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.

## LAB 3: DATA MANIPULATION LANGUAGE DML2 (PART 1 - PART 6)

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SECTION: 8

# Section 6 Lesson 6  Exercise 1:  Retrieving Data Using SELECT

## Write and Execute SELECT statements (S6L6 Objective 2)

In this exercise you will retrieve data that is stored in the database system by using a SELECT statement.

### Part 1:  Retrieving all columns from a table.

Using the SELECT * statement show all data stored in the following tables:

1. customers.

   Answer:

```
1  SELECT * FROM CUSTOMERS;
```

Results | Explain | Describe | Saved SQL | History

| CTR_NUMBER | EMAIL | FIRST_NAME | LAST_NAME | CURRENT_BALANCE | SRE_ID | TEM_ID | LOYALTY_CARD_NUMBER | PHONE_NUMBER |
|---|---|---|---|---|---|---|---|---|
| c00001 | bob.thornberry@heatmail.com | Robert | Thornberry | 150 | sr01 | t001 | - | 01234567898 |
| c00012 | Jjones@freemail.com | Jennifer | Jones | 0 | - | - | lc1015 | 01505214598 |
| c00101 | unknown@here.com | John | Doe | 987.5 | sr01 | t002 | - | 03216547808 |
| c01986 | margal87@delphiview.com | Maria | Galant | 125.65 | sr03 | t003 | - | 01442736589 |
| c00103 | MurciaA@globaltech.com | Andrew | Murcia | 85 | - | - | lc2341 | 07715246890 |
| c02001 | brianrog@hootech.com | Brian | Rogers | 50 | - | - | lc4587 | 01654564898 |

2. teams.

   Answer:

```
1  SELECT * FROM TEAMS;
```

Results | Explain | Describe | Saved SQL | History

| ID | NAME | NUMBER_OF_PLAYERS | DISCOUNT |
|---|---|---|---|
| t003 | Rovers | 8 | - |
| t001 | Rockets | 25 | 10 |
| t002 | Celtics | 42 | 20 |
| t004 | Jets | 10 | 5 |

3. items

   Answer:

```
1  SELECT * FROM ITEMS;
```

Results | Explain | Describe | Saved SQL | History

| ITM_NUMBER | NAME | DESCRIPTION | CATEGORY | COLOR | Size | ILT_ID |
|---|---|---|---|---|---|---|
| im01101044 | gloves | catcher mitt | clothing | brown | m | il010230124 |
| im01101045 | under shirt | top worn under the game top | clothing | white | s | il010230125 |
| im01101046 | socks | team socks with emblem | clothing | range | l | il010230126 |
| im01101048 | premium bat | high quaity basball bat | equipment | - | - | il010230128 |
| im01101047 | game top | team shirt with emblem | clothing | range | m | il010230127 |

**Part 2: Selecting Specific Columns**

1. Display the customer number, first name, last name, email and phone number of the customers.

   Answer:

```
1  SELECT ctr_number, first_name, last_name, email, phone_number FROM customers;
```

Results | Explain | Describe | Saved SQL | History

| CTR_NUMBER | FIRST_NAME | LAST_NAME | EMAIL | PHONE_NUMBER |
|---|---|---|---|---|
| c00001 | Robert | Thornberry | bob.thornberry@heatmail.com | 01234567898 |
| c00012 | Jennifer | Jones | Jjones@freemail.com | 01505214598 |
| c00101 | John | Doe | unknown@here.com | 03216547808 |
| c01986 | Maria | Galant | margal87@delphiview.com | 01442736589 |
| c00103 | Andrew | Murcia | MurciaA@globaltech.com | 07715246890 |
| c02001 | Brian | Rogers | brianrog@hootech.com | 01654564898 |

2. Display the name and number of players for each team.

   Answer:

```
1  SELECT name, number_of_players FROM teams;
```

Results | Explain | Describe | Saved SQL | History

| NAME | NUMBER_OF_PLAYERS |
|---|---|
| Rovers | 8 |
| Rockets | 25 |
| Celtics | 42 |
| Jets | 10 |

