

Database Design Project

Oracle Baseball League Store Database

Project Scenario:

You are a small consulting company specializing in database development. You have just been awarded the contract to develop a data model for a database application system for a small retail store called Oracle Baseball League (OBL).

The Oracle Baseball League store serves the entire surrounding community selling baseball kit. The OBL has two types of customer, there are individuals who purchase items like balls, cleats, gloves, shirts, screen printed t-shirts, and shorts. Additionally customers can represent a team when they purchase uniforms and equipment on behalf of the team.

Teams and individual customers are free to purchase any item from the inventory list, but teams get a discount on the list price depending on the number of players. When a customer places an order we record the order items for that order in our database.

OBL has a team of three sales representatives that officially only call on teams but have been known to handle individual customer complaints.

Section 6 Lesson 3 Exercise : Data Definition Language

Use DDL to build and maintain database tables (S6L3 Objective 3)

Part 1: Reading information from a script

In this exercise you will use the “obl Sports.ddl” file to consolidate your knowledge of DDL.

Open the “obl Sports.ddl” in a text editor.

1. How many tables have been created using the CREATE TABLE statement?
2. How many columns are created for the price history table?
3. What statement is used to enforce the constraint that the category column of the items table must have a value?
4. What is the name of the foreign key constraint between the customers and customer addresses tables?
5. What are the lowest and highest values that can be stored in the commission_rate column for the sales_representatives table?
6. What are the lowest and highest values that can be stored in the price column for the price_history table?
7. What are the 3 columns that make up the primary key for the price_history table?

Part 2 : Updating Constraints

Log-in to APEX and go to the SQL commands environment

Modifying a column

1. Run the DESCRIBE command on the orders table to view its structure.
2. **Task:** Add a default constraint that will use today's date to assign a value to the odr_date column of the orders table if no date is provided.
3. Run the DESCRIBE command again to verify the command was successful.

Adding a check constraint

1. Run the DESCRIBE command on the customers table to view its structure.
2. **Task:** Add a check constraint that will not allow the customers current balance to go below zero.
3. Run the DESCRIBE command again to verify the command was successful.
4. A check constraint is not shown in the results of a describe command.
 - a. Go to the Object Browser
 - b. Select the customers table.
 - c. Click on the CONSTRAINTS tab.
 - d. You will see your constraint here.

Adding a column

The client has decided that they would like a separate column for the customer's mobile phone number. This is an optional column that will be required to store 11 digits.

1. Run the DESCRIBE command on the customers table to view its structure.
2. **Task:** Add column that will satisfy the clients requirements
3. Run the DESCRIBE command on the customers table to view its structure.

Dropping a column

The client has decided that they don't need the mobile number column as most customers only provide a single contact number and that is already catered for with the existing phone_number column.

1. Run the DESCRIBE command on the customers table to view its structure.
2. **Task:** Drop the column that was created to store the mobile phone number.
3. Run the DESCRIBE command on the customers table to view its structure.

Part 1

1. 10
2. 6
3. NOT NULL
4. ctr_number
5. lowest : - 99.99
highest : 99.99
6. lowest : - 999999.99
highest : 999999.99
7. start_date , start_time , itm_number

Part 2

Modifying a column :

1.

The screenshot shows the Oracle SQL Developer interface. The left pane displays the database schema with tables like AQ\$_INTERNET_AGENT_PRIVS, AQ\$_INTERNET_AGENTS, AQ\$_KEY_SHARD_MAP, AQ\$_QUEUE_TABLES, AQ\$_QUEUES, AQ\$_SCHEDULES, CUSTOMERS, and ORDERS. The ORDERS table is selected, showing columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, and CURRENT_BALANCE. The main pane shows the SQL Worksheet with the following SQL code:

```
ALTER TABLE ordered_items ADD CONSTRAINT ordered_item_order_fk FOREIGN KEY ( odr_id )
REFERENCES orders ( id );

ALTER TABLE sales_rep_addresses ADD CONSTRAINT sales_rep_add_sales_rep_fk FOREIGN KEY ( id )
REFERENCES sales_representatives ( id );

ALTER TABLE sales_representatives ADD CONSTRAINT sales_rep_sales_rep_fk FOREIGN KEY ( supervisor_id ) REFERENCES sales_representatives ( id );

CREATE OR REPLACE TRIGGER fntm_orders BEFORE
UPDATE OF ctr_number ON orders
BEGIN
raise_application_error(
-20225,
'Mon Transferable FK constraint on table orders is violated'
);
END;
```

The Script Output pane shows the results of the SQL execution:

Name	Null?	Type
ID	NOT NULL	VARCHAR2(9)
ORD_DATE	NOT NULL	DATE
ORD_TIME	NOT NULL	DATE
NUMBER_OF_UNITS	NOT NULL	NUMBER(2)
CTR_NUMBER	NOT NULL	VARCHAR2(6)

2.

