FACULTY OF COMPUTING
UTM Johor Bahru

# SECD2523 – Database

## Lab 3: DML 2

SECTION: 08-SECJH

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SUBMISSION DATE: 12 DECEMBER 2023

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**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.

**SELECT ***
**FROM customers;**

```
1  SELECT *
2  FROM customers;
```

Results | Explain | Describe | Saved SQL | History

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

2. teams.

**SELECT ***
**FROM teams;**

```
1  SELECT *
2  FROM teams;
```

Results | Explain | Describe | Saved SQL | History

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

3. items

**SELECT ***
**FROM items;**

```
1  SELECT *
2  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 |
| im01101047 | game top | team shirt with emblem | clothing | range | m | il010230127 |
| im01101048 | premium bat | high quality basball bat | equipment | - | - | il010230128 |

5 rows returned in 0.01 seconds Download

**Part 2: Selecting Specific Columns**

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

**SELECT ctr_number, first_name, last_name,email,phone_number**
**FROM customers;**

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

6 rows returned in 0.01 seconds Download

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

**SELECT name, number_of_players**
**FROM teams;**

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

Results | Explain | Describe | Saved SQL | History

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

4 rows returned in 0.00 seconds Download

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

**SELECT name, description, category**
**FROM items;**

```
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 |
| game top | team shirt with emblem | clothing |
| premium bat | high quaity basball bat | equipment |

5 rows returned in 0.01 seconds Download

**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.

**SELECT first_name, last_name, current_balance, current_balance/12**
**FROM customers;**

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

Results | Explain | Describe | Saved SQL | History

| FIRST_NAME | LAST_NAME | CURRENT_BALANCE | CURRENT_BALANCE/12 |
|---|---|---|---|
| Brian | Rogers | 50 | 4.16666666666666666666666666666666666667 |
| Robert | Thornberry | 150 | 12.5 |
| Jennifer | Jones | 0 | 0 |
| John | Doe | 987.5 | 82.291666666666666666666666666666666667 |
| Andrew | Murcia | 85 | 7.08333333333333333333333333333333333333 |
| Maria | Galant | 125.65 | 10.470833333333333333333333333333333333 |

6 rows returned in 0.01 seconds Download

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.

**SELECT first_name, last_name, ctr_number, current_balance, current_balance-5**
**FROM customers;**

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

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3. What would be the problem with implementing this scheme?
**The current balance cannot be zero value**

## 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).

**SELECT first_name AS "First Name", last_name AS "Last Name", current_balance AS "Balance", current_balance/12 AS "Monthly Repayments"**
**FROM customers;**

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

Results | Explain | Describe | Saved SQL | History

| First Name | Last Name | Balance | Monthly Repayments |
|---|---|---|---|
| Brian | Rogers | 50 | 4.16666666666666666666666666666666666667 |
| Robert | Thornberry | 150 | 12.5 |
| Jennifer | Jones | 0 | 0 |
| John | Doe | 987.5 | 82.29166666666666666666666666666666666667 |
| Andrew | Murcia | 85 | 7.08333333333333333333333333333333333333 |
| Maria | Galant | 125.65 | 10.47083333333333333333333333333333333333 |

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## 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.

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

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

Results | Explain | Describe | Saved SQL | History

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

4 rows returned in 0.01 seconds Download

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

**It contains the zero value, which means doesn't equal zero.**

**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.
**SELECT***
**FROM customers**
**WHERE ctr_number = 'c01986';**

```
1  SELECT*
2  FROM customers
3  WHERE ctr_number = 'c01986';
4
```

Results | Explain | Describe | Saved SQL | History

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

1 rows returned in 0.01 seconds Download

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.
**SELECT first_name AS "First Name", last_name AS "Last Name", current_balance AS "Balance"**
**FROM customers**
**WHERE current_balance > 100;**

```
1  SELECT first_name AS "First Name", last_name AS "Last Name", current_balance AS "Balance"
2  FROM customers
3  WHERE current_balance > 100;
4
```

