure.

FIGURE P7.12 SUMMARY OF CUSTOMER PURCHASES WITH SUBTOTALS

CUS_CODE	INV_NUMBER	P_DESCRIPT	Units Bought	Unit Price	Subtotal
10011	1002	Rat-tail file, 1/8-in. fine	2	4.99	9.98
10011	1004	Claw hammer	2	9.95	19.90
10011	1004	Rat-tail file, 1/8-in. fine	3	4.99	14.97
10011	1008	Claw hammer	1	9.95	9.95
10011	1008	PVC pipe, 3.5-in., 8-ft	5	5.87	29.35
10011	1008	Steel matting, 4'x8'x1/6", .5" mesh	3	119.95	359.85
10012	1003	7.25-in. pwr. saw blade	5	14.99	74.95
10012	1003	B&D cordless drill, 1/2-in.	1	38.95	38.95
10012	1003	Hrd. cloth, 1/4-in., 2x50	1	39.95	39.95
10014	1001	7.25-in. pwr. saw blade	1	14.99	14.99
10014	1001	Claw hammer	1	9.95	9.95
10014	1006	1.25-in. metal screw, 25	3	6.99	20.97
10014	1006	B&D jigsaw, 12-in. blade	1	109.92	109.92
10014	1006	Claw hammer	1	9.95	9.95
10014	1006	Hicut chain saw, 16 in.	1	256.99	256.99
10015	1007	7.25-in. pwr. saw blade	2	14.99	29.98
10015	1007	Rat-tail file, 1/8-in. fine	1	4.99	4.99
10018	1005	PVC pipe, 3.5-in., 8-ft	12	5.87	70.44

13. Write a query to display the customer code, balance, and total purchases for each customer. Total purchase is calculated by summing the line subtotals (as calculated in Problem 12) for each customer. Sort the results by customer code, and use aliases as shown in Figure P7.13.

FIGURE P7.13 CUSTOMER PURCHASE SUMMARY

CUS_CODE	CUS_BALANCE	Total Purchases
10011	0.00	444.00
10012	345.86	153.85
10014	0.00	422.77
10015	0.00	34.97
10018	216.55	70.44

14. Modify the query in Problem 13 to include the number of individual product purchases made by each customer. (In other words, if the customer's invoice is based on three products, one per LINE_NUMBER, you count three product purchases. Note that in the original invoice data, customer 10011 generated three invoices, which contained a total of six lines, each representing a product purchase.) Your output values must match those shown in Figure P7.14, sorted by customer code.

FIGURE P7.14 CUSTOMER TOTAL PURCHASE AMOUNTS AND NUMBER OF PURCHASES

CUS_CODE	CUS_BALANCE	Total Purchases	Number of Purchases
10011	0.00	444.00	6
10012	345.86	153.85	3
10014	0.00	422.77	6
10015	0.00	34.97	2
10018	216.55	70.44	1

15. Use a query to compute the total of all purchases, the number of purchases, and the average purchase amount made by each customer. Your output values must match those shown in Figure P7.15. Sort the results by customer code.

FIGURE P7.15 AVERAGE PURCHASE AMOUNT BY CUSTOMER

CUS_CODE	CUS_BALANCE	Total Purchases	Number of Purchases	Average Purchase Amount
10011	0.00	444.00	6	74.00
10012	345.86	153.85	3	51.28
10014	0.00	422.77	6	70.46
10015	0.00	34.97	2	17.48
10018	216.55	70.44	1	70.44

16. Create a query to produce the total purchase per invoice, generating the results shown in Figure P7.16, sorted by invoice number. The invoice total is the sum of the product purchases in the LINE that corresponds to the INVOICE.

FIGURE P7.16 INVOICE TOTALS

INV_NUMBER	Invoice Total
1001	24.94
1002	9.98
1003	153.85
1004	34.87
1005	70.44
1006	397.83
1007	34.97
1008	399.15

17. Use a query to show the invoices and invoice totals in Figure P7.17. Sort the results by customer code and then by invoice number.

FIGURE P7.17 INVOICE TOTALS BY CUSTOMER

CUS_CODE	INV_NUMBER	Invoice Total
10011	1002	9.98
10011	1004	34.87
10011	1008	399.15
10012	1003	153.85
10014	1001	24.94
10014	1006	397.83
10015	1007	34.97
10018	1005	70.44

18. Write a query to produce the number of invoices and the total purchase amounts by customer, using the output shown in Figure P7.18 as your guide. Note the results are sorted by customer code. (Compare this summary to the results shown in Problem 17.)

FIGURE P7.18 NUMBER OF INVOICES AND TOTAL PURCHASE AMOUNTS BY CUSTOMER

CUS_CODE	Number of Invoices	Total Customer Purchases
10011	3	444.00
10012	1	153.85
10014	2	422.77
10015	1	34.97
10018	1	70.44

19. Write a query to generate the total number of invoices, the invoice total for all of the invoices, the smallest of the customer purchase amounts, the largest of the customer purchase amounts, and the average of all the customer purchase amounts. Your output must match Figure P7.19.

FIGURE P7.19 NUMBER OF INVOICES, INVOICE TOTALS, MINIMUM, MAXIMUM, AND AVERAGE SALES

Total Invoices	Total Sales	Minimum Customer Purchases	Largest Customer Purchases	Average Customer Purchases
8	1126.03	34.97	444.00	225.21

20. List the balances of customers who have made purchases during the current invoice cycle—that is, for the customers who appear in the INVOICE table. The results of this query are shown in Figure P7.20, sorted by customer code.

FIGURE P7.20 BALANCES FOR CUSTOMERS WHO MADE PURCHASES

CUS_CODE	CUS_BALANCE
10011	0.00
10012	345.86
10014	0.00
10015	0.00
10018	216.55

21. Provide a summary of customer balance characteristics for customers who made purchases. Include the minimum balance, maximum balance, and average balance, as shown in Figure P7.21.

FIGURE P7.21 BALANCE SUMMARY FOR CUSTOMERS WHO MADE PURCHASES

Minimum Balance	Maximum Balance	Average Balance
0	345.86	112.48

22. Create a query to find the balance characteristics for all customers, including the total of the outstanding balances. The results of this query are shown in Figure P7.22.

FIGURE P7.22 BALANCE SUMMARY FOR ALL CUSTOMERS

Total Balances	Minimum Balance	Maximum Balance	Average Balance
2089.28	0.00	768.93	208.93

23. Find the listing of customers who did not make purchases during the invoicing period. Sort the results by customer code. Your output must match the output shown in Figure P7.23.

FIGURE P7.23 BALANCES OF CUSTOMERS WHO DID NOT MAKE PURCHASES

CUS_CODE	CUS_BALANCE
10010	0.00
10013	536.75
10016	221.19
10017	768.93
10019	0.00

24. Find the customer balance summary for all customers who have not made purchases during the current invoicing period. The results are shown in Figure P7.24.

FIGURE P7.24 SUMMARY OF CUSTOMER BALANCES FOR CUSTOMERS WHO DID NOT MAKE PURCHASES

Total Balance	Minimum Balance	Maximum Balance	Average Balance
1526.87	0.00	768.93	305.37

25. Create a query that summarizes the value of products currently in inventory. Note that the value of each product is a result of multiplying the units currently in inventory by the unit price. Sort the results in descending order by subtotal, as shown in Figure P7.25.