The screenshot shows the Oracle SQL Developer interface. The left pane displays the database schema with tables like AQ\$_INTERNET_AGENT_PRIVS, AQ\$_INTERNET_AGENTS, AQ\$_KEY_SHARD_MAP, AQ\$_QUEUE_TABLES, AQ\$_QUEUES, AQ\$_SCHEDULES, CUSTOMERS, and ORDERS. The ORDERS table is selected, showing columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, and CURRENT_BALANCE. The main pane shows the SQL Worksheet with the following SQL code:

```
ALTER TABLE sales_rep_addresses ADD CONSTRAINT sales_rep_add_sales_rep_fk FOREIGN KEY ( id )
REFERENCES sales_representatives ( id );

ALTER TABLE sales_representatives ADD CONSTRAINT sales_rep_sales_rep_fk FOREIGN KEY ( supervisor_id ) REFERENCES sales_representatives ( id );

CREATE OR REPLACE TRIGGER fntm_orders BEFORE
UPDATE OF ctr_number ON orders
BEGIN
raise_application_error(
-20225,
'Mon Transferable FK constraint on table orders is violated'
);
END;
```

The Script Output pane shows the results of the SQL execution:

Name	Null?	Type
ID	NOT NULL	VARCHAR2(9)
ORD_DATE	NOT NULL	DATE
ORD_TIME	NOT NULL	DATE
NUMBER_OF_UNITS	NOT NULL	NUMBER(2)
CTR_NUMBER	NOT NULL	VARCHAR2(6)

Table ORDERS altered.

3.

The screenshot shows the Oracle SQL Developer interface with a SQL script being executed. The script includes several SQL statements to modify the database schema:

```

ALTER TABLE sales_rep_addresses ADD CONSTRAINT sales_rep_add_sales_rep_fk FOREIGN KEY ( id )
REFERENCES sales_representatives ( id );

ALTER TABLE sales_representatives ADD CONSTRAINT sales_rep_sales_rep_fk FOREIGN KEY ( supervisor_id ) REFERENCES sales_representatives ( id );

CREATE OR REPLACE TRIGGER fntm_orders BEFORE
UPDATE OF ctr_number ON orders
BEGIN
    raise_application_error(
        -20225,
        'Non Transferable FK constraint on table orders is violated'
    );
END;

```

The Script Output window shows the following results:

```

Table ORDERS altered.

Name      Null?     Type
-----
ID         NOT NULL VARCHAR2(9)
ORD_DATE  NOT NULL DATE
ORD_TIME  NOT NULL DATE
NUMBER_OF_UNITS NOT NULL NUMBER(2)
CTR_NUMBER NOT NULL VARCHAR2(6)

```

Adding a check constraint :

1.

The screenshot shows the Oracle SQL Developer interface with a SQL script being executed. The script includes several SQL statements to modify the database schema:

```

ALTER TABLE sales_rep_addresses ADD CONSTRAINT sales_rep_add_sales_rep_fk FOREIGN KEY ( id )
REFERENCES sales_representatives ( id );

ALTER TABLE sales_representatives ADD CONSTRAINT sales_rep_sales_rep_fk FOREIGN KEY ( supervisor_id ) REFERENCES sales_representatives ( id );

CREATE OR REPLACE TRIGGER fntm_orders BEFORE
UPDATE OF ctr_number ON orders
BEGIN
    raise_application_error(
        -20225,
        'Non Transferable FK constraint on table orders is violated'
    );
END;

describe orders;
alter table orders
modify (odr_date DATE DEFAULT SYSDATE);
describe orders;
describe customers;

```

The Script Output window shows the following results:

```

CTR_NUMBER NOT NULL VARCHAR2(6)
EMAIL       NOT NULL VARCHAR2(50)
FIRST_NAME  NOT NULL VARCHAR2(20)
LAST_NAME   NOT NULL VARCHAR2(30)
PHONE_NUMBER NOT NULL VARCHAR2(11)
CURRENT_BALANCE NOT NULL NUMBER(6,2)
SRE_ID      VARCHAR2(4)
TEM_ID      VARCHAR2(4)
LOYALTY_CARD_NUMBER VARCHAR2(6)

```

2.