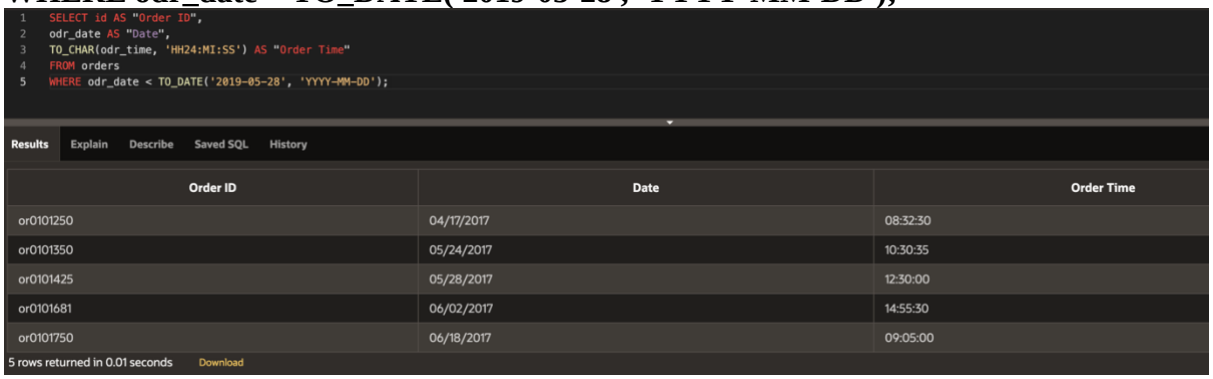
Results | Explain | Describe | Saved SQL | History

| First Name | Last Name | Balance |
|---|---|---|
| Robert | Thornberry | 150 |
| John | Doe | 987.5 |
| Maria | Galant | 125.65 |

3 rows returned in 0.01 seconds Download

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.

```
SELECT id AS "Order ID",
odr_date AS "Date",
TO_CHAR(odr_time, 'HH24:MI:SS') AS "Order Time"
FROM orders
WHERE odr_date < TO_DATE('2019-05-28', 'YYYY-MM-DD');
```



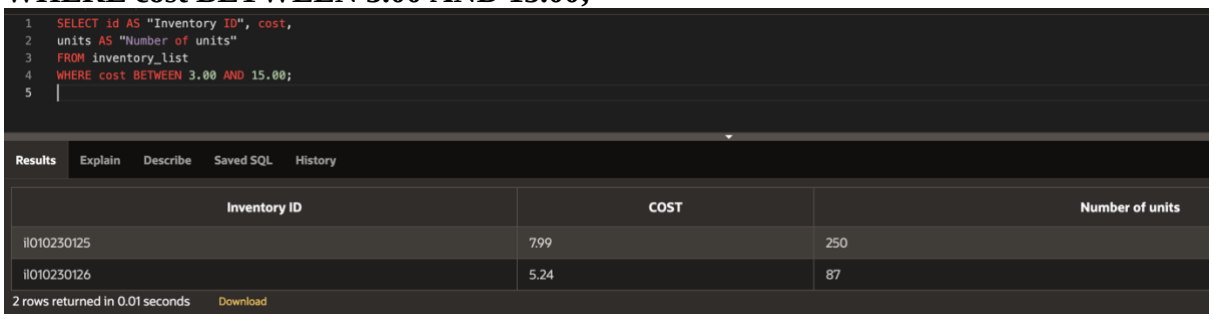
| Order ID | Date | Order Time |
|---|---|---|
| or0101250 | 04/17/2017 | 08:32:30 |
| or0101350 | 05/24/2017 | 10:30:35 |
| or0101425 | 05/28/2017 | 12:30:00 |
| or0101681 | 06/02/2017 | 14:55:30 |
| or0101750 | 06/18/2017 | 09:05:00 |

5 rows returned in 0.01 seconds Download

**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.

```
SELECT id AS "Inventory ID",
        cost,
        units AS "Number of units"
FROM inventory_list
WHERE cost BETWEEN 3.00 AND 15.00;
```



| Inventory ID | COST | Number of units |
|---|---|---|
| il010230125 | 7.99 | 250 |
| il010230126 | 5.24 | 87 |

2 rows returned in 0.01 seconds Download

**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.

```
SELECT id AS "Inventory ID", cost, units AS "Number of units"
FROM inventory_list
WHERE units IN (50,100,150,200)
```

| Inventory ID | COST | Number of units |
|---|---|---|
| il010230124 | 2.5 | 100 |

1 rows returned in 0.01 seconds Download

**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.

**SELECT id AS "Inventory ID", cost, units AS "Number of units"**
**FROM inventory_list**
**WHERE units NOT IN (50,100,150,200)**

```
1
2  SELECT id AS "Inventory ID", cost, units AS "Number of units" FROM inventory_list
3  WHERE units NOT IN (50,100,150,200)
4
```

