Lab 01 – Relational Model

# **Objectives:**

The purpose of the first lab of TM210 is to familiarize yourself with the User Interface, SQL Developer, and the database that we will be using throughout the course to communicate with the Oracle server. By the end of this lab you should be able to:

* Successfully establish a connection with and login to the Oracle database server using SQL Developer
* Explore and work with the database and data
* Understand the relationships, constraints, data types, and tables’ specification.

# **Preface:**

If you have not already done so, you will need to download the sample database creation script from blackboard and run it. These instructions are included in the Getting Started section with SQL Developer document.

# **LAB 01 - SUBMISSION**

Answer the following questions in the provided space. **Save your file as a PDF file and name it as following**:

**DBS211\_L01\_LastName.sql.**

**Tasks:**

By navigating through SQL Developer and looking at the Columns, Data, model, and Constraints tabs for the given tables. You will answer the following questions.

**NOTE:** **In Question (a), some questions are answered as examples. You need to complete the rest. Add more rows to the tables in the document if you need more space for an answer. Use a different color for your answers.**

For the given tables in your database, answer the following questions:

# **Part A**

See the sample question:

1. Answer the following Question for the **DBS211\_PRODUCTS** table.
2. How many columns (attributes) are there in this table? \_\_\_\_\_\_9\_\_\_\_\_\_\_\_
3. How many rows are there in this table? \_\_\_\_\_\_\_\_\_110\_\_\_\_\_\_\_\_
4. List the table’s columns and the requested information in the following format:

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Type** | **Not Null** |
| PRODUCTCODE | VARCHAR2(15 BYTE) | No |
| PRODUCTNAME | VARCHAR2(70 BYTE) | No |
| PRODUCTLINE | VARCHAR2(50 BYTE) | No |
| DBS211\_PRODUCTSCALE | VARCHAR2(10 BYTE) | No |
| PRODUCTVENDOR | VARCHAR2(50 BYTE) | No |
| PRODUCTDESCRIPTION | VARCHAR2(1000 BYTE) | No |
| QUANTITYINSTOCK | NUMBER(38,0) | No |
| BUYPRICE | NUMBER(10,2) | No |
| MSRP | NUMBER(10,2) | No |

1. Sort the data based on the third column in your table and write the data of the first row in the following format. To sort the data based on a column, right click on that column and select “sort”. You can select the column that the data will be sorted based on it. (Make sure CHATACTER type values are enclosed in single quotes.)

|  |  |
| --- | --- |
| Column name | Column Value |
| CUSTOMERNUMBER | 363 |
| CHECKNUMBER | ‘IS232033’ |
| PAYMENTDATE | 16-JAN-03 |
| AMOUNT | 10223.83 |

1. List all constraints in this table.

If a constraint is a foreign key, write the reference table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Constraint Name** | **Constraint Type** | **Constraint on**  **Column** | **Constraint Condition** | **Reference Table** |
| DBS211\_PAYMENTS\_CUSTNUM\_FK | Foreign\_Key | CUSTOMER\_ID |  | DBS211\_CUSTOMERS |
| SYS\_C001034315 | Check |  | "CUSTOMERNUMBER" IS NOT NULL |  |
| SYS\_C001034316 | Check |  | "CHECKNUMBER" IS NOT NULL |  |
| SYS\_C001034317 | Check |  | "PAYMENTDATE" IS NOT NULL |  |
| SYS\_C001034318 | Check |  | "AMOUNT" IS NOT NULL |  |
| SYS\_C001034319 | Primary\_Key |  |  |  |

1. What tables are in relationship with this table? List them below.

|  |  |
| --- | --- |
| **Table Name** | **Column in Common** |
| DBS211\_CUSTOMERS | CUSTOMER ID |

1. What is the model for this table relationships?

NOTE: means MANY

means ONE

MANY () is close to Contacts. You read “many Contacts”.

ONE () is close to customers. You read “one customer”.

|  |
| --- |
|  |

1. Translate the relationships in Question 7 (model) to English.

|  |
| --- |
| A customer have many payments.  A payment refers to one customer. |

1. Answer the following Question for the **DBS211\_CUSTOMERS** table.
2. How many columns (attributes) are there in this table? \_\_\_\_\_\_\_13\_\_\_\_\_\_\_
3. How many rows are there in this table? \_\_\_\_\_\_\_122\_\_\_\_\_\_\_\_\_\_
4. List the table’s columns and the requested information in the following format:

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Type** | **Not Null** |
| CUSTOMERNUMBER | NUMBER(38,0) | No |
| CUSTOMERNAME | VARCHAR2(50 BYTE) | No |
| CONTACTLASTNAME | VARCHAR2(50 BYTE) | No |
| CONTACTFIRSTNAME | VARCHAR2(50 BYTE) | No |
| PHONE | VARCHAR2(50 BYTE) | No |
| ADDRESSLINE1 | VARCHAR2(50 BYTE) | No |
| ADDRESSLINE2 | VARCHAR2(50 BYTE) | Yes |
| CITY | VARCHAR2(50 BYTE) | No |
| STATE | VARCHAR2(50 BYTE) | Yes |
| POSTALCODE | VARCHAR2(15 BYTE) | Yes |
| COUNTRY | VARCHAR2(50 BYTE) | No |
| SALESREPEMPLOYEENUMBER | NUMBER(38,0) | Yes |
| CREDITLIMIT | NUMBER(10,2) | Yes |

