**ISS4014 – Database Systems and Web Integration**

**Chapter 07 – Activities and Homework**

Name: Logan Strong

Date: February 22nd, 2024

**Chapter 07 PROBLEMS (30 points – 1 point per problem)**

**Important Notes:**

1. **Problems that are in bold are suggested to be used for in-class activities and group work** as these problems present a higher level of challenge.
2. For each problem,
   1. Create a **NEW SQL SCRIPT TAB**
   2. **SAVE the script tab by naming it**: [your name] Problem [problem#]. For example: Justin Problem 1
   3. **Clear the OUTPUT at the bottom**.
3. After developing the correct SQL statement to properly solve the problem statement, get a screenshot that contains ALL of the following and paste it below the problem:

|  |  |
| --- | --- |
| * TAB NAME * SQL statements * RESULT GRID * OUTPUT AREA   The screenshot at the right shows an example of what you should copy & paste |  |

WARNING: Be sure to save each query tab as you work through the homework and do not have more than 10-12 tabs open at a time, or the Workbench program might crash, and any unsaved work will be lost.

|  |
| --- |
| Create a *ch07\_constructco* database/schema in MySQL Workbench and select the database.  Open and run the Ch07\_ConstructCo\_MySQL.sql script from the Student Files.  Use the *ch07\_constructco* database/schema for problems 1-8. |

A diagram of a project

Description automatically generated

**Ch07\_ConstructCo ERD**

**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.

A screenshot of a computer

Description automatically generated

**2.** Using the EMPLOYEE, JOB, and PROJECT tables in the Ch07\_ConstructCo data-base, write the SQL code that will join the EMPLOYEE and PROJECT tables using EMP\_NUM as the common attribute. The resulting table should list each project name, project value, project balance, the project lead employee (last name, first name and middle initial), and the employee’s job information (job code, job description, and job charge hour). The result should be sorted by project value.

A screenshot of a computer

Description automatically generated

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.

A screenshot of a computer

Description automatically generated

4. Write the SQL code that will list only the distinct project numbers in the ASSIGNMENT table, sorted by project number.

A screenshot of a computer

Description automatically generated

**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.

A screenshot of a computer

Description automatically generated

**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. List the employee number, employee last name, the sum of hours and the sum of charges.

A screenshot of a computer

Description automatically generated

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. List the project number, sum of hours and sum of charges.

A screenshot of a computer

Description automatically generated

8. Write the SQL code to generate the total hours worked and the total charges made by all employees.

A screenshot of a computer

Description automatically generated

|  |
| --- |
| Create a *ch07\_saleco* database/schema in MySQL Workbench and select the database.  Open and run the Ch07\_SaleCo\_MySQL.sql script from the Student Files.  Use the *ch07\_saleco* database/schema for problems 9-19. |

A diagram of a company

Description automatically generated with medium confidence

**Ch07\_SaleCo ERD**

9. Write a query to count the number of invoices.

A screenshot of a computer

Description automatically generated

10. Write a query to count the number of customers with a balance of more than $500.

A screenshot of a computer

Description automatically generated

11. Generate a listing of all purchases made by the customers, listing the customer code number, invoice number, invoice date, product description, line units and line price. Sort the results by customer code, invoice number, and product description.

A screenshot of a computer

Description automatically generated

**12.** Generate a listing of all customer purchases, listing the customer code number, invoice number, product description, line units labeled as “Units Bought”, line price labeled as “Unit Price” and the “Subtotal” 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 described.

A screenshot of a computer

Description automatically generated

**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 label subtotals as “Total Purchases”.

A screenshot of a computer

Description automatically generated

**14.**  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. List the sum of the invoices “Total Invoices”, sum of sales as “Total Sales”, smallest purchase as “Smallest Customer Purchases”, largest purchase as “Largest Customer Purchase”, and the Average as “Average Customer Purchase”. Use the FORMAT function to format all currency values to two decimal places. (Hint: use the appropriate in class problem on Slide 59 of the PowerPoint as sub select in the FROM clause).

A screenshot of a computer

Description automatically generated

**15.** 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. List the customer code and customer balance, sorted by customer code. List each customer only once.

A screenshot of a computer

Description automatically generated

16. Provide a summary of customer balance characteristics for customers who made purchases from Problem 15. Include the minimum balance, maximum balance, and average balance each labeled properly. Format results to two decimal places. (NOTE: Include each customer only once when calculating the average balance).

A screenshot of a computer

Description automatically generated

17. Create a query to find the balance characteristics for all customers, including the total of the outstanding balances. List the total balance, minimum balance, maximum balance and the averaged balance each labeled properly. Format the average to two decimal places.

A screenshot of a computer

Description automatically generated

18. Find the listing of customers who did not make purchases during the invoicing period. List the customer code and the customer balance. Sort the results by customer code.

A screenshot of a computer

Description automatically generated

19. Find the customer balance summary for all customers who have not made purchases during the current invoicing period. List the total balance, minimum balance, maximum balance and the average balance (formatted to two decimal places). Label each column properly.

A screenshot of a computer

Description automatically generated

|  |
| --- |
| Create a *ch07\_largeco* database/schema in MySQL Workbench and select the database.  Open and run the Ch07\_LargeCo\_MySQL.sql script from the Student Files.  Use the *ch07\_largeco* database/schema for problems 20-27. |

A screenshot of a computer

Description automatically generated

**Ch07\_SaleCo ERD**

20. Write a query to display all attributes of the eight departments in the LGDEPARTMENT table sorted by department name.

A screenshot of a computer

Description automatically generated

**21.** 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

A screenshot of a computer

Description automatically generated

22. 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.

A screenshot of a computer

Description automatically generated

**23.** Write a query to display the largest average product price (formatted to two decimal places) of any brand. Label the header “Largest Average”.

A screenshot of a computer

Description automatically generated

**24.** Write a query to list the brand ID, brand name, brand type, and average price of products (formatted to two decimal places) for the brand that has the largest average product price.

A screenshot of a computer

Description automatically generated

25. Write a query to list the employee number, employee last name, employee first name, and 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.

A screenshot of a computer

Description automatically generated

**26.** Write a query to list the invoice number, line numbers, product SKUs, product descriptions (the line number, SKU and description for each SKU), 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.

A screenshot of a computer

Description automatically generated

**27.** The Binder Prime Company wants to recognize the employee who sold the most of its products during a specified period. Write a query to list 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, 2017, and December 5, 2017. If there is a tie for most units sold, sort the output by employee last name.

A screenshot of a computer

Description automatically generated

|  |
| --- |
| Create a *ch07\_fact* database/schema in MySQL Workbench and select the database.  Open and run the Ch07\_Fact\_MySQL.sql script from the Student Files.  Use the *ch07\_fact* database/schema for problems 28-31. |

A computer screen shot of a computer

Description automatically generated

**Ch07\_Fact ERD**

28. Write a query to display the author ID and the number of books written (labeled as “Books Written”) by that author. Sort the results in descending order by number of books, then in ascending order by author ID.

A screenshot of a computer

Description automatically generated

**29.** Write a query to display the book number, title, and number of times each book has been checked out (labeled as “Times Checked Out”). Include books that have never been checked out. Sort the results in descending order by the number of times checked out and then by title.

A screenshot of a computer

Description automatically generated

**30.** Write a query to display the book number, title, and number of times each book has been checked out. Limit the results to books that have been checked out more than five times. Sort the results in descending order by the number of times checked out and then by title.

A screenshot of a computer

Description automatically generated