3. Display the name, description and category for every item in the table.

   Answer:

```
1  SELECT name, description, category FROM ITEMS;
```

Results | Explain | Describe | Saved SQL | History

| NAME | DESCRIPTION | CATEGORY |
|---|---|---|
| gloves | catcher mitt | clothing |
| under shirt | top worn under the game top | clothing |
| socks | team socks with emblem | clothing |
| premium bat | high quaity basball bat | equipment |
| game top | team shirt with emblem | clothing |

## Section 6 Lesson 6  Exercise 2:  Retrieving Data Using SELECT

### Write and Execute SELECT statements (S6L6 Objective 2)

In this exercise you will retrieve data that is stored in the database system by using a SELECT statement.

#### Part 1: Using Arithmetic Operators

1. Every customer has been told they can pay off their current balance over a 12 month period.  Display the customer's first name, last name, current balance and monthly payment.

   Answer:

```
1   SELECT first_name, last_name, current_balance, current_balance / 12 FROM customers;
```

Results | Explain | Describe | Saved SQL | History

| FIRST_NAME | LAST_NAME | CURRENT_BALANCE | CURRENT_BALANCE/12 |
|---|---|---|---|
| Robert | Thornberry | 150 | 12.5 |
| Jennifer | Jones | 0 | 0 |
| John | Doe | 987.5 | 82.291666666666666666666666666666666667 |
| Maria | Galant | 125.65 | 10.470833333333333333333333333333333333 |
| Andrew | Murcia | 85 | 7.083333333333333333333333333333333333 |
| Brian | Rogers | 50 | 4.166666666666666666666666666666666667 |

2. Obl is considering giving a gift card to all its customers of 5.00 that can be used to reduce their current balance. Write a query that will show the customers first name, last name, customer number, current balance and the value of their balance minus the gift value.

   Answer:

```
1   SELECT first_name, last_name, ctr_number, current_balance, current_balance - 5
2   FROM customers;
```

Results | Explain | Describe | Saved SQL | History

| FIRST_NAME | LAST_NAME | CTR_NUMBER | CURRENT_BALANCE | CURRENT_BALANCE-5 |
|---|---|---|---|---|
| Robert | Thornberry | c00001 | 150 | 145 |
| Jennifer | Jones | c00012 | 0 | -5 |
| John | Doe | c00101 | 987.5 | 982.5 |
| Maria | Galant | c01986 | 125.65 | 120.65 |
| Andrew | Murcia | c00103 | 85 | 80 |
| Brian | Rogers | c02001 | 50 | 45 |

3. What would be the problem with implementing this scheme?

   Answer: The current balance amount allows value to be below 0.

## Part 2 : Using Column Aliases

1. You previously wrote a query that display the customer's first name, last name, current balance and monthly payment. Rewrite the query to use First Name, Last Name, Balance and Monthly Repayments as the column aliases. The aliases are to be shown exactly as described (case sensitive).

   Answer:

```
1  SELECT first_name "First Name", last_name "Last Name",
2  current_balance "Balance", current_balance / 12 "Monthly Repayments"
3  FROM customers;
```

Results | Explain | Describe | Saved SQL | History

| First Name | Last Name | Balance | Monthly Repayments |
|---|---|---|---|
| Robert | Thornberry | 150 | 12.5 |
| Jennifer | Jones | 0 | 0 |
| John | Doe | 987.5 | 82.291666666666666666666666666666666666667 |
| Maria | Galant | 125.65 | 10.470833333333333333333333333333333333 |
| Andrew | Murcia | 85 | 7.083333333333333333333333333333333333 |
| Brian | Rogers | 50 | 4.166666666666666666666666666666666666667 |

## Part 3: Using Literal Character Strings

1. Write a query that will display the team information in the following format:

   The Rockets team has 25 players and receives a discount of 10 percent. Use **Team Information** as the column alias.