FIGURE P7.25 VALUE OF PRODUCTS CURRENTLY IN INVENTORY

P_DESCRIPT	P_QOH	P_PRICE	Subtotal
Hicut chain saw, 16 in.	11	256.99	2826.89
Steel matting, 4'x8'x1/6", .5" mesh	18	119.95	2159.10
2.5-in. wd. screw, 50	237	8.45	2002.65
1.25-in. metal screw, 25	172	6.99	1202.28
PVC pipe, 3.5-in., 8-ft	188	5.87	1103.56
Hrd. cloth, 1/2-in., 3x50	23	43.99	1011.77
Power painter, 15 psi., 3-nozzle	8	109.99	879.92
B&D jigsaw, 12-in. blade	8	109.92	879.36
Hrd. cloth, 1/4-in., 2x50	15	39.95	599.25
B&D jigsaw, 8-in. blade	6	99.87	599.22
7.25-in. pwr. saw blade	32	14.99	479.68
B&D cordless drill, 1/2-in.	12	38.95	467.40
9.00-in. pwr. saw blade	18	17.49	314.82
Claw hammer	23	9.95	228.85
Rat-tail file, 1/8-in. fine	43	4.99	214.57
Sledge hammer, 12 lb.	8	14.40	115.20

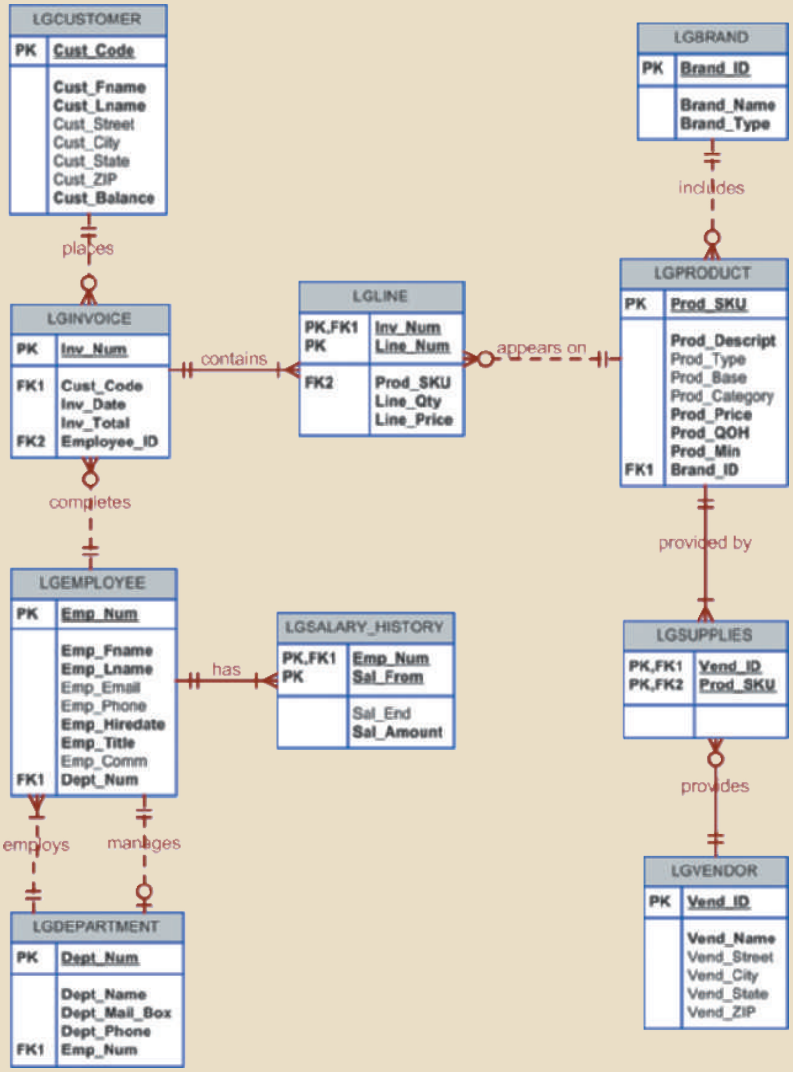
26. Find the total value of the product inventory. The results are shown in Figure P7.26.

FIGURE P7.26 TOTAL VALUE OF ALL PRODUCTS IN INVENTORY

Total Value of Inventory
15084.52

The Ch07_LargeCo database (see Figure P7.27) stores data for a company that sells paint products. The company tracks the sale of products to customers. The database keeps data on customers (LGCUSTOMER), sales (LGINVOICE), products (LGPRODUCT), which products are on which invoices (LGLINE), employees (LGEMPLOYEE), the salary history of each employee (LGSALARY_HISTORY), departments (LGDEPARTMENT), product brands (LGBRAND), vendors (LGVENDOR), and which vendors supply each product (LGSUPPLIES). Some of the tables contain only a few rows of data, while other tables are quite large; for example, there are only eight departments, but more than 3,300 invoices containing over 11,000 invoice lines. For Problems 28–55, a figure of the correct output for each problem is provided. If the output of the query is very large, only the first several rows of the output are shown.

FIGURE P7.27 THE CH07_LARGECO ERD



27. Write a query to display the eight departments in the LGDEPARTMENT table sorted by department name.

28. Write a query to display the SKU (stock keeping unit), description, type, base, category, and price for all products that have a PROD_BASE of Water and a PROD_CATEGORY of Sealer (Figure P7.28).

FIGURE P7.28 WATER-BASED SEALERS

PROD_SKU	PROD_DESCRIPT	PROD_TYPE	PROD_BASE	PROD_CATEGORY	PROD_PRICE
1403-TUY	Sealer, Water Based, for Concrete Floors	Interior	Water	Sealer	42.99

29. Write a query to display the first name, last name, and email address of employees hired from January 1, 2005, to December 31, 2014. Sort the output by last name and then by first name (Figure P7.29).

FIGURE P7.29 EMPLOYEES HIRED FROM 2005–2014

EMP_FNAME	EMP_LNAME	EMP_EMAIL
SUE	ASH	S.ASH99@LGCOMPANY.COM
ALIDA	BLACKWELL	A.BLACKW99@LGCOMPANY.COM
PHOEBE	BLEDSOE	P.BLEDSO99@LGCOMPANY.COM
VALARIE	BLEDSOE	V.BLEDSO99@LGCOMPANY.COM
WILFORD	BURGOS	W.BURGOS6@LGCOMPANY.COM
KASEY	CASH	K.CASH0@LGCOMPANY.COM
DANICA	CASTLE	C.DANICA99@LGCOMPANY.COM
DOUG	CAUDILL	C.DOUG0@LGCOMPANY.COM
LUCIO	CAUDILL	L.CAUDIL4@LGCOMPANY.COM
HANNAH	COLEMAN	H.COLEMA7@LGCOMPANY.COM
PHILLIS	CONKLIN	P.CONKLI4@LGCOMPANY.COM
LEE	CONNOR	L.CONNOR99@LGCOMPANY.COM

30. Write a query to display the first name, last name, phone number, title, and department number of employees who work in department 300 or have the title "CLERK I." Sort the output by last name and then by first name (Figure P7.30).