1. Sort the data based on the third column in your table and write the data of the first row in the following format: (Make sure **CHATACTER** type values are enclosed in ‘single quotes’.)

|  |  |
| --- | --- |
| **Column Name** | **Column Value** |
| CUSTOMERNUMBER | 249 |
| CUSTOMERNAME | ‘Amica Models "&" Co.’ |
| CONTACTLASTNAME | ‘Accorti’ |
| CONTACTFIRSTNAME | ‘Paolo’ |
| PHONE | ‘011-4988555’ |
| ADDRESSLINE1 | ‘Via Monte Bianco 34’ |
| ADDRESSLINE2 | ‘null’ |
| CITY | ‘Torino’ |
| STATE | ‘null’ |
| POSTALCODE | ‘10100’ |
| COUNTRY | 113000 |
| SALESREPEMPLOYEENUMBER | 1401 |

1. List all constraints in this table.

If a constraint is a foreign key, write the reference table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Constraint Name** | **Constraint Type** | **Constraint on**  **Column** | **Constraint Condition** | **Reference Table** |
| CUST\_SALESREP\_FK | Foreign\_Key | CUSTOMER\_NUMBER |  | DBS211\_EMPLOYEES |
| SYS\_C003545109 | Check |  | "CUSTOMERNUMBER" IS NOT NULL |  |
| SYS\_C003545110 | Check |  | "CUSTOMERNAME" IS NOT NULL |  |
| SYS\_C003545111 | Check |  | "CONTACTLASTNAME" IS NOT NULL |  |
| SYS\_C003545112 | Check |  | "CONTACTFIRSTNAME" IS NOT NULL |  |
| SYS\_C003545113 | Check |  | "PHONE" IS NOT NULL |  |
| SYS\_C003545114 | Check |  | "ADDRESSLINE1" IS NOT NULL |  |
| SYS\_C003545115 | Check |  | "CITY" IS NOT NULL |  |
| SYS\_C003545116 | Check |  | "COUNTRY" IS NOT NULL |  |
| SYS\_C003545117 | Primary\_Key |  |  |  |

1. What tables are in relationship with this table? List them below.

|  |  |
| --- | --- |
| **Table Name** | **Column in Common** |
| DBS211\_ORDERS | CUSTOMERNUMBER |
| DBS211\_PAYMENTS | CUSTOMERNUMBER |
| DBS211\_EMPLOYEES | EMPLOYEENUMBER |

1. What is the model for this table relationships?

NOTE: means MANY

means ONE

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| A diagram of a data flow  Description automatically generated |

1. Translate all the relationships in Question 7 (model) to English.

|  |
| --- |
| A customer has many orders.  Orders refer to one customer.  A customer has many payments.  Payments refer to one customer.  Many customers rely on many employees and vice versa. |

1. Answer the following Question for the **DBS211\_EMPLOYEES** table.
2. How many columns (attributes) are there in this table? \_\_\_\_\_\_8\_\_\_\_\_\_\_\_
3. How many rows are there in this table? \_\_\_\_\_\_\_23\_\_\_\_\_\_\_\_\_\_
4. List the table’s columns and the requested information in the following format:

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Type** | **Not Null** |
| EMPLOYEENUMBER | NUMBER(38,0) | No |
| LASTNAME | VARCHAR2(50 BYTE) | No |
| FIRSTNAME | VARCHAR2(50 BYTE) | No |
| EXTENSION | VARCHAR2(10 BYTE) | No |
| EMAIL | VARCHAR2(100 BYTE) | No |
| OFFICECODE | VARCHAR2(10 BYTE) | No |
| REPORTSTO | NUMBER(38,0) | Yes |
| JOBTITLE | VARCHAR2(50 BYTE) | No |

1. Sort the data based on the third column in your table and write the data of the first row in the following format: (Make sure **CHATACTER** type values are enclosed in single quotes.)

|  |  |
| --- | --- |
| **Column Name** | **Column Value** |
| EMPLOYEENUMBER | 1611 |
| LASTNAME | ‘Fixter’ |
| FIRSTNAME | ‘Andy’ |
| EXTENSION | ‘x101’ |
| EMAIL | ‘afixter@classicmodelcars.com’ |
| OFFICECODE | ‘6’ |
| REPORTSTO | 1088 |
| JOBTITLE | ‘Sales Rep’ |