   Answer:

```
1  SELECT 'The ' ||name || ' team has ' ||number_of_players|| ' players and receives a
2  discount of ' ||discount|| ' percent.' AS "Team Information"
3  FROM teams;
```

Results | Explain | Describe | Saved SQL | History

| Team Information |
|---|
| The Rovers team has 8 players and receives a discount of percent. |
| The Rockets team has 25 players and receives a discount of 10 percent. |
| The Celtics team has 42 players and receives a discount of 20 percent. |
| The Jets team has 10 players and receives a discount of 5 percent. |

2. Why does the last team not show a discount?

   Answer: Because the value of discount for Rover's team is shown to be NULL value.

## Section 6 Lesson 7  Exercise 1:  Restricting Data Using WHERE

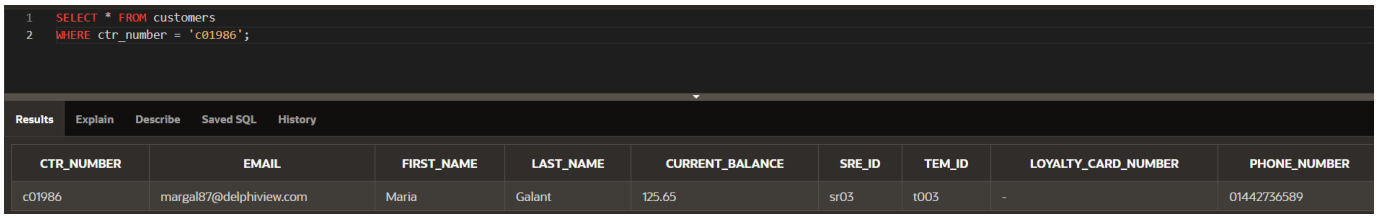
### Limit rows using WHERE (S6L7 Objective 1)

In this exercise you will refine the data that is returned in your query by adding a WHERE clause to your SELECT statement.

**Part 1: Using the WHERE Clause.**

1. Using the unique customer number in the where clause display all columns for Maria Galant.

   Answer:



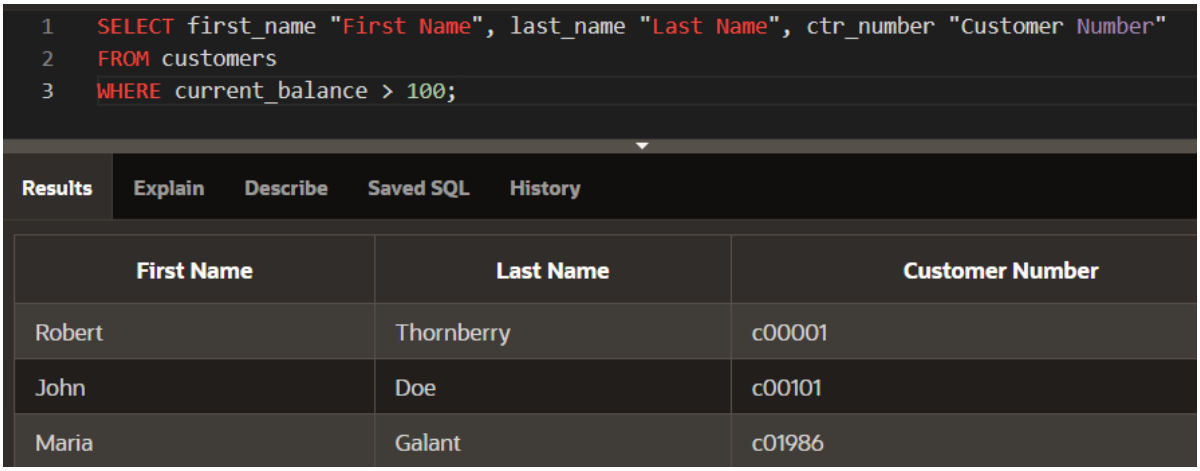
```
1  SELECT * FROM customers
2  WHERE ctr_number = 'c01986';
```

Results | Explain | Describe | Saved SQL | History

| CTR_NUMBER | EMAIL | FIRST_NAME | LAST_NAME | CURRENT_BALANCE | SRE_ID | TEM_ID | LOYALTY_CARD_NUMBER | PHONE_NUMBER |
|---|---|---|---|---|---|---|---|---|
| c01986 | margal87@delphiview.com | Maria | Galant | 125.65 | sr03 | t003 | - | 01442736589 |

2. Display the first name, last name and customer number for all customers who have a current balance of greater than 100.  Use an appropriate alias for your column headings.

