

Name: Sarthak Jain

Programme: B.Tech CSE (Spec. AI&ML) (Batch 5)

Course: Advanced Database Management Systems

LAB 7

Title: To understand the concepts of Index.

Objective: Students will be able to implement the concept of index.

0. Create a table of table name: EMPLOYEES and add 6 rows

Column Name	Data Type	Width	Attributes
Employee_id	character	10	PK
First_Name	character	30	NN
Last_Name	character	30	NN
DOB	date	-	-
Salary	number	25	NN
Department_id	character	10	-

Ans.0

```
CREATE TABLE EMPLOYEES(  
    Employee_id VARCHAR(10) PRIMARY KEY,  
    First_Name VARCHAR(30) NOT NULL,  
    Last_Name VARCHAR(30) NOT NULL,  
    DOB DATE,  
    Salary INTEGER NOT NULL,  
    Department_id VARCHAR(10) NOT NULL  
);
```

```
INSERT INTO EMPLOYEES (Employee_id, First_Name, Last_Name, DOB, Salary, Department_id)  
VALUES ('0x23487', 'Ravi', 'Kumar', to_date('05-12-1998', 'dd-mm-yyyy'), 50000, '0x34543');
```

```
INSERT INTO EMPLOYEES (Employee_id, First_Name, Last_Name, DOB, Salary, Department_id)  
VALUES ('1x33558', 'Mohan', 'Sharma', to_date('23-08-1997', 'dd-mm-yyyy'), 80000,  
'1x34543');
```

```
INSERT INTO EMPLOYEES (Employee_id, First_Name, Last_Name, DOB, Salary, Department_id)  
VALUES ('1x83497', 'Rohit', 'Verma', to_date('24-02-1995', 'dd-mm-yyyy'), 120000, '0x34543');
```

```
INSERT INTO EMPLOYEES (Employee_id, First_Name, Last_Name, DOB, Salary, Department_id)
VALUES ('0x89437', 'Jim', 'Halpert', to_date('21-03-1998', 'dd-mm-yyyy'), 30000, '1x34543');
```

```
INSERT INTO EMPLOYEES (Employee_id, First_Name, Last_Name, DOB, Salary, Department_id)
VALUES ('0x22423', 'Shyam', 'Sharma', to_date('24-02-1989', 'dd-mm-yyyy'), 60000,
'0x34543');
```

```
INSERT INTO EMPLOYEES (Employee_id, First_Name, Last_Name, DOB, Salary, Department_id)
VALUES ('0x83489', 'Pallavi', 'Kumari', to_date('09-08-1998', 'dd-mm-yyyy'), 55000,
'1x34543');
```

Live SQL

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SQL Worksheet

ClearFindActionsSaveRun

1SELECT * FROM EMPLOYEES;

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	DOB	SALARY	DEPARTMENT_ID
1x33558	Mohan	Sharma	23-AUG-97	80000	1x34543
1x83497	Rohit	Verma	24-FEB-95	120000	0x34543
0x89437	Jim	Halpert	21-MAR-98	30000	1x34543
0x22423	Shyam	Sharma	24-FEB-89	60000	0x34543
0x83489	Pallavi	Kumari	09-AUG-98	55000	1x34543
0x23487	Ravi	Kumar	05-DEC-98	50000	0x34543

Download CSV6 rows selected.

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1. Execute the following index related queries:

1.1 Create an index of name employee_idx on EMPLOYEES with column Last_Name, Department_id

Ans.1.1.

```
CREATE INDEX employee_idx  
ON employees (last_name, department_id);
```

The screenshot displays the Live SQL web interface. At the top, there's a dark header with the 'Live SQL' logo, a 'Feedback' button, a 'Help' button, and a user profile icon for 'thelazycrazywizard@gmail.com'. Below the header, the main area is titled 'SQL Worksheet'. It features a code editor with three lines of SQL: a comment, 'CREATE INDEX employee_idx', and 'ON employees (last_name, department_id);'. To the right of the editor are buttons for 'Clear', 'Find', 'Actions', 'Save', and a green 'Run' button. Below the code editor, a message box displays 'Index created.' The footer contains the Oracle logo, 'Integrated Cloud Applications & Platform Services', copyright information for 2020, and links to Oracle Learning Library, Ask Tom, Dev Gym, and Database Doc 19c, 18c, 12c. It also mentions 'Live SQL 20.3.1, running Oracle Database 19c Enterprise Edition - 19.8.0.0.0' and 'Built with ❤️ using Oracle APEX'.

Live SQL

Feedback Help thelazycrazywizard@gmail.com

SQL Worksheet Clear Find Actions Save Run

```
1 -- Create an index of name employee_idx on EMPLOYEES with column Last_Name, Department_id
2 CREATE INDEX employee_idx
3 ON employees (last_name, department_id);
```

Index created.

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Ans.1.2.

[illegible]

1.3 Create a reverse index on employee_id column of the EMPLOYEES.

Ans.1.3.

```
CREATE INDEX emp_idx_rev  
ON employees(employee_id) REVERSE;
```

The screenshot displays the Oracle Live SQL web interface. The top navigation bar includes a hamburger menu, the 'Live SQL' logo, and links for Feedback, Help, and a user profile. The left sidebar contains navigation options: Home, SQL Worksheet (selected), My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main content area is titled 'SQL Worksheet' and features a code editor with the following SQL statement:

```
1 CREATE INDEX emp_idx_rev  
2 ON employees (employee_id) REVERSE;  
3
```

Below the code editor, the output area shows the message 'Index created.' The top right of the worksheet area contains buttons for Clear, Find, Actions, Save, and a Run button. The footer of the interface includes the Oracle logo, Integrated Cloud Applications & Platform Services, copyright information for 2020 Oracle Corporation, and links to the Oracle Learning Library, Ask Tom, Dev Gym, and Database Doc. It also specifies the version as Live SQL 20.3.1, running Oracle Database 19c Enterprise Edition - 19.8.0.0.0, and notes it is built with Oracle APEX.

1.4 Create a unique and composite index on employee_id and check whether there is duplicity of tuples or not.

Ans.1.4.

CREATE UNIQUE INDEX employee_id
ON employees(first_name, last_name);

The screenshot shows the Live SQL interface with the SQL Worksheet tab active. The SQL code entered is:

```
1 CREATE UNIQUE INDEX employee_id
2 ON employees(first_name, last_name);
3
```

The output area displays the message: "Index created."

At the bottom, the footer includes the Oracle logo, "Integrated Cloud Applications & Platform Services", copyright information for 2020, and links to the Oracle Learning Library, Ask Tom, Dev Gym, and Database Doc 19c, 18c, 12c. It also mentions "Live SQL 20.3.1, running Oracle Database 19c Enterprise Edition - 19.8.0.0.0" and "Built with ❤️ using Oracle APEX".

SELECT * FROM
(SELECT COUNT(ROWID) FROM employees), (SELECT COUNT(first_name) FROM employees);

The screenshot shows the Live SQL interface with the SQL Worksheet tab active. The SQL code entered is:

```
1 SELECT * FROM
2 (SELECT COUNT(ROWID) FROM employees), (SELECT COUNT(first_name) FROM employees);
3
```

The output area displays a table with two columns: COUNT(ROWID) and COUNT(FIRST_NAME). Both columns show a value of 6.

COUNT(ROWID)	COUNT(FIRST_NAME)
6	6

Below the table, there is a link to "Download CSV".

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1.5 Create Function-based indexes defined on the SQL functions UPPER(column_name) or LOWER(column_name) to facilitate case-insensitive searches(on column Last_Name).

Ans.1.5.

```
CREATE INDEX fname_lower  
ON employees (LOWER(first_name));
```

≡

Live SQL

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SQL Worksheet

Clear Find Actions Save Run

1 CREATE INDEX fname_lower
2 ON employees (LOWER(first_name));
3

Index created.

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^







1.6 Drop the function based index on column Last_Name.








Ans.1.6.

DROP INDEX fname_lower;

  **Live SQL**


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 **SQL Worksheet**  Clear  Find  Actions  Save  Run

```
1 DROP INDEX fname_lower;
2
```

Index dropped.

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