FIGURE P7.30 CLERKS AND EMPLOYEES IN DEPARTMENT 300

EMP_FNAME	EMP_LNAME	EMP_PHONE	EMP_TITLE	DEPT_NUM
LAVINA	ACEVEDO	862-6787	ASSOCIATE	300
LAUREN	AVERY	560-2270	SENIOR ASSOCIATE	300
ROSALBA	BAKER	632-8197	ASSOCIATE	300
FERN	CARPENTER	735-4820	PURCHASING SPECIALIST	300
LEEANN	CLINTON	616-9615	CLERK I	600
TANIKA	CRANE	449-6336	PURCHASING SPECIALIST	300
SAMMY	DIGGS	525-2101	SENIOR ASSOCIATE	300
LANA	DOWDY	471-8795	SENIOR ASSOCIATE	300
STEPHAINE	DUNLAP	618-8203	BUYER - RAW MATERIALS	300
HAL	FISHER	676-3662	SENIOR ASSOCIATE	300
LINDSAY	GOOD	337-9570	CLERK I	600
LEEANN	HORN	828-4361	SENIOR ASSOCIATE	300

31. Write a query to display the employee number, last name, first name, salary "from" date, salary end date, and salary amount for employees 83731, 83745, and 84039. Sort the output by employee number and salary "from" date (Figure P7.31).

FIGURE P7.31 SALARY HISTORY FOR SELECTED EMPLOYEES

EMP_NUM	EMP_LNAME	EMP_FNAME	SAL_FROM	SAL_END	SAL_AMOUNT
83731	VARGAS	SHERON	7/15/2014	7/14/2015	43740
83731	VARGAS	SHERON	7/14/2015	7/13/2016	48110
83731	VARGAS	SHERON	7/14/2016	7/14/2017	49550
83731	VARGAS	SHERON	7/15/2017		51040
83745	SPICER	DWAIN	8/2/2011	8/1/2012	56020
83745	SPICER	DWAIN	8/2/2012	8/2/2013	57700
83745	SPICER	DWAIN	8/3/2013	8/1/2014	63470
83745	SPICER	DWAIN	8/2/2014	8/1/2015	68550
83745	SPICER	DWAIN	8/1/2015	7/31/2016	71980
83745	SPICER	DWAIN	8/1/2016	8/1/2017	74140
83745	SPICER	DWAIN	8/2/2017		76360
84039	COLEMAN	HANNAH	6/28/2014	6/27/2015	47380
84039	COLEMAN	HANNAH	6/27/2015	6/26/2016	51170
84039	COLEMAN	HANNAH	6/27/2016	6/27/2017	52700
84039	COLEMAN	HANNAH	6/28/2017		54280

32. Write a query to display the first name, last name, street, city, state, and zip code of any customer who purchased a Foresters Best brand top coat between July 15, 2015, and July 31, 2015. If a customer purchased more than one such product, display the customer's information only once in the output. Sort the output by state, last name, and then first name (Figure P7.32).

FIGURE P7.32 CUSTOMERS WHO PURCHASED FORESTERS BEST TOP COAT

CUST_FNAME	CUST_LNAME	CUST_STREET	CUST_CITY	CUST_STATE	CUST_ZIP
LUPE	SANTANA	1292 WEST 70TH PLACE	Phenix City	AL	36867
HOLLIS	STILES	1493 DOLLY MADISON CIRCLE	Snow Hill	AL	36778
LISETTE	WHITTAKER	339 NORTHPARK DRIVE	Montgomery	AL	36197
DEANDRE	JAMISON	1571 HANES STREET	Miami	FL	33169
CATHLEEN	WHITMAN	1712 NORTHFIELD DRIVE	Marshallville	GA	31057
SHERIE	STOVER	640 MOUNTAIN VIEW DRIVE	Parksville	KY	40464
BRYCE	HOGAN	1860 IMLACH DRIVE	Newbury	MA	01951
SHELBY	SALAS	486 SUSITNA VIEW COURT	North Tisbury	MA	02568
JERMAINE	HANCOCK	1627 SAUNDERS ROAD	Ellicott City	MD	21041
WHITNEY	WHITFIELD	1259 RHONE STREET	Phippsburg	ME	04567
MONROE	ALLISON	272 SCHODDE STREET	Kalamazoo	MI	49002
DARLEEN	PARRA	561 COLLIE HILL WAY	Madison	MS	39130
CLINTON	AGUIRRE	1651 VANGUARD DRIVE	Franklinville	NC	27248
TOMMIE	PALMER	933 ELCADORE CIRCLE	Arapahoe	NC	28510
JEFFEREY	MCBRIDE	1043 ROCKRIDGE DRIVE	Glenwood	NJ	07418
SIDNEY	GARZA	772 SHEPPARD DRIVE	Fair Harbor	NY	11706
TAMELA	GUIDRY	1873 BAXTER ROAD	Brooklyn	NY	11252
KAREN	LEVINE	1534 PALMER COURT	Cincinnati	OH	45218
STEPHENIE	MCKENZIE	1039 DELAWARE PLACE	Wilkes Barre	PA	18763
LAN	NICHOLS	367 LAKEVIEW DRIVE	Pittsburgh	PA	15262
KASEY	SOSA	975 WEST 96TH AVENUE	Kinzers	PA	17535
SHELBY	THAYER	1634 RUANE ROAD	Bordeaux	SC	29835
WILSON	BELL	1127 CUNNINGHAM STREET	Louisville	TN	37777
RENATE	LADD	652 LEWIS STREET	Crystal City	VA	22202
MELONIE	JIMENEZ	848 DOWNEY FINCH LANE	East Monkton	VT	05443

33. Write a query to display the employee number, last name, email address, title, and department name of each employee whose job title ends in the word "ASSOCIATE." Sort the output by department name and employee title (Figure P7.33).

FIGURE P7.33 EMPLOYEE WITH THE TITLE OF ASSOCIATE

EMP_NUM	EMP_LNAME	EMP_EMAIL	EMP_TITLE	DEPT_NAME
84526	LASSITER	F.LASSIT8@LGCOMPANY.COM	ASSOCIATE	ACCOUNTING
83517	ALBRIGHT	SO.ALBR96@LGCOMPANY.COM	ASSOCIATE	ACCOUNTING
84386	RIVERA	D.RIVERA76@LGCOMPANY.COM	ASSOCIATE	ACCOUNTING
83378	DUNHAM	F.DUNHAM5@LGCOMPANY.COM	ASSOCIATE	ACCOUNTING
83583	ROLLINS	M.ROLLIN99@LGCOMPANY.COM	ASSOCIATE	ACCOUNTING
83661	FINN	D.FINN87@LGCOMPANY.COM	ASSOCIATE	ACCOUNTING
84383	WASHINGTON	L.WASHIN98@LGCOMPANY.COM	ASSOCIATE	CUSTOMER SERVICE
84206	HEALY	N.HEALY82@LGCOMPANY.COM	ASSOCIATE	CUSTOMER SERVICE
83451	ELLIS	R.ELLIS81@LGCOMPANY.COM	ASSOCIATE	CUSTOMER SERVICE
84442	GREGORY	A.GREGOR95@LGCOMPANY.COM	ASSOCIATE	CUSTOMER SERVICE
84459	GILLIAM	E.GILLIA10@LGCOMPANY.COM	ASSOCIATE	CUSTOMER SERVICE
84300	SEAY	A.SEAY75@LGCOMPANY.COM	ASSOCIATE	CUSTOMER SERVICE

34. Write a query to display a brand name and the number of products of that brand that are in the database. Sort the output by the brand name (Figure P7.34).

