NMK20303 Database Management System LAB
MODULE 4

SQL Application

FACULTY OF ELECTRONIC ENGINEERING TECHNOLOGY Universiti

Malaysia Perlis

NMK20303 – Database Management System
LAB 4 –Advanced SQL

OBJECTIVES

1. To understand the Structured Query Language that query or data management language.
2. To use the MySQL in the application of database management system.
3. To apply the MySQL in the database application.
4. To combine result from more than one table and SQL statement.

Equipment/software

1. XAMPP Apache + MariaDB + PHP
2. Netbeans

INTRODUCTION

1. Use the previous database from Lab Module 2, modify table (**EMPLOYEE**), create new tables (**SALARY**, **JOB** and **BRANCH**) and add more data to **EMPLOYEE** and **SALARY** tables

EMPLOYEE

ID	FNAME	LNAME	BID	PHONENO	HIREDATE	JOBID	EDLEVEL	SEX	BIRTHDATE
101	HISHAM	MOHAMAD	A11	0101112233	2010-04-01	MGR	18	M	1969-10-25
121	AZIAN	IDRIS	A11	0122223344	2010-06-29	CL	10	F	1988-11-22
131	AHMAD	FIRDAUS	M22	0133334455	2010-07-20	OPR	8	M	1990-01-21
142	BADRUL	JUSOH	M22	0144445566	2007-05-19	SPR	14	M	1988-05-01
155	YANA	HARIZ	M22	0155556677	2006-01-05	OPR	12	F	1980-12-12
158	ZURIA	SAAD	B12	0127778890	2009-11-08	ACT	10	F	1986-03-11
160	DANI	IMAN	M22	0119995432	2009-08-15	OPR	10	M	1989-10-31
161	LEEN	RAZLAN	A11	0137895431	2010-02-23	CL	8	F	1978-10-25
123	MIZAR	DAHLAN	B12	0146752909	2001-01-25	MGR	18	M	1985-10-12
128	MIHAR	RUSLI	A11	0197861212	2002-10-19	CL	10	M	1987-11-11
156	EDY	HASAN	B12	0104442356	2006-01-05	OPR	8	M	1990-08-02
165	MAZIAH	RIZKI	M22	0119891231	2003-09-05	SPR	14	F	1987-05-25

SALARY

ID	BASIC	BONUS
101	4500.00	1500.00
121	1200.00	800.00
131	1000.00	850.00
142	2000.00	1000.00
155	1100.00	850.00
158	1150.00	900.00
160	1150.00	800.00
161	1050.00	800.00
123	4500.00	1500.00
128	1200.00	800.00
156	1000.00	850.00
165	2000.00	1000.00

JOB

JOBID	JOBNAME
MGR	MANAGER
CL	CLERK
OPR	OPERATOR
SPR	SUPERVISOR
ACT	OPERATOR

BRANCH

BID	BRANCHNAME
A11	Kuala Lumpur
M22	Seremban
B12	Tangkak

Part 1: Using Set Operation to Combine SQL Query

SQL Command: UNION

To combine all selected data from more than one SQL query. Basic syntax:-

```
SELECT column_name(s) FROM table1
UNION
SELECT column_name(s) FROM table1
```

For example if the column name is **JOBID**, Initially both query will return different list of **JOBID**:-

1. First query will return 12 JOBID.

MGR
CL
OPR
SPR
OPR
ACT
OPR
CL
MGR
CL
OPR
SPR

2. Second query will return 5 JOBID.

MGR
CL
OPR
SPR
ACT

3. Result of using UNION will combine both 2 query result and eliminate the repeated data.

MGR
CL
OPR
SPR
ACT

Command **UNION** also can be used to display data from two sources (table or query) which don't have any connection.

For example, if we want to list all employee number who works as "MGR" and also list all employee number that has salary between 1500.00 and 2000.00 **without any connection** we wrote:-

Syntax:
Mysql >> (SELECT ID FROM EMPLOYEE WHERE JOBID = 'MGR');

Mysql >> (SELECT ID FROM SALARY WHERE Basic>=1500.00 AND Basic <=2000.00);

Mysql >> (SELECT ID FROM EMPLOYEE WHERE ID = 'MGR') UNION
(SELECT ID FROM SALARY WHERE Basic>=1500.00 AND Basic <=2000.00) ;

Write down the output.