Results | Explain | Describe | Saved SQL | History

| Inventory ID | COST | Number of units |
|---|---|---|
| il010230125 | 7.99 | 250 |
| il010230126 | 5.24 | 87 |
| il010230127 | 18.95 | 65 |
| il010230128 | 97.46 | 8 |

4 rows returned in 0.01 seconds Download

**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.

**SELECT itm_number AS “Item Number”, name**
**FROM items**
**WHERE name LIKE 'g%' ;**

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

Results | Explain | Describe | Saved SQL | History

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

2 rows returned in 0.01 seconds Download

**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.

**SELECT itm_number AS “Item Number” , name**
**FROM items**
**WHERE name LIKE '_o%';**

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

Results | Explain | Describe | Saved SQL | History

| Item Number | NAME |
|---|---|
| im01101046 | socks |

1 rows returned in 0.01 seconds Download

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

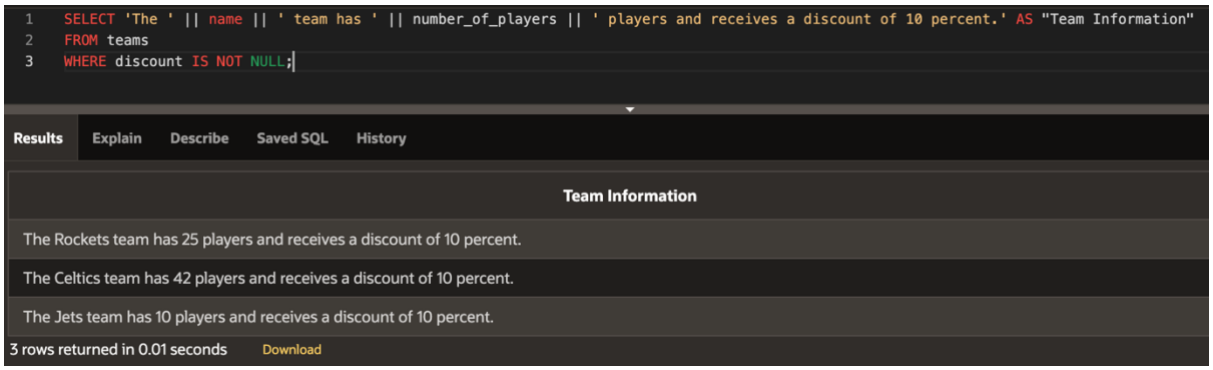
Limit rows using WHERE (S6L7 Objective 1)
In this exercise you will refine the data that is returned in your query by adding a WHERE clause to your SELECT statement.

**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.

**SELECT 'The' || name || ' team has ' || number_of_players || ' players and does not receive a discount.' AS "Team Information"**
**FROM teams**
**WHERE discount IS NULL;**


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.

**SELECT 'The ' || name || ' team has ' || number_of_players || ' players and receives a discount of 10 percent.' AS "Team Information"**
**FROM teams**
**WHERE discount IS NOT NULL;**



**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.

**SELECT ctr_number AS "Customer Number", Address_line_1 AS "Street Address", zip_code AS "Postal Code" FROM customers_addresses**
**WHERE city = 'Liverpool' AND address_line_2 = 'Starford';**


**Part 3: Logical Operators: OR**

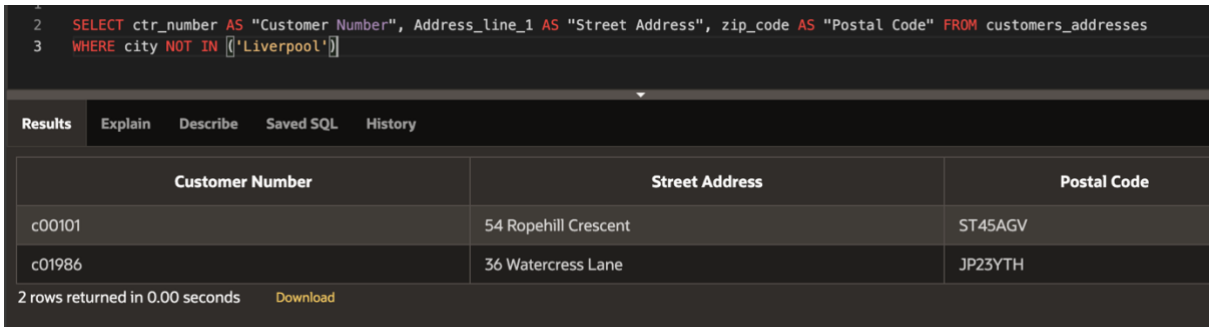
1.Write a query that will display the customer number, address line 1 and postal code for customers that live in either starford or Liverpool in general. Use Customer Number, Street Address and Postal Code as the column aliases.