FIGURE P7.34 NUMBER OF PRODUCTS OF EACH BRAND

BRAND_NAME	NUMPRODUCTS
BINDER PRIME	27
BUSTERS	25
FORESTERS BEST	15
HOME COMFORT	36
LE MODE	36
LONG HAUL	41
OLDE TYME QUALITY	27
STUTTENFURST	27
VALU-MATTE	18

35. Write a query to display the number of products in each category that have a water base, sorted by category (Figure P7.35).

FIGURE P7.35 NUMBER OF WATER-BASED PRODUCTS IN EACH CATEGORY

PROD_CATEGORY	NUMPRODUCTS
Cleaner	2
Filler	2
Primer	16
Sealer	1
Top Coat	81

36. Write a query to display the number of products within each base and type combination, sorted by base and then by type (Figure P7.36).

FIGURE P7.36 NUMBER OF PRODUCTS OF EACH BASE AND TYPE

PROD_BASE	PROD_TYPE	NUMPRODUCTS
Solvent	Exterior	67
Solvent	Interior	83
Water	Exterior	39
Water	Interior	63

37. Write a query to display the total inventory—that is, the sum of all products on hand for each brand ID. Sort the output by brand ID in descending order (Figure P7.37).

FIGURE P7.37 TOTAL INVENTORY OF EACH BRAND OF PRODUCTS

BRAND_ID	TOTALINVENTORY
35	2431
33	2158
31	1117
30	3012
29	1735
28	2200
27	2586
25	1829
23	1293

38. Write a query to display the brand ID, brand name, and average price of products of each brand. Sort the output by brand name. Results are shown with the average price rounded to two decimal places (Figure P7.38).

FIGURE P7.38 AVERAGE PRICE OF PRODUCTS OF EACH BRAND

BRAND_ID	BRAND_NAME	AVGPRICE
33	BINDER PRIME	16.12
29	BUSTERS	22.59
23	FORESTERS BEST	20.94
27	HOME COMFORT	21.8
35	LE MODE	19.22
30	LONG HAUL	20.12
28	OLDE TYME QUALITY	18.33
25	STUTTENFURST	16.47
31	VALU-MATTE	16.84

39. Write a query to display the department number and most recent employee hire date for each department. Sort the output by department number (Figure P7.39).

FIGURE P7.39 MOST RECENT HIRE IN EACH DEPARTMENT

DEPT_NUM	MOSTRECENT
200	6/8/2007
250	12/15/2017
280	4/16/2016
300	12/12/2016
400	1/26/2017
500	4/26/2017
550	10/22/2017
600	10/2/2017

40. Write a query to display the employee number, first name, last name, and largest salary amount for each employee in department 200. Sort the output by largest salary in descending order (Figure P7.40).

FIGURE P7.40 LARGEST SALARY AMOUNT FOR EACH EMPLOYEE IN DEPARTMENT 200

EMP_NUM	EMP_FNAME	EMP_LNAME	LARGESTSALARY
83509	FRANKLYN	STOVER	210000
83705	JOSE	BARR	147000
83537	CLEO	ENGLISH	136000
83565	LOURDES	ABERNATHY	133000
83593	ROSANNE	NASH	129000
83621	FONDA	GONZALEZ	126000
83649	DELMA	JACOB	123000
83677	HERB	MANNING	120000
83906	BRADFORD	BRAY	117000
83734	INEZ	ROCHA	112000
84049	LANE	BRANDON	110000
83763	JAIME	FELTON	107000

41. Write a query to display the customer code, first name, last name, and sum of all invoice totals for customers with cumulative invoice totals greater than $1,500. Sort the output by the sum of invoice totals in descending order (Figure P7.41).

FIGURE P7.41 SUM OF CUSTOMER PURCHASES FOR CUSTOMERS PURCHASING MORE THAN $1500

CUST_CODE	CUST_FNAME	CUST_LNAME	TOTALINVOICES
215	CHARMAINE	BRYAN	3134.15
98	VALENTIN	MARINO	3052.46
152	LISETTE	WHITTAKER	3042.78
117	KARON	MATA	3009.63
97	ERWIN	ANDERSON	2895.49
112	LAN	NICHOLS	2867.14
118	JESSE	HICKS	2786.55
220	ABRAHAM	PLATT	2187.26
103	CORRINA	GIFFORD	2122.07
302	SHIRLENE	FITCH	2046.31
173	INGRID	HARDY	2040.31
132	JANIS	DUBOIS	2015.62

42. Write a query to display the department number, department name, department phone number, employee number, and last name of each department manager. Sort the output by department name (Figure P7.42).

FIGURE P7.42 DEPARTMENT MANAGERS

DEPT_NUM	DEPT_NAME	DEPT_PHONE	EMP_NUM	EMP_LNAME
600	ACCOUNTING	555-2333	84583	YAZZIE
250	CUSTOMER SERVICE	555-5555	84001	FARMER
500	DISTRIBUTION	555-3624	84052	FORD
280	MARKETING	555-8500	84042	PETTIT
300	PURCHASING	555-4873	83746	RANKIN
200	SALES	555-2824	83509	STOVER
550	TRUCKING	555-0057	83683	STONE
400	WAREHOUSE	555-1003	83759	CHARLES

43. Write a query to display the vendor ID, vendor name, brand name, and number of products of each brand supplied by each vendor. Sort the output by vendor name and then by brand name (Figure P7.43).

FIGURE P7.43 NUMBER OF PRODUCTS OF EACH BRAND SUPPLIED BY EACH VENDOR

VEND_ID	VEND_NAME	BRAND_NAME	NUMPRODUCTS
8	Baltimore Paints Consolidated	BINDER PRIME	27
8	Baltimore Paints Consolidated	FORESTERS BEST	1
8	Baltimore Paints Consolidated	HOME COMFORT	36
8	Baltimore Paints Consolidated	LE MODE	3
8	Baltimore Paints Consolidated	LONG HAUL	3
8	Baltimore Paints Consolidated	VALU-MATTE	1
13	Boykin Chemical Workshop	BUSTERS	1
13	Boykin Chemical Workshop	LE MODE	2
13	Boykin Chemical Workshop	LONG HAUL	2
13	Boykin Chemical Workshop	OLDE TYME QUALITY	2
13	Boykin Chemical Workshop	STUTTENFURST	1
13	Boykin Chemical Workshop	VALU-MATTE	1

44. Write a query to display the employee number, last name, first name, and sum of invoice totals for all employees who completed an invoice. Sort the output by employee last name and then by first name (Figure P7.44).