Set Operation Rules

SQL queries using operator such as **UNION** can only function if comply with the rules bellow:-

1. **Numbers** of columns in both queries are equal
2. **Data Type** is at the same position for both queries. Example if the first query contains two columns: first column is INTEGER Data Type and second column is CHARACTER Data Type, so the second query should have the same column, data type and position as the first column.
3. **Set operation** doesn't consider the name or contain of column in both queries, because of that we can combine more than one query from different column, as long as the number of column and data type in both queries are equal.

PART 2: SQL Command (CREATE VIEW)

A view is a virtual table that has its contents defined by SQL query. A view is not a physical table, but rather a set of instructions that returns a set of data. View is particularly useful when we want to focus on certain type of information maintained by the database. To create a view that can store one SQL command. Basix Syntax:-

CREATE VIEW < view name> **AS** < SQL query>

Syntax above, <SQL Command> represents any Query which can produce a result in SQL. <View Name > is the name for the virtual table.

When creating a view, consider the following items:-
1. A view can only be created in database in use.
2. A view can use data from another view
3. View is actually a short form of SQL query

Example if we want to create a virtual table or VIEW named SIMPLE_EMP which contains only ID, FNAME and JOBID we write:-

Syntax:
Mysql >> CREATE VIEW SIMPLE_EMP
AS
SELECT ID, FNAME as Name, JOBID as Job FROM EMPLOYEE ;

Mysql >> SELECT * FROM SIMPLE_EMP;

Write down the output.

PART 3: SQL Command (JOIN)

We use a JOIN to do SELECT which it result combing information from several table.

i. JOIN 2 tables

Syntax:
Mysql >> SELECT EMPLOYEE. ID, EMPLOYEE.FNAME,
BRANCH.BRANCHNAME
FROM EMPLOYEE INNER JOIN BRANCH
ON BRANCH.BID=EMPLOYEE.BID;

Write down the output.

ii. JOIN 3 tables

Syntax:
Mysql >> SELECT EMPLOYEE. ID, EMPLOYEE.FNAME,
BRANCH.BRANCHNAME,
SALARY.BASIC, SALARY.BONUS
FROM EMPLOYEE INNER JOIN BRANCH
ON BRANCH.BID=EMPLOYEE.BID
INNER JOIN SALARY
ON EMPLOYEE. ID=SALARY. ID;

Write down the output.

iii. JOIN 4 tables and only list employee who work as OPERATOR

Syntax:

```
Mysql >> SELECT EMPLOYEE. ID, EMPLOYEE.FNAME,
BRANCH.BRANCHNAME, JOB.JOBNAME,
SALARY.BASIC, SALARY.BONUS
FROM EMPLOYEE
INNER JOIN BRANCH
ON BRANCH.BID=EMPLOYEE.BID
INNER JOIN JOB
ON JOB.JOBID=EMPLOYEE.JOBID
INNER JOIN SALARY
ON EMPLOYEE. ID=SALARY.ID
WHERE
EMPLOYEE.JOBID='OPR';
```

Write down the output.

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Exercise

Question 1 : Create the table below in your database (You can add tables to your existing database) .

EMPLOYEE

ID	FNAME	LNAME	BID	PHONENO	HIREDATE	JOBID	EDLEVEL	SEX	BIRTHDATE
101	HISHAM	MOHAMAD	A11	0101112233	2010-04-01	MGR	18	M	1969-10-25
121	AZIAN	IDRIS	A11	0122223344	2010-06-29	CL	10	F	1988-11-22
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SALARY

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160	1150.00	800.00
161	1050.00	800.00
123	4500.00	1500.00
128	1200.00	800.00
156	1000.00	850.00
165	2000.00	1000.00

JOB

JOBID	JOBNAME
MGR	MANAGER
CL	CLERK
OPR	OPERATOR
SPR	SUPERVISOR
ACT	ACCOUNTANT

BRANCH

BID	BRANCHNAME
A11	Kuala Lumpur
M22	Seremban
B12	Tangkak

Question 2: Construct a SQL (Structured Query Language) statement to answer the following queries.

1. Create a virtual table or VIEW named VIR_INFO which contains only ID, FNAME,LNAME,PHONENO and HIREDATE

Syntax:
Output:
2. Using UNION, Create SQL statement to returns the BID from table EMPLOYEE and BRANCH

Syntax:
Output:

3. Using UNION, list all employee who works as “OPERATOR” ,SEX as MALE and also list all employee number that has salary between 800.00 and 2000.00

Syntax:
Output:

4. Using JOIN, list all the employee information except who worked as SUPERVISOR.

Syntax:
Output:

5. Using JOIN ,List all the ID, FirstName and EdLevel which salary are less than RM1000.00.
Syntax:
Output:

Question 3: Write down a simple discussion of what you have learnt from this lab session.