Oracle SQL Developer: C:\Users\Asus\AppData\Roaming\SQL Developer\DB_1AB1.sql

File Edit View Navigate Run Source Team Tools Window Help

Connections

Tables (Filtered)

- AQS_INTERNET_AGENT_PRIVS
- AQS_INTERNET_AGENTS
- AQS_KEY_SHARD_MAP
- AQS_QUEUE_TABLES
- AQS_QUEUES
- AQS_SCHEDULES
- CUSTOMERS
 - CTR_NUMBER
 - EMAIL
 - FIRST_NAME
 - LAST_NAME
 - PHONE_NUMBER
 - CURRENT_BALANCE
 - SRE_ID
 - TEM_ID
 - LOYALTY_CARD_NUMBER

Reports

- All Reports
- Analytic View Reports
- Data Dictionary Reports
- Data Modeler Reports
- OLAP Reports
- TimesTen Reports
- User Defined Reports

SQL Worksheet: History

Worksheet Query Builder

```

ALTER TABLE sales_representatives ADD CONSTRAINT sales_rep_sales_rep_fk FOREIGN KEY ( supervisor_id ) REFERENCES sales_representatives ( id );

CREATE OR REPLACE TRIGGER fntm_orders BEFORE
UPDATE OF ctr_number ON orders
BEGIN
    raise_application_error(
        -20215,
        'Non Transferable FK constraint on table orders is violated'
    );
END;
/

describe orders;
alter table orders
modify (odr_date DATE DEFAULT SYSDATE);
describe orders;

describe customers;
alter table customers
add constraint cus_current_balance check (current_balance >= 0);

```

Script Output

Task completed in 0.26 seconds

Column Name	Data Type	Nullable
FIRST_NAME	NOT NULL VARCHAR2(20)	NO
LAST_NAME	NOT NULL VARCHAR2(30)	NO
PHONE_NUMBER	NOT NULL VARCHAR2(11)	NO
CURRENT_BALANCE	NOT NULL NUMBER(6,2)	NO
SRE_ID	VARCHAR2(4)	NO
TEM_ID	VARCHAR2(4)	NO
LOYALTY_CARD_NUMBER	VARCHAR2(6)	NO

Table CUSTOMERS altered.

Click on an identifier with the Control key down to perform "Go to Declaration"

Line 138 Column 65 | Insert | Modified | Windows: C

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3.

Oracle SQL Developer: C:\Users\Asus\AppData\Roaming\SQL Developer\DB_1AB1.sql

File Edit View Navigate Run Source Team Tools Window Help

Connections

Tables (Filtered)

- AQS_INTERNET_AGENT_PRIVS
- AQS_INTERNET_AGENTS
- AQS_KEY_SHARD_MAP
- AQS_QUEUE_TABLES
- AQS_QUEUES
- AQS_SCHEDULES
- CUSTOMERS
 - CTR_NUMBER
 - EMAIL
 - FIRST_NAME
 - LAST_NAME
 - PHONE_NUMBER
 - CURRENT_BALANCE
 - SRE_ID
 - TEM_ID
 - LOYALTY_CARD_NUMBER

Reports

- All Reports
- Analytic View Reports
- Data Dictionary Reports
- Data Modeler Reports
- OLAP Reports
- TimesTen Reports
- User Defined Reports

SQL Worksheet: History

Worksheet Query Builder

```

ALTER TABLE sales_representatives ADD CONSTRAINT sales_rep_sales_rep_fk FOREIGN KEY ( supervisor_id ) REFERENCES sales_representatives ( id );

CREATE OR REPLACE TRIGGER fntm_orders BEFORE
UPDATE OF ctr_number ON orders
BEGIN
    raise_application_error(
        -20215,
        'Non Transferable FK constraint on table orders is violated'
    );
END;
/

describe orders;
alter table orders
modify (odr_date DATE DEFAULT SYSDATE);
describe orders;

describe customers;
alter table customers
add constraint cus_current_balance check (current_balance >= 0);
describe customers;

```

Script Output

Task completed in 0.03 seconds

Column Name	Data Type	Nullable
CTR_NUMBER	NOT NULL VARCHAR2(6)	NO
EMAIL	NOT NULL VARCHAR2(50)	NO
FIRST_NAME	NOT NULL VARCHAR2(20)	NO
LAST_NAME	NOT NULL VARCHAR2(30)	NO
PHONE_NUMBER	NOT NULL VARCHAR2(11)	NO
CURRENT_BALANCE	NOT NULL NUMBER(6,2)	NO
SRE_ID	VARCHAR2(4)	NO
TEM_ID	VARCHAR2(4)	NO
LOYALTY_CARD_NUMBER	VARCHAR2(6)	NO

Table CUSTOMERS altered.

Click on an identifier with the Control key down to perform "Go to Declaration"

Line 139 Column 20 | Insert | Modified | Windows: C

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2.

Oracle SQL Developer: C:\Users\Asus\AppData\Roaming\SQL Developer\DB_1\lab1.sql

Connections: Tables (Filtered)

- AQS_INTERNET_AGENT_PRIVS
- AQS_INTERNET_AGENTS
- AQS_KEY_SHARD_MAP
- AQS_QUEUE_TABLES
- AQS_QUEUES
- AQS_SCHEDULES
- CUSTOMERS
 - CTR_NUMBER
 - EMAIL
 - FIRST_NAME
 - LAST_NAME
 - PHONE_NUMBER
 - CURRENT_BALANCE
 - SRE_ID
 - TEM_ID
 - LOYALTY_CARD_NUMBER

Reports: All Reports, Analytic View Reports, Data Dictionary Reports, Data Modeler Reports, OLAP Reports, TimesTen Reports, User Defined Reports

SQL Worksheet: History

Worksheet: Query Builder

```

BEGIN
  raise_application_error(
    -20225,
    'Non Transferable FK constraint on table orders is violated'
  );
END;

describe orders;
alter table orders
modify (odr_date DATE DEFAULT SYSDATE);
describe orders;

describe customers;
alter table customers
add constraint cus_current_balance check (current_balance >= 0);
describe customers;

describe customers;
alter table customers
add mobile_phone_number number(11);

```

Script Output: Task completed in 0.286 seconds

```

FIRST_NAME      NOT NULL VARCHAR2(30)
LAST_NAME       NOT NULL VARCHAR2(30)
PHONE_NUMBER    NOT NULL VARCHAR2(11)
CURRENT_BALANCE NOT NULL NUMBER(6,2)
SRE_ID          VARCHAR2(4)
TEM_ID          VARCHAR2(4)
LOYALTY_CARD_NUMBER VARCHAR2(6)

Table CUSTOMERS altered.

```

Task completed in 0.286 seconds

Line: 163 Column: 26 | Insert | Modified | Windows: C

3.

Oracle SQL Developer: C:\Users\Asus\AppData\Roaming\SQL Developer\DB_1\lab1.sql

Connections: Tables (Filtered)

- AQS_INTERNET_AGENT_PRIVS
- AQS_INTERNET_AGENTS
- AQS_KEY_SHARD_MAP
- AQS_QUEUE_TABLES
- AQS_QUEUES
- AQS_SCHEDULES
- CUSTOMERS
 - CTR_NUMBER
 - EMAIL
 - FIRST_NAME
 - LAST_NAME
 - PHONE_NUMBER
 - CURRENT_BALANCE
 - SRE_ID
 - TEM_ID
 - LOYALTY_CARD_NUMBER

Reports: All Reports, Analytic View Reports, Data Dictionary Reports, Data Modeler Reports, OLAP Reports, TimesTen Reports, User Defined Reports

SQL Worksheet: History

Worksheet: Query Builder

```

raise_application_error(
  -20225,
  'Non Transferable FK constraint on table orders is violated'
);
END;

describe orders;
alter table orders
modify (odr_date DATE DEFAULT SYSDATE);
describe orders;

describe customers;
alter table customers
add constraint cus_current_balance check (current_balance >= 0);
describe customers;

describe customers;
alter table customers
add mobile_phone_number number(11);
describe customers;

```

Script Output: Task completed in 0.033 seconds

```

CTR_NUMBER      NOT NULL VARCHAR2(6)
EMAIL           NOT NULL VARCHAR2(50)
FIRST_NAME      NOT NULL VARCHAR2(30)
LAST_NAME       NOT NULL VARCHAR2(30)
PHONE_NUMBER    NOT NULL VARCHAR2(11)
CURRENT_BALANCE NOT NULL NUMBER(6,2)
SRE_ID          VARCHAR2(4)
TEM_ID          VARCHAR2(4)
LOYALTY_CARD_NUMBER VARCHAR2(6)
MOBILE_PHONE_NUMBER NUMBER(11)

```

Task completed in 0.033 seconds

Line: 164 Column: 26 | Insert | Modified | Windows: C

Dropping a column :

1.