FIGURE P7.44 TOTAL VALUE OF INVOICES COMPLETED BY EACH EMPLOYEE

EMP_NUM	EMP_LNAME	EMP_FNAME	TOTALINVOICES
83665	ABERNATHY	LOURDES	19158.54
83792	ANDERSEN	WALLY	20627.47
83705	BARR	JOSE	22098.88
84049	BRANDON	LANE	20683.06
83936	BRAY	BRADFORD	21139.94
84248	CASTLE	DANICA	17700.42
84420	CAUDILL	DOUG	11308.21
83993	CORTES	SANG	17436.88
84021	DICKINSON	JAROD	20437.35
84163	EASLEY	GWEN	24813.26
83537	ENGLISH	CLEO	18883.13
84078	ERWIN	DIEGO	23839.85

45. Write a query to display the largest average product price of any brand (Figure P7.45).

FIGURE P7.45 LARGEST AVERAGE BRAND PRICE

LARGEST AVERAGE
22.59

46. Write a query to display the brand ID, brand name, brand type, and average price of products for the brand that has the largest average product price (Figure P7.46).

FIGURE P7.46 BRAND WITH THE HIGEST AVERAGE PRICE

BRAND_ID	BRAND_NAME	BRAND_TYPE	AVGPRICE
29	BUSTERS	VALUE	22.59

47. Write a query to display the manager name, department name, department phone number, employee name, customer name, invoice date, and invoice total for the department manager of the employee who made a sale to a customer whose last name is Hagan on May 18, 2015 (Figure P7.47).

FIGURE P7.47 MANAGER OF EMPLOYEE MAKING A SALE TO CUSTOMER HAGAN

Manager FName	Manager LName	DEPT_NAME	DEPT_PHONE	Employee Fname	Employee Lname	Customer FName	Customer LName	INV_DATE	INV_TOTAL
FRANKLYN	STOVER	SALES	555-2824	THURMAN	WILKINSON	DARELL	HAGAN	5/18/2015	316.04

48. Write a query to display the current salary for each employee in department 300. Assume that only current employees are kept in the system, and therefore the most current salary for each employee is the entry in the salary history with a NULL end date. Sort the output in descending order by salary amount (Figure P7.48).

FIGURE P7.48 CURRENT SALARY FOR EMPLOYEES IN DEPARTMENT 300

Emp_Num	Emp_LName	Emp_FName	Sal_Amount
83746	RANKIN	SEAN	96560
84328	CARPENTER	FERN	94090
83716	RIVERA	HENRY	86920
84432	JAMISON	MERLE	85360
83902	VARGAS	ROCKY	79540
83695	MENDEZ	CARROLL	79200
84500	WESTON	CHRISTINE	78690
84594	TIDWELL	ODELL	77400
83910	AVERY	LAUREN	76110
83359	WATTS	MERLE	72240
83790	ACEVEDO	LAVINA	72000

49. Write a query to display the starting salary for each employee. The starting salary would be the entry in the salary history with the oldest salary start date for each employee. Sort the output by employee number (Figure P7.49).

FIGURE P7.49 STARTING SALARY FOR EACH EMPLOYEE

Emp_Num	Emp_LName	Emp_FName	Sal_Amount
83304	MCDONALD	TAMARA	19770
83308	LOVE	CONNIE	11230
83312	BAKER	ROSALBA	39260
83314	DAVID	CHAROLETTE	15150
83318	PECK	DARCIE	22330
83321	FARMER	ANGELINA	18250
83332	LONG	WILLARD	23380
83341	CORTEZ	CHRISTINE	14510
83347	WINN	QUINTIN	17010
83349	SINGH	JENNIFFER	21220
83359	WATTS	MERLE	25370
83366	BLEDSOE	PHOEBE	23200

50. Write a query to display the invoice number, line numbers, product SKUs, product descriptions, and brand ID for sales of sealer and top coat products of the same brand on the same invoice. Sort the results by invoice number in ascending order, first line number in ascending order, and then by second line number in descending order (Figure P7.50).

FIGURE P7.50 INVOICES FOR SEALER AND TOP COAT OF THE SAME BRAND

Inv_Num	l.Line_Num	p.Prod_Sku	p.Prod_Descript	l2.Line_Num	p2.Prod_Sku	p2.Prod_Descript	Brand_ID
115	2	5140-RTG	Fire Resistant Sealer, for Exterior Wood (ULC Approved)	1	1203-AIS	Fire Retardant Coating, Latex, Interior, Flat (ULC Approved)	35
118	2	5140-RTG	Fire Resistant Sealer, for Exterior Wood (ULC Approved)	5	5046-TTC	Aluminum Paint, Heat Resistant (Up to 427°C - 800°F)	35
135	5	3036-PCT	Sealer, for Knots	2	1074-VVJ	Light Industrial Coating, Exterior, Water Based (eggshell-like' - MPI Gloss Level 3)	25
163	2	3701-YAW	Sealer, Solvent Based, for Concrete Floors	1	3955-NWD	Water Repellant, Clear (Not Paintable)	30
222	1	1336-FVM	Alkyd, Sanding Sealer, Clear	3	8199-YRF	Varnish, Exterior, Water Based, (Satin-Like) MPI Gloss Level 4	33
234	4	5728-ZPO	Shop Coat, Quick Dry, for Interior Steel	3	9272-LTP	Varnish, Marine Spar, Exterior, Gloss (MPI Gloss Level 6)	27
234	4	5728-ZPO	Shop Coat, Quick Dry, for Interior Steel	2	9126-PWF	Latex, Recycled (Consolidated), Interior (MPI Gloss Level 3)	27
243	1	4072-SWV	Sealer, Solvent Based, for Concrete Floors	3	5663-RTU	Aluminum Paint	23
267	1	8894-LUR	Lacquer, Sanding Sealer, Clear	5	9838-FUF	Fire Retardant Top-Coat, Clear, Alkyd, Interior (ULC Approved)	27
333	1	3701-YAW	Sealer, Solvent Based, for Concrete Floors	6	2584-CU	Stain, for Exterior Wood Decks	30
333	1	3701-YAW	Sealer, Solvent Based, for Concrete Floors	5	4784-SLU	Lacquer, Clear, Flat	30
369	2	1403-TUY	Sealer, Water Based, for Concrete Floors	1	6726-ZNM	Floor Paint, Alkyd, Low Gloss	29

51. The Binder Prime Company wants to recognize the employee who sold the most of its products during a specified period. Write a query to display the employee number, employee first name, employee last name, email address, and total units sold for the employee who sold the most Binder Prime brand products between November 1, 2015, and December 5, 2015. If there is a tie for most units sold, sort the output by employee last name (Figure P7.51).

FIGURE P7.49 STARTING SALARY FOR EACH EMPLOYEE

Emp_Num	Emp_FName	Emp_LName	Emp_Email	Total
84134	ROSALIE	GARLAND	G.ROSALI96@LGCOMPANY.COM	23
83850	RUSTY	MILES	M.RUSTY95@LGCOMPANY.COM	23

52. Write a query to display the customer code, first name, and last name of all customers who have had at least one invoice completed by employee 83649 and at least one invoice completed by employee 83677. Sort the output by customer last name and then first name (Figure P7.52).

