



Faculty of Computing

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SECD2523-08 : DATABASE

**Lab 3: DML 2**

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

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

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

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

1. customers.

SQL Worksheet

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

CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEM_ID	LOYALTY_CARD_NUMBER
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	-
c02001	brianrog@hoootech.com	Brian	Rogers	01654564898	50	-	-	lc4587

2. teams

## SQL Worksheet

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

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

3. items

## SQL Worksheet

```
1 v SELECT *  
2 FROM items;
```

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 baseball bat	equipment	-	-	il010230128

## Part 2: Selecting Specific Columns

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

### SQL Worksheet

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

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
c00103	Andrew	Murcia	MurciaA@globaltech.com	07715246890
c01986	Maria	Galant	margal87@delphiview.com	01442736589
c02001	Brian	Rogers	brianrog@hootech.com	01654564898

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

### SQL Worksheet

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

NAME	NUMBER_OF_PLAYERS
Rockets	25
Celtics	42
Rovers	8
Jets	10

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

SQL Worksheet

1

SELECT name, description, category

2

FROM items;

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 baseball bat	equipment

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

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

#### 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.

[illegible] Clear

Find

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

FIRST_NAME	LAST_NAME	CURRENT_BALANCE	CURRENT_BALANCE/12
Robert	Thornberry	150	12.5
Jennifer	Jones	0	0
John	Doe	987.5	82.291666666666666666666666666667
Andrew	Murcia	85	7.08333333333333333333333333333333
Maria	Galant	125.65	10.47083333333333333333333333333333
Brian	Rogers	50	4.16666666666666666666666666666667

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.



SQL Worksheet					Clear
<pre> 1 v SELECT first_name, last_name, ctr_number, current_balance, current_balance-5 2   FROM customers; 3 </pre>					
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	
Andrew	Murcia	c00103	85	80	
Maria	Galant	c01986	125.65	120.65	
Brian	Rogers	c02001	50	45	

- What would be the problem with implementing this scheme?

The current\_balance cannot be zero

## Part 2 : Using Column Aliases

- You previously wrote a query that displayed 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).

[illegible]

## 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 aliases.

**SQL Worksheet** Clear Find

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

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.

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

The value contains zero, which means it doesn't have a discount.

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

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

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

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

**SQL Worksheet**

```

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

```

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	-

- 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.

**SQL Worksheet** Clear

```

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

```

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

- 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.

## SQL Worksheet

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

Order ID	Date	Order Time
or0101250	17-APR-17	08:32:30
or0101350	24-MAY-17	10:30:35
or0101425	28-MAY-17	12:30:00
or0101681	02-JUN-17	14:55:30
or0101750	18-JUN-17	09:05:00

## 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.

**SQL Worksheet**

```
1 v SELECT id AS "Inventory ID",  
2    cost,  
3    units AS "Number of units"  
4    FROM inventory_list  
5    WHERE cost BETWEEN 3.00 AND 15.00;
```

Inventory ID	COST	Number of 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.

## SQL Worksheet

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

Inventory ID	COST	Number of 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.

## SQL Worksheet

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

Inventory ID	COST	Number of 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.



SQL Worksheet

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

Item Number	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

**SQL Worksheet**

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

Item Number	NAME
im01101046	socks

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

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

#### 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.

**SQL Worksheet**

Clear

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

Team Information
TheRovers team has 8 players and does not receive a discount.

- 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.

**SQL Worksheet**

ClearFind

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

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 10 percent.
The Jets team has 10 players and receives a discount of 10 percent.

## 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.

SQL Worksheet

Clear

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

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.

SQL Worksheet

Clear

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

Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	LP89JHK
c00001	63 Acacia Drive	LP83JHR

#### 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.

SQL Worksheet

Clear

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

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)

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

## SQL Worksheet

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

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.



**SQL Worksheet**

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

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.

**SQL Worksheet**

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

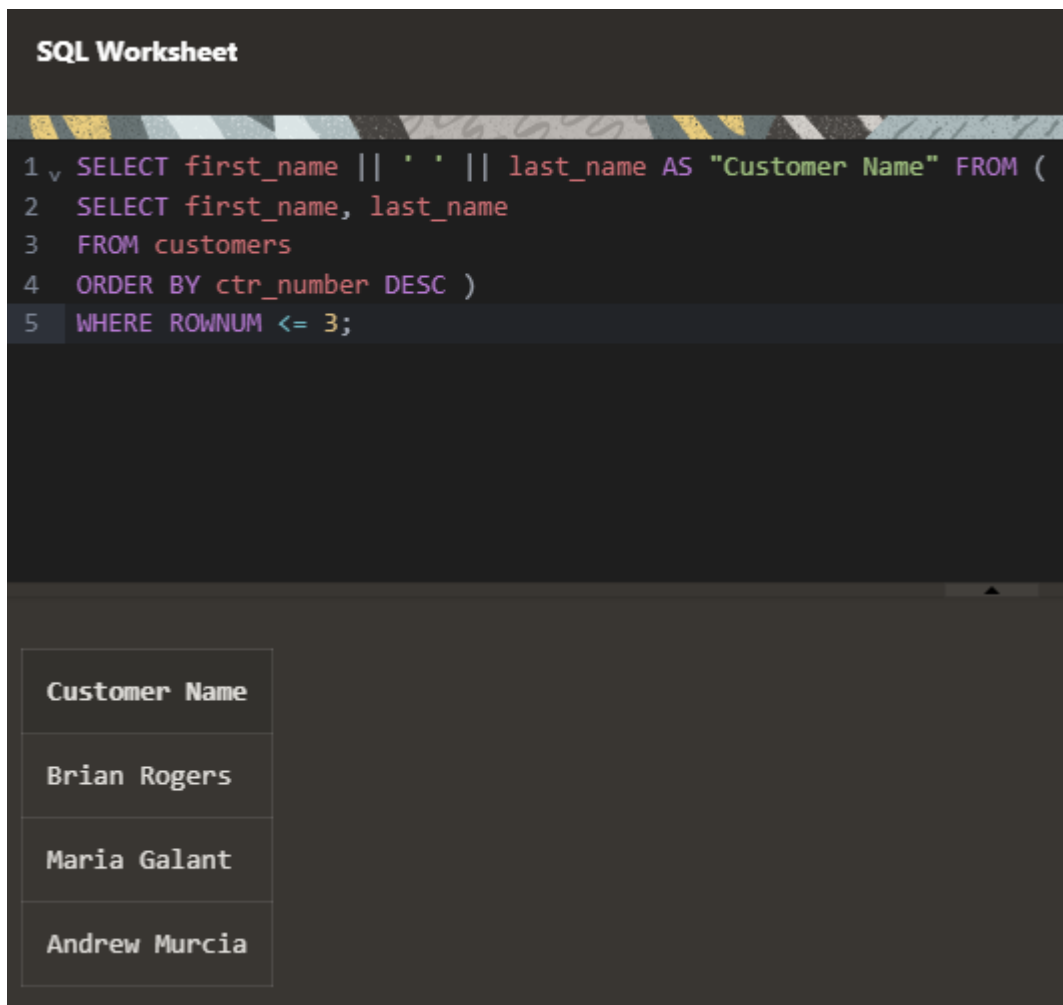
Team Name	Number of Players
Rovers	8
Rockets	25
Jets	10
Celtics	42

## 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.



The screenshot shows an SQL Worksheet interface. At the top, the title "SQL Worksheet" is displayed. Below the title is a decorative horizontal bar with a pattern of yellow, black, and grey. The main area contains a SQL query with line numbers 1 through 5 on the left. The query is:   
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;   
Below the query editor, the results are displayed in a table with a single column titled "Customer Name". The table contains three rows of data: "Brian Rogers", "Maria Galant", and "Andrew Murcia".


```
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;
```

Customer Name
Brian Rogers
Maria Galant
Andrew Murcia

## 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.

## SQL Worksheet

 Clear

```
1 ✓ SELECT first_name AS "First Name", last_name AS "Last Name", commission_rate
2   AS "Commision Rate" FROM sales_representatives
3 WHERE commission_rate= 5
4 ORDER BY last_name;
```

First Name	Last Name	Commision Rate
Barry	Speed	5
Victoria	Wright	5