   Answer:



```
1  SELECT first_name "First Name", last_name "Last Name", ctr_number "Customer Number"
2  FROM customers
3  WHERE current_balance > 100;
```

Results | Explain | Describe | Saved SQL | History

| First Name | Last Name | Customer Number |
|---|---|---|
| Robert | Thornberry | c00001 |
| John | Doe | c00101 |
| Maria | Galant | c01986 |

3. Display the order id, date and time of all orders that were placed before the 28th of May 2019. Use an appropriate alias for your column headings.

   Answer:

```
1  SELECT id "Order ID", odr_date "Order Date", odr_time "Order Time"
2  FROM orders
3  WHERE odr_date < TO_DATE('28-May-2019', 'DD-MM-YYYY');
```

Results | Explain | Describe | Saved SQL | History

| Order ID | Order Date | Order Time |
|---|---|---|
| or0101250 | 04/17/2017 | 04/17/2017 |
| or0101681 | 06/02/2017 | 06/02/2017 |
| or0101350 | 05/24/2017 | 05/24/2017 |
| or0101425 | 05/28/2017 | 05/28/2017 |
| or0101750 | 06/18/2017 | 06/18/2017 |

**Part 2: Range Conditions: BETWEEN Operator**

1. Display the inventory id, cost and number of units using appropriate aliases for all items that have a trade cost of between 3.00 and 15.00.

   Answer:

```
1  SELECT id "Inventory ID", cost "Cost", units "Units"
2  FROM inventory_list
3  WHERE cost BETWEEN 3.00 AND 15.00;
```

Results | Explain | Describe | Saved SQL | History

| Inventory ID | Cost | Units |
|---|---|---|
| il010230125 | 7.99 | 250 |
| il010230126 | 5.24 | 87 |

**Part 3: Membership Conditions: IN Operator**

1. Display the inventory id, cost and number of units using appropriate aliases for all items that have 50, 100, 150 or 200 units in stock.

   Answer:

```
1  SELECT id "Inventory ID", cost "Cost", units "Units"
2  FROM inventory_list
3  WHERE units IN (50, 100, 150, 200);
```

Results | Explain | Describe | Saved SQL | History

| Inventory ID | Cost | Units |
|---|---|---|
| il010230124 | 2.5 | 100 |

**Part 4: Membership Conditions: NOT IN Operator**

1. Display the inventory id, cost and number of units using appropriate aliases for all items that do not have 50, 100, 150 or 200 units in stock.

   Answer:

```
1  SELECT id "Inventory ID", cost "Cost", units "Units"
2  FROM inventory_list
3  WHERE units NOT IN (50, 100, 150, 200);
```

Results | Explain | Describe | Saved SQL | History

| Inventory ID | Cost | Units |
|---|---|---|
| il010230125 | 7.99 | 250 |
| il010230126 | 5.24 | 87 |
| il010230127 | 18.95 | 65 |
| il010230128 | 97.46 | 8 |

**Part 5: Pattern Matching: LIKE Operator**

1. Display item number and name of all items that have a name that begins with g. Use an appropriate alias for your column headings.

   Answer:

```
1  SELECT itm_number "Item Number", name "Item Name"
2  FROM items
3  WHERE name LIKE 'g%';
```

Results | Explain | Describe | Saved SQL | History

| Item Number | Item Name |
|---|---|
| im01101044 | gloves |
| im01101047 | game top |

**Part 6 : Pattern Matching: Combining Wildcard Characters with the LIKE Operator**

1. Display item number and name of all items that have a name that contain a lowercase o. Use an appropriate alias for your column headings.