FIGURE P7.52 CUSTOMERS WITH INVOICE FILLED BY EMPLOYEES 83649 AND 83677

Cust_Code	Cust_FName	Cust_LName
684	WENDI	BEAN
340	MARCIA	BURRIS
211	GERALD	CAUDILL
292	VALARIE	DILLARD
293	CLAIR	ERICKSON
416	TATIANA	HOWE
996	EZRA	LYON
98	VALENTIN	MARINO
121	PETER	SMALL
1157	LUCIO	STALEY
617	CESAR	TALLEY
457	SHAUNA	WERNER
131	SAL	WHALEY

53. LargeCo is planning a new promotion in Alabama (AL) and wants to know about the largest purchases made by customers in that state. Write a query to display the customer code, customer first name, last name, full address, invoice date, and invoice total of the largest purchase made by each customer in Alabama. Be certain to include any customers in Alabama who have never made a purchase; their invoice dates should be NULL and the invoice totals should display as 0. Sort the results by customer last name and then first name (Figure P7.53).

FIGURE P7.53 LARGEST PURCHASES OF CUSTOMERS IN AL

Cust_Code	Cust_FName	Cust_LName	Cust_Street	Cust_City	Cust_State	Cust_ZIP	Inv_Date	Largest Invoice
903	ROBIN	ADDISON	323 LORETTA PLACE	Mobile	AL	36693	8/26/2015	230.63
643	NINA	ALLEN	680 RED TALON DRIVE	Robertsdale	AL	36574	6/21/2015	11.99
295	DORTHY	AUSTIN	829 BIG BEND LOOP	Diamond Shamrock	AL	36614	4/24/2015	589.75
393	FOSTER	BERNAL	1299 EAST 3RD AVENUE	Birmingham	AL	35280		0
853	GAYLORD	BOLTON	1069 LUGENE LANE	Montgomery	AL	36131	11/25/2015	372.68
925	ALANA	BOOKER	1874 I STREET	Mccullough	AL	36502	12/12/2015	208.85
1248	LISA	BRADY	491 LOWLAND AVENUE	Daphne	AL	36577	12/5/2015	414.47
538	CHIQUITA	CALDWELL	1501 BRIGGS COURT	Normal	AL	35762	5/26/2015	143.9
89	MONICA	CANTRELL	697 ADAK CIRCLE	Loachapoka	AL	36865	3/31/2015	516.58
1233	NATHALIE	CHURCH	1802 SNOWY OWL CIRCLE	Napier Field	AL	36303	11/24/2015	160.96
304	GERTRUDE	CONNORS	1042 PLEASANT DRIVE	Georgiana	AL	36033	12/29/2015	376.32
1131	CARMA	CORNETT	767 CHISANA WAY	Killen	AL	35645	10/25/2015	265.12
1407	FELICIA	CRUZ	643 TURNAGAIN PARKWAY	Coalburg	AL	35068	1/6/2016	387.93

54. One of the purchasing managers is interested in the impact of product prices on the sale of products of each brand. Write a query to display the brand name, brand type, average price of products of each brand, and total units sold of products of each brand. Even if a product has been sold more than once, its price should only be included once in the calculation of the average price. However, you must be careful because multiple products of the same brand can have the same price, and each of those products must be included in the calculation of the brand's average price. Sort the result by brand name (Figure P7.54).

FIGURE P7.54 AVERAGE PRICE AND TOTAL UNITS SOLD OF PRODUCTS BY BRAND

Brand_Name	Brand_Type	Average Price	Units Sold
BINDER PRIME	PREMIUM	16.12	3753
BUSTERS	VALUE	22.59	3727
FORESTERS BEST	VALUE	20.94	2086
HOME COMFORT	CONTRACTOR	21.8	4842
LE MODE	PREMIUM	19.22	5284
LONG HAUL	CONTRACTOR	20.12	5728
OLDE TYME QUALITY	CONTRACTOR	18.33	3614
STUTTENFURST	CONTRACTOR	16.47	3671
VALU-MATTE	VALUE	16.84	2485

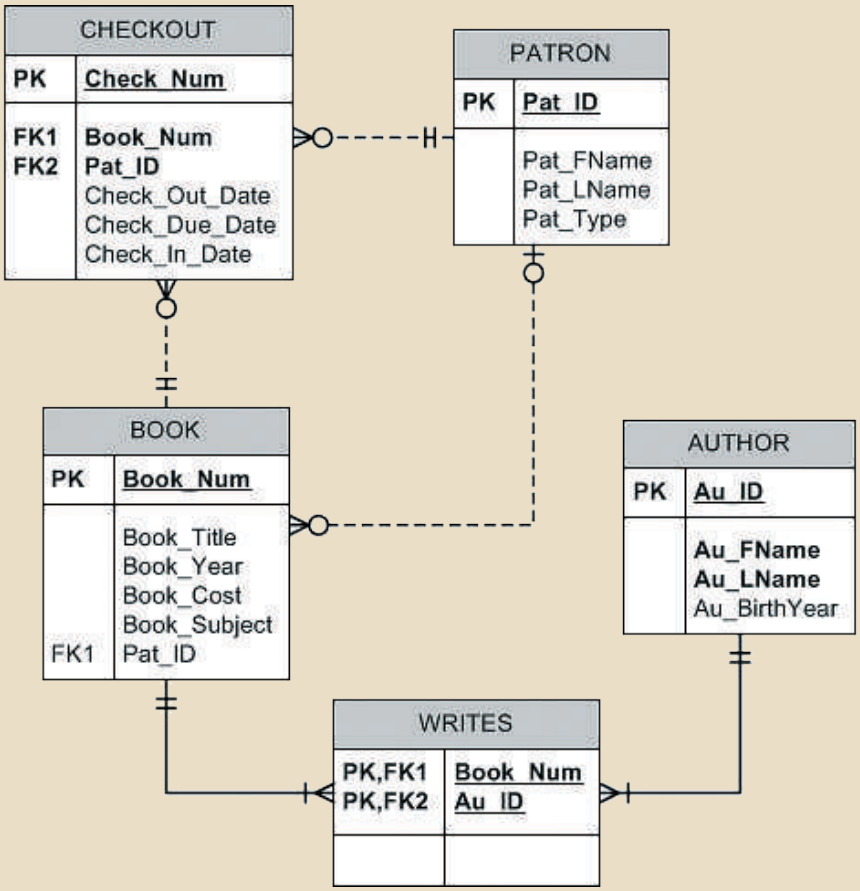
55. The purchasing manager is still concerned about the impact of price on sales. Write a query to display the brand name, brand type, product SKU, product description, and price of any products that are not a premium brand, but that cost more than the most expensive premium brand products (Figure P7.55).

FIGURE P7.55 NON-PREMIUM PRODUCTS THAT ARE MORE EXPENSIVE THAN PREMIUM PRODUCTS

Brand_Name	Brand_Type	Prod_Sku	Prod_Descript	Prod_Price
LONG HAUL	CONTRACTOR	1964-OUT	Fire Resistant Top Coat, for Interior Wood	78.49

The CIS Department at Tiny College maintains the Free Access to Current Technology (FACT) library of e-books. FACT is a collection of current technology e-books for use by faculty and students. Agreements with the publishers allow patrons to electronically check out a book, which gives them exclusive access to the book online through the FACT website, but only one patron at a time can have access to a book. A book must have at least one author but can have many. An author must have written at least one book to be included in the system but may have written many. A book may have never been checked out but can be checked out many times by the same patron or different patrons over time. Because all faculty and staff in the department are given accounts at the online library, a patron may have never checked out a book or they may have checked out many books over time. To simplify determining which patron currently has a given book checked out, a redundant relationship between BOOK and PATRON is maintained. The ERD for this system is shown in Figure P7.56 and should be used to answer the next several problems. For Problems 57–109, a figure of the correct output is provided for each problem. If the output of the query is very large, only the first several rows of the output are shown.

FIGURE P7.56 THE CH07_FACT ERD



56. Write a query that displays the book title, cost and year of publication for every book in the system. Sort the results by book title.

57. Write a query that displays the first and last name of every patron, sorted by last name and then first name. Ensure the sort is case insensitive (Figure P7.57). (50 rows)

FIGURE P7.57 ALL PATRON NAMES

PAT_FNAME	PAT_LNAME
Vera	Alvarado
Holly	Anthony
Cedric	Baldwin
Cory	Barry
Nadine	Blair
Erika	Bowen
Gerald	Burke
Ollie	Cantrell
robert	carter
Keith	Cooley

58. Write a query to display the checkout number, checkout date, and due date for every book that has been checked out sorted by checkout number (Figure P7.58). (68 rows)

FIGURE P7.58 ALL CHECKOUTS

CHECK_NUM	CHECK_OUT_DATE	CHECK_DUE_DATE
91001	3/31/2017	4/14/2017
91002	3/31/2017	4/7/2017
91003	3/31/2017	4/14/2017
91004	3/31/2017	4/14/2017
91005	3/31/2017	4/7/2017
91006	4/5/2017	4/12/2017
91007	4/5/2017	4/12/2017
91008	4/5/2017	4/12/2017
91009	4/5/2017	4/19/2017
91010	4/5/2017	4/19/2017
91011	4/5/2017	4/12/2017

59. Write a query to display the book number, book title, and subject for every book sorted by book number (Figure P7.59). (20 rows)

FIGURE P7.59 TITLE AND SUBJECT FOR ALL BOOKS

BOOK_NUM	TITLE	Subject of Book
5235	Beginner's Guide to JAVA	Programming
5236	Database in the Cloud	Cloud
5237	Mastering the database environment	Database
5238	Conceptual Programming	Programming
5239	J++ in Mobile Apps	Programming
5240	iOS Programming	Programming
5241	JAVA First Steps	Programming
5242	C# in Middleware Deployment	Middleware
5243	DATABASES in Theory	Database
5244	Cloud-based Mobile Applications	Cloud
5245	The Golden Road to Platform independence	Middleware

60. Write a query to display the different years in which books have been published. Include each year only once and sort the results by year (Figure P7.60).

FIGURE P7.60 UNIQUE BOOK YEARS

BOOK_YEAR
2014
2015
2016
2017

61. Write a query to display the different subjects on which FACT has books. Include each subject only once and sort the results by subject (Figure P7.61).

FIGURE P7.61 UNIQUE BOOK SUBJECTS

BOOK_SUBJECT
Cloud
Database
Middleware
Programming

62. Write a query to display the book number, title, and cost of each book sorted by book number (Figure P7.62).

FIGURE P7.62 TITLE AND REPLACEMENT COST FOR BOOKS

BOOK_NUM	BOOK_TITLE	Replacement Cost
5235	Beginner's Guide to JAVA	59.95
5236	Database in the Cloud	79.95
5237	Mastering the database environment	89.95
5238	Conceptual Programming	59.95
5239	J++ in Mobile Apps	49.95
5240	iOS Programming	79.95
5241	JAVA First Steps	49.95
5242	C# in Middleware Deployment	59.95
5243	DATABASES in Theory	129.95
5244	Cloud-based Mobile Applications	69.95
5245	The Golden Road to Platform independence	119.95
5246	Capture the Cloud	69.95
5247	Shining Through the Cloud: Sun Programming	109.95
5248	What You Always Wanted to Know About Database, But Were Afraid to Ask	49.95

63. Write a query to display the checkout number, book number, patron ID, checkout date, and due date for every checkout that has ever occurred in the system. Sort the results by checkout date in descending order and then by checkout number in ascending order (Figure P7.63). (68 rows)

FIGURE P7.63 CHECKOUTS BY DATE

CHECK_NUM	BOOK_NUM	PAT_ID	CHECK_OUT_DATE	CHECK_DUE_DATE
91067	5252	1229	5/24/2017	5/31/2017
91068	5238	1229	5/24/2017	5/31/2017
91066	5242	1228	5/19/2017	5/26/2017
91064	5236	1183	5/17/2017	5/31/2017
91065	5244	1210	5/17/2017	5/24/2017
91060	5235	1209	5/15/2017	5/22/2017
91061	5246	1172	5/15/2017	5/22/2017
91062	5254	1223	5/15/2017	5/22/2017
91063	5243	1223	5/15/2017	5/22/2017
91056	5254	1224	5/10/2017	5/17/2017

64. Write a query to display the book title, year, and subject for every book. Sort the results by book subject in ascending order, year in descending order, and then title in ascending order (Figure P7.64). (20 rows)

FIGURE P7.64 BOOKS BY CASCADING SORT

BOOK_TITLE	BOOK_YEAR	BOOK_SUBJECT
Capture the Cloud	2016	Cloud
Starlight Applications	2016	Cloud
Cloud-based Mobile Applications	2015	Cloud
Database in the Cloud	2014	Cloud
Beyond the Database Veil	2016	Database
What You Always Wanted to Know About Database, But Were Afraid to Ask	2016	Database
DATABASES in Theory	2015	Database
Mastering the database environment	2015	Database
Reengineering the Middle Tier	2016	Middleware
The Golden Road to Platform independence	2016	Middleware

65. Write a query to display the book number, title, and cost for all books that cost $59.95 sorted by book number (Figure P7.65).

FIGURE P7.65 BOOKS THAT COST $59.95

BOOK_NUM	BOOK_TITLE	BOOK_COST
5235	Beginner's Guide to JAVA	59.95
5238	Conceptual Programming	59.95
5242	C# in Middleware Deployment	59.95
5251	Thoughts on Revitalizing Ruby	59.95

66. Write a query to display the book number, title, and replacement cost for all books in the "Database" subject sorted by book number (Figure P7.66).

FIGURE P7.66 DATABASE BOOKS

BOOK_NUM	BOOK_TITLE	BOOK_COST
5237	Mastering the database environment	89.95
5243	DATABASES in Theory	129.95
5248	What You Always Wanted to Know About Database, But Were Afraid to Ask	49.95
5252	Beyond the Database Veil	69.95

67. Write a query to display the checkout number, book number, and checkout date of all books checked out before April 5, 2017 sorted by checkout number (Figure P7.67).

