Homework#3

CS364 Introduction to Database Systems, Spring 2017

Due: April 7 (Friday)

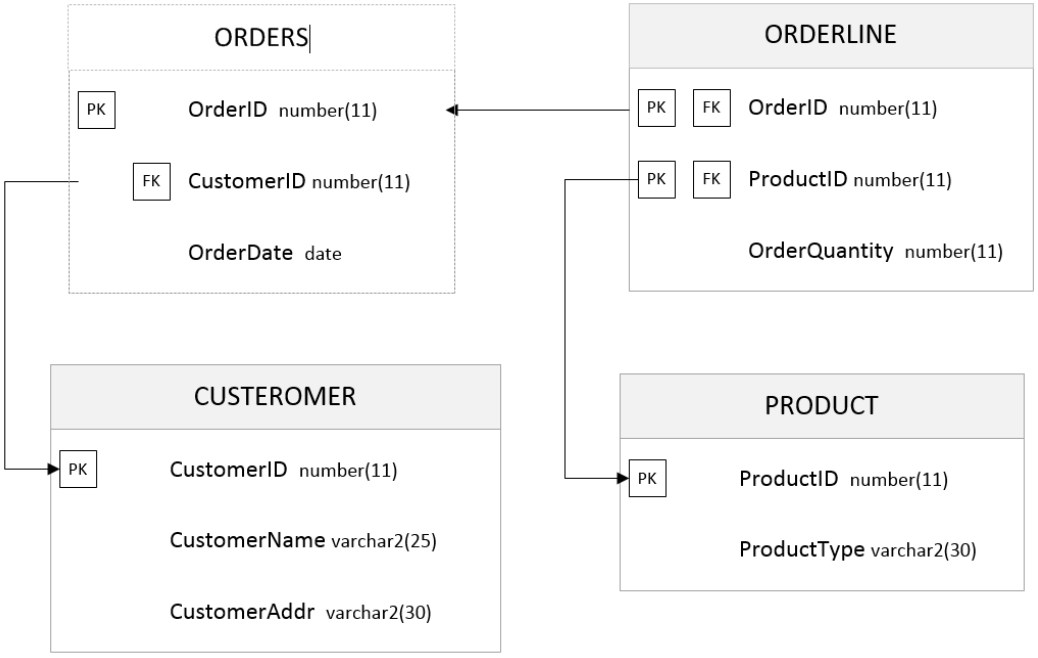
NOTE

- **Make ONE file** (CS364_YourLasttName_YourFirstName_HW3.doc (.pdf)) for your homework.
- **For SQL answers, you have to include the execution result of your SQL statement.** For example, a screen shot which shows the output of each SQL statement would be fine.
- Submit it through the Blackboard course webpage.

Part I (40 points). Relation creation and data management

For SQL questions, include the execution result of your SQL statement.

1. (12 points) Write SQLs to create three tables based on given relational schemas and directions below.



In addition of the relational schema above, include the following specifications in the table creation.

(1) The OrderDate column of ORDERS table has a default value as a current system date, SYSDATE.

(2) The value of OrderQuantity of ORDERINE table should be greater than 0.

(3) The value of ProductType of PRODUCT table should be a value in this list {'Books','Electronics', 'Home', 'Clothing'}

(4) When an order record in ORDERS table is deleted, all ORDERINE records associated with the OrderID of the deleted record are also deleted.

(5) ~~When the OrderID value of an ORDERS record is changed, its associated OrderID value in ORDERLINE table is automatically changed with the changed value.~~

NOTE: Oracle does not support "update cascade", this condition is removed.

(6) When a CUSTOMER record is deleted, its associated ORDERS records' CustomerID is changed to NULL.

2. (6 points) Write SQL statements to insert following records into corresponding tables.

CUSTOMER table
< 1, 'James Park', '1355 S Hines Blvd'>
< 2, 'Tom Hoffer', '15145 S.W. 17th St.' >

PRODUCT table
<711, 'Electronics'>
<721, 'Books' >
<722, 'Books' >

ORDERS table
<1001, 1, '10/28/2016 18:00' >
<1002, 2 >

(NOTE) The default date format in Oracle is 'dd-mon-yy'. The tuple does not follow the default date format. So you need to convert the date value using a date conversion function.
For example, to change '01/28/2017 18:00' to the default date format, use
TO_DATE('01/28/201718:00', 'mm/dd/yyyy hh24:mi').

ORDERLINE table
<1001, 711, 1 >
<1001, 721, 1 >
<1002, 722, 3 >

2. (2 points) Run a SQL query statement below and check the order date of order number 1002.