**SELECT ctr_number AS "Customer Number", Address_line_1 AS "Street Address", zip_code AS "Postal Code" FROM customers_addresses**
**WHERE city = 'Liverpool' OR address_line_2 = 'Starford';**

**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.

**SELECT ctr_number AS "Customer Number", Address_line_1 AS "Street Address", zip_code AS "Postal Code" FROM customers_addresses**
**WHERE city NOT IN ('Liverpool')**



```
2  SELECT ctr_number AS "Customer Number", Address_line_1 AS "Street Address", zip_code AS "Postal Code" 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 |

2 rows returned in 0.00 seconds Download

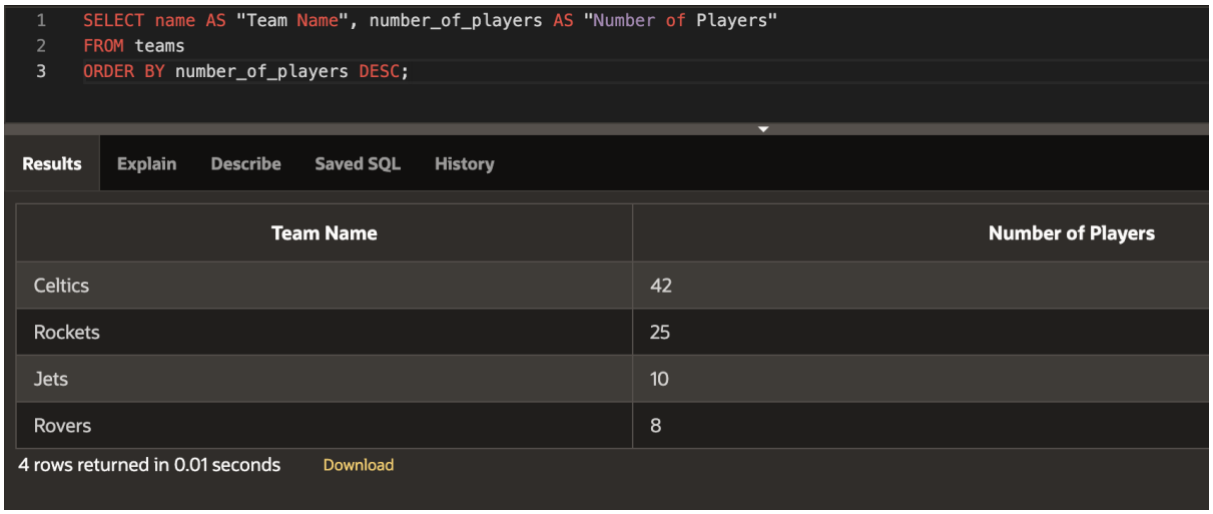
**Section 6 Lesson 8 Exercise 1: Sorting Data Using ORDER BY**
Use the ORDER BY Clause to Sort SQL Results (S6L8 Objective 1)
In this exercise you will sort the order of the data that is returned in your query by adding an ORDER BY clause to the end of your SELECT statement.

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

**SELECT name AS "Team Name", number_of_players AS "Number of Players"**
**FROM teams**
**ORDER BY name;**


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

**SELECT name AS "Team Name", number_of_players AS "Number of Players"**
**FROM teams**
**ORDER BY number_of_players DESC;**



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.

**SELECT name AS "Team Name", number_of_players AS "Number of Players"**
**FROM teams**
**ORDER BY "Team Name" DESC;**

**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.

**SELECT first_name || ' ' || last_name AS "Customer Name" FROM (**
**SELECT first_name, last_name**
**FROM customers**
**ORDER BY ctr_number DESC )**
**WHERE ROWNUM <= 3;**

```
1   SELECT first_name || ' ' || last_name AS "Customer Name" FROM (
2   SELECT first_name, last_name
3   FROM customers
4   ORDER BY ctr_number DESC )
5   WHERE ROWNUM <= 3;
```

Results | Explain | Describe | Saved SQL | History

| Customer Name |
| --- |
| Brian Rogers |
| Maria Galant |
| Andrew Murcia |

3 rows returned in 0.03 seconds Download

**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.

**SELECT first_name AS "First Name", last_name AS "Last Name", commission_rate AS "Commision Rate" FROM sales_representatives**
**WHERE commission_rate= :commission_rate**
**ORDER BY last_name;**