FIGURE P7.67 CHECKOUTS BEFORE APRIL 5TH

CHECK_NUM	BOOK_NUM	CHECK_OUT_DATE
91001	5235	3/31/2017
91002	5238	3/31/2017
91003	5240	3/31/2017
91004	5237	3/31/2017
91005	5236	3/31/2017

68. Write a query to display the book number, title, and year of all books published after 2015 and on the "Programming" subject sorted by book number (Figure P7.68).

FIGURE P7.68 NEWER BOOKS ON PROGRAMMING

BOOK_NUM	BOOK_TITLE	BOOK_YEAR
5247	Shining Through the Cloud: Sun Programming	2016
5251	Thoughts on Revitalizing Ruby	2016
5253	Virtual Programming for Virtual Environments	2016
5254	Coding Style for Maintenance	2017

69. Write a query to display the book number, title, subject, and cost for all books that are on the subjects of "Middleware" or "Cloud," and that cost more than $70 sorted by book number (Figure P7.69).

FIGURE P7.69 EXPENSIVE MIDDLEWARE OR CLOUD BOOKS

BOOK_NUM	BOOK_TITLE	BOOK_SUBJECT	BOOK_COST
5236	Database in the Cloud	Cloud	79.95
5245	The Golden Road to Platform independence	Middleware	119.95
5250	Reengineering the Middle Tier	Middleware	89.95

70. Write a query to display the author ID, first name, last name, and year of birth for all authors born in the decade of the 1980s sorted by author ID (Figure P7.70).

FIGURE P7.70 AUTHORS BORN IN THE 1980S

AU_ID	AU_FNAME	AU_LNAME	AU_BIRTHYEAR
218	Rachel	Beatney	1983
383	Neal	Walsh	1980
394	Robert	Lake	1982
438	Perry	Pearson	1986
460	Connie	Paulsen	1983
581	Manish	Aggerwal	1984
603	Julia	Palca	1988

71. Write a query to display the book number, title, and subject for all books that contain the word "Database" in the title, regardless of how it is capitalized. Sort the results by book number (Figure P7.71).

FIGURE P7.71 BOOK TITLES CONTAINING DATABASE

BOOK_NUM	BOOK_TITLE	BOOK_SUBJECT
5236	Database in the Cloud	Cloud
5237	Mastering the database environment	Database
5243	DATABASES in Theory	Database
5248	What You Always Wanted to Know About Database, But Were Afraid to Ask	Database
5252	Beyond the Database Veil	Database

72. Write a query to display the patron ID, first and last name of all patrons who are students, sorted by patron ID (Figure P7.72). (44 rows)

FIGURE P7.72 STUDENT PATRONS

PAT_ID	PAT_FNAME	PAT_LNAME
1166	Vera	Alvarado
1171	Peggy	Marsh
1172	Tony	Miles
1174	Betsy	Malone
1180	Nadine	Blair
1181	Allen	Horne
1182	Jamal	Melendez
1184	Jimmie	Love
1185	Sandra	Yang
1200	Lorenzo	Torres

73. Write a query to display the patron ID, first and last name, and patron type for all patrons whose last name begins with the letter "C," sorted by patron ID (Figure P7.73).

FIGURE P7.73 PATRONS WHOSE LAST NAME STARTS WITH "C"

PAT_ID	PAT_FNAME	PAT_LNAME	PAT_TYPE
1160	robert	carter	Faculty
1208	Ollie	Cantrell	Student
1210	Keith	Cooley	STUdent

74. Write a query to display the author ID, first and last name of all authors whose year of birth is unknown. Sort the results by author ID (Figure P7.74).

FIGURE P7.74 AUTHORS WITH UNKNOWN BIRTH YEAR

AU_ID	AU_FNAME	AU_LNAME
229	Carmine	Salvadore
262	Xia	Chiang
559	Rachel	McGill

75. Write a query to display the author ID, first and last name of all authors whose year of birth is known. Ensure the results are sorted by author ID (Figure P7.75).

FIGURE P7.75 AUTHORS WITH KNOWN BIRTH YEAR

AU_ID	AU_FNAME	AU_LNAME
185	Benson	Reeves
218	Rachel	Beatney
251	Hugo	Bruer
273	Reba	Durante
284	Trina	Tankersly
383	Neal	Walsh
394	Robert	Lake
438	Perry	Pearson
460	Connie	Paulsen
581	Manish	Aggerwal
592	Lawrence	Sheel
603	Julia	Palca

76. Write a query to display the checkout number, book number, patron ID, checkout date, and due date for all checkouts that have not yet been returned. Sort the results by book number (Figure P7.76).

FIGURE P7.76 UNRETURNED CHECKOUTS

CHECK_NUM	BOOK_NUM	PAT_ID	CHECK_OUT_DATE	CHECK_DUE_DATE
91068	5238	1229	5/24/2017	5/31/2017
91053	5240	1212	5/9/2017	5/16/2017
91066	5242	1228	5/19/2017	5/26/2017
91061	5246	1172	5/15/2017	5/22/2017
91059	5249	1207	5/10/2017	5/17/2017
91067	5252	1229	5/24/2017	5/31/2017

77. Write a query to display the author ID, first name, last name, and year of birth for all authors. Sort the results in descending order by year of birth, and then in ascending order by last name (Figure P7.77). (*Note:* Some DBMS sort NULLs as being large and some DBMS sort NULLs as being small.)

FIGURE P7.77 AUTHORS BY BIRTH YEAR

AU_ID	AU_FNAME	AU_LNAME	AU_BIRTHYEAR
185	Benson	Reeves	1990
603	Julia	Palca	1988
438	Perry	Pearson	1986
581	Manish	Aggerwal	1984
218	Rachel	Beatney	1983
460	Connie	Paulsen	1983
394	Robert	Lake	1982
383	Neal	Walsh	1980
592	Lawrence	Sheel	1976
251	Hugo	Bruer	1972
273	Reba	Durante	1969
284	Trina	Tankersly	1961
262	Xia	Chiang	
559	Rachel	McGill	
229	Carmine	Salvadore	

78. Write a query to display the number of books in the FACT system (Figure P7.78).

FIGURE P7.78 NUMBER OF BOOKS

Number of Books
20

79. Write a query to display the number of different book subjects in the FACT system (Figure P7.79).

FIGURE P7.79 NUMBER OF DIFFERENT SUBJECTS

Number of Subjects
4

80. Write a query to display the number of books that are available (not currently checked out) (Figure P7.80).

FIGURE P7.80 NUMBER OF BOOKS NOT CURRENTLY CHECKED OUT

Available Books
14

81. Write a query to display the highest book cost in the system (Figure P7.81).

FIGURE P7.81 MOST EXPENSIVE BOOK PRICE

Most Expensive
129.95

82. Write a query to display the lowest book cost in the system (Figure P7.82).

FIGURE P7.82 LEAST EXPENSIVE BOOK PRICE

Least Expensive
49.95

83. Write a query to display the number of different patrons who have ever checked out a book (Figure P7.83).

FIGURE P7.83 DIFFERENT PARTONS TO CHECKOUT A BOOK

DIFFERENT PATRONS
33