SELECT * FROM ORDERS:

3. (4 points) Write SQL statements for followings (1) – (3):

(1) Change the order quantity of product 711 in order id 1001 with 0.

(HINT) … WHERE OrderID =1001 and ProductID=711;

If you have an error for this change, explain the reason.

(2) Drop the constraint posed in OrderQuantity column.

(3) Again, change the order quantity of product 711 in order id 1001 with 0.

4. (4 points) Write SQL statements for followings (1)-(4) and answer for (5).

(1) Query all records from ORDERS table.

(HINT) SELECT * FROM ORDERS;

(2) Query all records from ORDERLINE table.

(HINT) SELECT * FROM ORDERLINE;

(3) Update the orderID of an order 1002 record in ORDERS table to 7772.

(HINT) …. WHERE OrderID=1002;

(4) Query ORDERS and ORDERLINE tables again.

(5) Explain the different of query results between (1) (2) and (4).

4. (4 points) Write SQL statements for followings (1)-(4) and answer for (5).

(1) Query all records from ORDERS table.

(2) Query all records from ORDERLINE table.

(3) Delete an order 1001 record from ORDERS table.

(HINT) …. WHERE OrderID=1001;

(4) Query ORDERS and ORDERLINE tables again.

(5) Explain the different of query results between (1) (2) and (4).

5. (4 points) Write SQL statements for followings:

(1) Increase the length of CustomerAddr column in CUSTOMER table to 50 (to hold maximum 50 characters).

(2) Add a new column, ProductPrice, of number type to PRODUCT table.

6. **(4 points)** Write SQL statements to remove (drop) all four tables : ORDERS, ORDERLINE, CUSTOMER, and PRODUCT.

(NOTE) The dropping order is important.

Part II (60 points) SQL Query

Setup

- Download **hw3_PartII_schema_data.sql** to your working directory and review the script file.
- Run the script file in your database account.

Write the SQL statement for following questions and show the execution result.

Selection and Projection

1. **(2 points)** List the customer (CustomerID and CustomerName) whose name begins with "C".

2. (4 points) List the first names of all employees.

(**NOTE**: Change the output heading of first name to "First Name" as shown below)

```
First Name
-------------------------
Jim
Robert
```

(**HINT**: You may need substr() and instr() functions to exact only first name.)

3. (3 points) List customers (CustomerID and CustomerName) who live in California orWashington, ordered by descending zip code:

4. (4 points) List employees who were hired in 1999 as shown below.

```
EMPLOYEENAME     Employee Hired Date
-------------------------   ---------------------------
Jim Jason                   Jun 12, 1999
   …                            …
```

(**NOTE**: a. Use BETWEEN operator for the range of 01/01/1999 and 12/31/1999 .
b. Change the displayed EmployeeDateHired to 'Mon dd, yyyy'.
c. Change the output heading of EmployeeDateHired to "Employee Hired Date") .

Summarization, Aggregation

5. **(4 points)** List the number of orders placed per customer as shown below.

CUSTOMERID	Total Number Of Orders
…	…

6. (5 points) For every product that has been ordered, display the product number and the total quantity ordered. List the most popular product first and the least popular last.

PRODUCTID	Total Ordered Quantity
…	…

7. (4 points) In the result of Q6, add another column 'Popularity' whose value is derived from the total ordered quantity using the following rule:

If Total Ordered Quantity > 10 then display 'Best';
elseif Total Ordered Quantity > 4 then display 'Good';
else display 'Bad'

PRODUCTID	Total Ordered Quantity	Popularity
…	…	..

(Note: One block SQL query statement would be enough. Use decode () function, sign () function or any available technique, e.g., when)

8. (4 points) List orders which has more than one product item as shown below.

ORDERID	Number of Products
…	…

Join I

9. (5 points) Display the customer number, customer name, and order number for all customer orders.

10. **(5 points)** Display order information made by CustomerID 4. The list includes order number, customer number, order date, product number, product description, and ordered quantity. (Note: Use one block query. No nested query)

ORDERID	CUSTOMERID	ORDERDATE	PRODUCTID	PRODUCTDESCRIPTION	ORDEREDQUANTITY
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Join II (Outer join)

11. (5 points) Display the customer number, name, and order number for all customer orders. For those customers who do not have any orders, include them in the display once. Display the results in order by customer number.

Join III (Self join)

12. (5 points) List employee name and his/her supervisor name (label this value Supervisor).

Nested queries

13. (5 points) Display the customer number and customer name who do not have any orders.
(**NOTE**: Use a nested query structure.)

Queries using set operators

14. (5 points) Customer names of customers who have ordered (on same or different orders) BOTH products 3 (ProductID=3) and 4 (ProductID=4). (**HINT**: A set operator is needed.)