   Answer:

```
1  SELECT itm_number "Item Number", name "Item Name"
2  FROM items
3  WHERE name LIKE '_o%';
```

Results | Explain | Describe | Saved SQL | History

| Item Number | Item Name |
|---|---|
| im01101046 | socks |

## Section 6 Lesson 7  Exercise 2:  Restricting Data Using WHERE

### Limit rows using WHERE (S6L7 Objective 1)

In this exercise you will refine the data that is returned in your query by adding a WHERE clause to your SELECT statement.

**Part 1: Using the NULL Conditions**

1. Write a query that will display information for teams that don't receive a discount in the following format:

   The Rovers team has 25 players and does not receive a discount. Use **Team Information** as the column alias.

   Answer:

```
1  SELECT 'The ' ||name|| ' team has ' ||number_of_players|| ' players and does not
2  receive a discount.'
3  AS "Team Information"
4  FROM teams
5  WHERE discount IS NULL;
```

Results | Explain | Describe | Saved SQL | History

| Team Information |
| --- |
| The Rovers team has 8 players and does not receive a discount. |

2. Write a query that will display information for only teams that receive a discount in the following format:

   The Rockets team has 25 players and receives a discount of 10 percent. Use **Team Information** as the column alias.

   Answer:

```
1  SELECT 'The ' ||name|| ' team has ' ||number_of_players|| ' players and does not
2  receive a discount.'
3  AS "Team Information"
4  FROM teams
5  WHERE discount IS NOT NULL;
```

Results | Explain | Describe | Saved SQL | History

| Team Information |
| --- |
| The Rockets team has 25 players and does not receive a discount. |
| The Celtics team has 42 players and does not receive a discount. |
| The Jets team has 10 players and does not receive a discount. |

**Part 2: Logical Operators: AND**

1. Write a query that will display the customer number, address line 1 and postal code for customers that live in the starford area of Liverpool. Use Customer Number, Street Address and Postal Code as the column aliases.

   Answer:

```
1  SELECT ctr_number "Customer Number", Address_line_1 "Street Address", zip_code "Postal Code"
2  FROM customers_addresses
3  WHERE city = 'Liverpool' AND address_line_2 = 'Starford';
```

Results | Explain | Describe | Saved SQL | History

| Customer Number | Street Address | Postal Code |
|---|---|---|
| c00001 | 17 Gartsquare Road | LP89JHK |

**Part 3: Logical Operators: OR**

1. Write a query that will display the customer number, address line 1 and postal code for customers that live in either starford or Liverpool in general. Use Customer Number, Street Address and Postal Code as the column aliases.

   Answer:

```
1  SELECT ctr_number "Customer Number", Address_line_1 "Street Address", zip_code "Postal Code"
2  FROM customers_addresses
3  WHERE city = 'Liverpool' OR address_line_2 = 'Starford';
```

Results | Explain | Describe | Saved SQL | History

| Customer Number | Street Address | Postal Code |
|---|---|---|
| c00001 | 17 Gartsquare Road | LP89JHK |
| c00001 | 63 Acacia Drive | LP83JHR |
| c00001 | 83 Barrhill Drive | LP79HJK |

**Part 4: Logical Operators: NOT Equal To**

1. Write a query that will display the customer number, address line 1 and postal code for customers that do not live in Liverpool. Use Customer Number, Street Address and Postal Code as the column aliases.

   Answer:

```
1  SELECT ctr_number "Customer Number", Address_line_1 "Street Address", zip_code "Postal Code"
2  FROM customers_addresses
3  WHERE city NOT IN ('Liverpool');
```

Results | Explain | Describe | Saved SQL | History

| Customer Number | Street Address | Postal Code |
|---|---|---|
| c00101 | 54 Ropehill Crescent | ST45AGV |
| c01986 | 36 Watercress Lane | JP23YTH |

## Section 6 Lesson 8  Exercise 1:  Sorting Data Using ORDER BY

### Use the ORDER BY Clause to Sort SQL Results (S6L8 Objective 1)

In this exercise you will sort the order of the data that is returned in your query by adding an ORDER BY clause to the end of your SELECT statement.

1. Display the team name and number of players alphabetically in order of team name. Use an appropriate alias for your column headings.