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Tables (Filtered)' pane lists the 'CUSTOMERS' table with its columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, CURRENT_BALANCE, SRE_ID, TEM_ID, LOYALTY_CARD_NUMBER, and MOBILE_PHONE_NUMBER. The main workspace displays a SQL script with the following content:

```
/*Mon Transferable FK constraint on table orders is violated*/
END;
/

describe orders;
alter table orders
modify (odr_date DATE DEFAULT SYSDATE);
describe orders;

describe customers;
alter table customers
add constraint cus_current_balance check (current_balance >= 0);
describe customers;

describe customers;
alter table customers
add mobile_phone_number number(11);
describe customers;

describe customers;
```

The 'Script Output' pane at the bottom shows the results of the previous commands:

TABLE	TABLESPACE	CLUSTER	PARTITIONED	LOGGING	TABLESPACE	CLUSTER	PARTITIONED	LOGGING	TABLESPACE	CLUSTER	PARTITIONED	LOGGING
CUSTOMERS												
CTR_NUMBER												
EMAIL												
FIRST_NAME												
LAST_NAME												
PHONE_NUMBER												
CURRENT_BALANCE												
SRE_ID												
TEM_ID												
LOYALTY_CARD_NUMBER												
MOBILE_PHONE_NUMBER												

2.

The screenshot shows the Oracle SQL Developer interface after the 'mobile_phone_number' column has been dropped. The 'Script Output' pane now shows the updated table structure:

TABLE	TABLESPACE	CLUSTER	PARTITIONED	LOGGING	TABLESPACE	CLUSTER	PARTITIONED	LOGGING	TABLESPACE	CLUSTER	PARTITIONED	LOGGING
CUSTOMERS												
CTR_NUMBER												
EMAIL												
FIRST_NAME												
LAST_NAME												
PHONE_NUMBER												
CURRENT_BALANCE												
SRE_ID												
TEM_ID												
LOYALTY_CARD_NUMBER												

The message 'Table CUSTOMERS altered.' is displayed at the bottom of the 'Script Output' pane.

3.

Oracle SQL Developer: C:\Users\Asus\AppData\Roaming\SQL Developer\DB_LAB1.sql

File Edit View Navigate Run Source Team Tools Window Help

Connections

Tables (Filtered)

- [-] AQ\$_INTERNET_AGENT_PRIVS
- [-] AQ\$_INTERNET_AGENTS
- [-] AQ\$_KEY_SHARD_MAP
- [-] AQ\$_QUEUE_TABLES
- [-] AQ\$_QUEUES
- [-] AQ\$_SCHEDULES
- [-] CUSTOMERS
 - CTR_NUMBER
 - EMAIL
 - FIRST_NAME
 - LAST_NAME
 - PHONE_NUMBER
 - CURRENT_BALANCE
 - SRE_ID
 - TEM_ID
 - LOYALTY_CARD_NUMBER

Reports

- [-] All Reports
- [-] Analytic View Reports
- [-] Data Dictionary Reports
- [-] Data Modeler Reports
- [-] OLAP Reports
- [-] TimesTen Reports
- [-] User Defined Reports

SQL Worksheet: History

Worksheet Query Builder

```
--  
--  
describe orders;  
alter table orders  
modify (odr_date DATE DEFAULT SYSDATE);  
describe orders;  
  
describe customers;  
alter table customers  
add constraint cus_current_balance check (current_balance >= 0);  
describe customers;  
  
describe customers;  
alter table customers  
add mobile_phone_number number(11);  
describe customers;  
  
describe customers;  
alter table customers  
drop (MOBILE_PHONE_NUMBER);  
describe customers;
```

Script Output

Task completed in 0.029 seconds

NAME	TYPE
CTR_NUMBER	NOT NULL VARCHAR2(6)
EMAIL	NOT NULL VARCHAR2(50)
FIRST_NAME	NOT NULL VARCHAR2(20)
LAST_NAME	NOT NULL VARCHAR2(30)
PHONE_NUMBER	NOT NULL VARCHAR2(11)
CURRENT_BALANCE	NOT NULL NUMBER(6,2)
SRE_ID	VARCHAR2(4)
TEM_ID	VARCHAR2(4)
LOYALTY_CARD_NUMBER	VARCHAR2(6)

Unit: 169 Column: 20 | Insert | Modified | Windows: C

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