1. List all constraints in this table.

If a constraint is a foreign key, write the reference table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Constraint Name** | **Constraint Type** | **Constraint on**  **Column** | **Constraint Condition** | **Reference Table** |
| EMP\_OFFICE\_FK | Foreign\_Key | OFFICECODE |  | DBS211\_OFFICES |
| EMP\_RTEMP\_FK | Foreign\_Key | EMPLOYEENUMBER |  | DBS211\_EMPLOYEES |
| SYS\_C003545099 | Check |  | "EMPLOYEENUMBER" IS NOT NULL |  |
| SYS\_C003545100 | Check |  | "LASTNAME" IS NOT NULL |  |
| SYS\_C003545101 | Check |  | "FIRSTNAME" IS NOT NULL |  |
| SYS\_C003545102 | Check |  | "EXTENSION" IS NOT NULL |  |
| SYS\_C003545103 | Check |  | "EMAIL" IS NOT NULL |  |
| SYS\_C003545104 | Check |  | "OFFICECODE" IS NOT NULL |  |
| SYS\_C003545105 | Check |  | "JOBTITLE" IS NOT NULL |  |
| SYS\_C003545106 | Primary\_Key |  |  |  |

1. What tables are in relationship with this table? List them below.

|  |  |
| --- | --- |
| **Table Name** | **Column in Common** |
| DBS211\_CUSTOMERS |  |
| DBS211\_OFFICES | OFFICECODE |

1. What is the model for this table relationships?

NOTE: means MANY

means ONE

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| A screenshot of a computer  Description automatically generated |

1. Translate all the relationships in Question 7 (model) to English.

|  |
| --- |
| An Office has many employees.  Employees refer to one office.  Many Employees have many customers and vice versa. |

1. Answer the following Question for the **DBS211\_ORDERS** table.
2. How many columns (attributes) are there in this table? \_\_\_\_\_\_\_7\_\_\_\_\_\_\_
3. How many rows are there in this table? \_\_\_\_\_\_\_\_326\_\_\_\_\_\_\_\_\_
4. List the table’s columns and the requested information in the following format:

|  |  |  |
| --- | --- | --- |
| **Column Name** | **Type** | **Not Null** |
| ORDERNUMBER | NUMBER(38,0) | No |
| ORDERDATE | DATE | No |
| REQUIREDDATE | DATE | No |
| SHIPPEDDATE | DATE | Yes |
| STATUS | VARCHAR2(15 BYTE) | No |
| COMMENTS | VARCHAR2(500 BYTE) | Yes |
| CUSTOMERNUMBER | NUMBER(38,0) | No |

1. Sort the data based on the third column in your table and write the data of the first row in the following format: (Make sure **CHATACTER** type values are enclosed in single quotes.)

|  |  |
| --- | --- |
| **Column Name** | **Column Value** |
| ORDERNUMBER | 10100 |
| ORDERDATE | 03-JAN-06 |
| REQUIREDDATE | 03-JAN-13 |
| SHIPPEDDATE | 03-JAN-10 |
| STATUS | ‘Shipped’ |
| COMMENTS | ‘null’ |
| CUSTOMERNUMBER | 363 |

1. List all constraints in this table.

If a constraint is a foreign key, write the reference table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Constraint Name** | **Constraint Type** | **Constraint on**  **Column** | **Constraint Condition** | **Reference Table** |
| DBS211\_ORDERS\_CUST\_FK | Foreign\_Key | CUSTOMERNUMBER |  | DBS211\_CUSTOMERS |
| SYS\_C003545132 | Check |  | "ORDERNUMBER" IS NOT NULL |  |
| SYS\_C003545133 | Check |  | "ORDERDATE" IS NOT NULL |  |
| SYS\_C003545134 | Check |  | "REQUIREDDATE" IS NOT NULL |  |
| SYS\_C003545135 | Check |  | "STATUS" IS NOT NULL |  |
| SYS\_C003545136 | Check |  | "CUSTOMERNUMBER" IS NOT NULL |  |
| SYS\_C003545137 | Primary\_Key |  |  |  |

1. What tables are in relationship with this table? List them below.

|  |  |  |
| --- | --- | --- |
| **Table Name** | **Column in Common** | **Refers to** |
| DBS211\_ORDERDETAILS | ORDERNUMBER | DBS211\_ORDERS |
| DBS211\_CUSTOMERS | CUSTOMERNUMBER | DBS211\_ORDERS |

1. What is the model for this table relationships?

NOTE: means MANY

means ONE

|  |
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| A diagram of a data flow  Description automatically generated with medium confidence |

1. Translate all the relationships in Question 7 (model) to English.

|  |
| --- |
| An Order has many order details.  Order details refer to one order.  A customer has many orders.  Orders refer to one customer. |

**Part B**  
Create a relationship diagram for all the tables in the database. Use the MODEL tab to see the tables (entities) and their relationships.

Your diagram must include:

* All 8 tables
* The names of the entities (tables)
* The attributes (columns) for each table
* Lines representing the relationships between tables
* Crows Foot Symbols on the lines representing the type of relationship (1-1, 1-many)
* Required fields should be bolded
* Primary Key fields should be underlined **or** indicated with a PK beside it.
* Child fields in the relationships should be indicated with an FK beside it.

Use Lucidchart to draw you diagram. Save the diagram as an image and insert it here in the following box.

|  |
| --- |
| A diagram of a computer  Description automatically generated with medium confidence |

Good Luck.