   Answer:

```
1  SELECT name "Team Name", number_of_players "Number of Players"
2  FROM teams
3  ORDER BY name;
```

Results | Explain | Describe | Saved SQL | History

| Team Name | Number of Players |
|---|---|
| Celtics | 42 |
| Jets | 10 |
| Rockets | 25 |
| Rovers | 8 |

2. Display the team name and number of players in descending order of number of players. Use an appropriate alias for your column headings.

   Answer:

```
1  SELECT name "Team Name", number_of_players "Number of Players"
2  FROM teams
3  ORDER BY number_of_players DESC;
```

Results | Explain | Describe | Saved SQL | History

| Team Name | Number of Players |
|---|---|
| Celtics | 42 |
| Rockets | 25 |
| Jets | 10 |
| Rovers | 8 |

3. Display the team name and number of players alphabetically in order of team name. Use Team Name for the name alias and Players for the number of players. Sort the output in descending order of name using the alias in the ORDER BY clause.

   Answer:

```
1  SELECT name "Team Name", number_of_players "Players"
2  FROM teams
3  ORDER BY "Team Name" DESC;
```

Results | Explain | Describe | Saved SQL | History

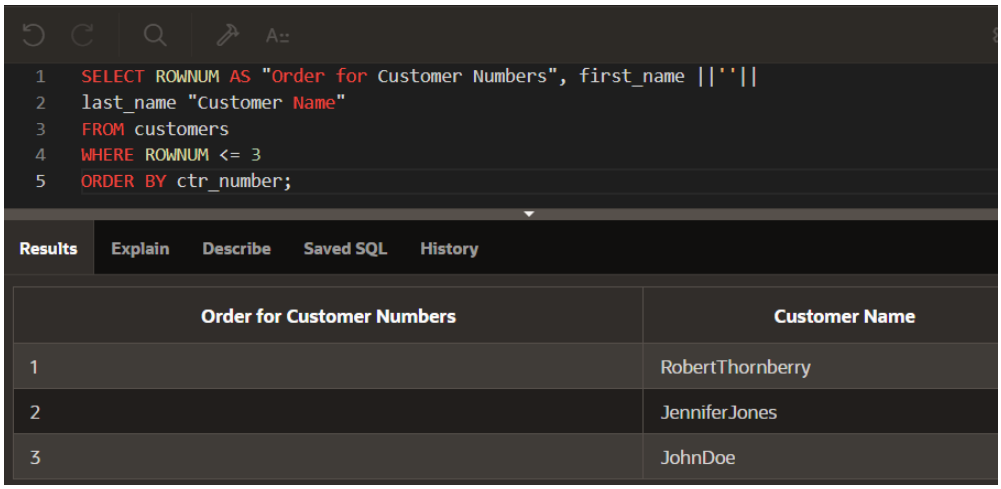
| Team Name | Players |
|---|---|
| Rovers | 8 |
| Rockets | 25 |
| Jets | 10 |
| Celtics | 42 |

## Section 6 Lesson 8  Exercise 2:  Sorting Data Using ORDER BY

### Part 1 : TOP-N-ANALYSIS (S6L8 Objective 3)

1. The customers are numbered sequentially with each new customer being assigned a higher customer number. Use TOP-N-ANALYSIS to only show the First and last name of the first three customers.  Show the customers first and last name in the same column using Customer Name as the column alias.

   Answer:



```
SELECT ROWNUM AS "Order for Customer Numbers", first_name ||''||
last_name "Customer Name"
FROM customers
WHERE ROWNUM <= 3
ORDER BY ctr_number;
```

Results | Explain | Describe | Saved SQL | History

| Order for Customer Numbers | Customer Name |
|---|---|
| 1 | RobertThornberry |
| 2 | JenniferJones |
| 3 | JohnDoe |

**Part 2 : Using a Substitution Variable (S6L8 Objective 4)**

1. Use a substitution variable that will allow you to enter the commission rate for the sales representatives. The first and last names should be displayed to screen for any sales representatives that earn that commission rate and the output should be ordered by their last name. Use an appropriate alias for your column headings.

   Answer: