MID SEMESTER EXAMINATION / Project 1
Academic Year 2020 – 2021 / 2nd Semester
Subject : Database Systems
Lecturer : Zain Saifullah
Study Program: Information Technology / IT4
Date of Exam : March 8, 2021

Instructions to Students

1. This examination consist of 4 pages and 10 questions
2. Due date of this examination is **Monday March 15, 2021 13.00 PM**
3. Sanctions will be given to those students who are not following the examination rules
4. All answers to be written directly following the questions. The number to the corresponding question must be written correctly
5. This is a take home examination
6. Students are not allowed to communicate or to cooperate each other or copy someone's work while the examination is going on
7. You must submit your handwritten answer by screenshot it and inserted into word or pdf files. You also must submit screenshoot all answers (from cmd) in the same file. Your file name is YourName_YourStudentID.doc(x) or pdf

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Questions:

For Questions **2** you must submitted in a separate file (filename: YourName_YourStudentID_Part2). Due Date: **Monday March 15, 2021 13.00 PM**

1. (70 Marks) Create SQL Command which,

   a) Display the query result below.

ID	Nama	Umur	JenisKelamin	Alamat	Keanggotaan
3	Tedy	25	Male	Cikarang	2020
5	Jeni	27	Female	Jakarta	2020
4	Anwar	19	Male	Bandung	2013
2	Andriana	21	Female	Jakarta	2020

   b) Display all name, age, year of usage of members who have used the benefit in 2019 – 2021 and the status still "Valid"

   c) Display the query result below

Name	Age	Gender
Tedy	25	Male
Jeni	27	Female
Anwar	19	Male
Andriana	21	Female

d) Using JOIN or LEFT JOIN or RIGHT JOIN to display the following result

name	year	status
Tedy	2021	Valid
Andriana	2020	Valid
Andriana	2020	Valid
Tedy	2020	Valid
Andre	2014	Expired
Jeni	NULL	NULL
Anwar	NULL	NULL

e) Display name, product_of_benefit, type_of_benefit, year of usage for all members which status of usage is “Valid”

f) Using JOIN or LEFT JOIN or RIGHT JOIN to display the following result

id	product_of_benefit	type_of_benefit	how_long	id	year	id_member	id_product_of_benefit	status
4	Game Tickets	Big discount	5	5	2020	3	4	Valid
1	Memberships	Discount	2	2	2020	2	1	Valid
3	Parking Voucher	Free	1	4	2021	3	3	Valid
2	Sports Stadium	Discount	5	1	2014	1	2	Expired
2	Sports Stadium	Discount	5	3	2020	2	2	Valid

g) Insert 1 member (up to you) which addess/city is abroad (the name of city is up to you) using cmd command (**interpreter)**
Insert also 1 benefit data (up to you) which type of benefit is “Buy 1 Get 1” using cmd command (**interpreter**)
Insert also 1 usage_of_benefit (up to you) which Status is “On Process” using cmd command (**interpreter**)
And display all members which status are “On Process” or “Expired”

h) On table **member**, add a column name **study_program_id** and also **its master table** (the name of master table is up to you; for example, the column of master table is **id** and **study_program name**)

i) Show your SQL command in update one data of member (for example update data of someone’s age

j) Explain how to use SQL, in at least 2 paragraphs, starting from create database until using Query (select)

ANSWERS:

A. Display the query result.

```
MariaDB [MIDEXAM_DB]> SELECT * FROM member
    -> ORDER BY name DESC
    -> LIMIT 4;
+----+----------+------+--------+----------+--------------+
| id | name     | age  | gender | address  | member_since |
+----+----------+------+--------+----------+--------------+
|  3 | Tedy     |   25 | Male   | Cikarang |         2020 |
|  5 | Jeni     |   27 | Female | Jakarta  |         2020 |
|  4 | Anwar    |   19 | Male   | Bandung  |         2013 |
|  2 | Andriana |   21 | Female | Jakarta  |         2020 |
+----+----------+------+--------+----------+--------------+
4 rows in set (0.001 sec)
```

B. Display all name, age, year of usage of members who have used the benefit in 2019 – 2021 and the status still “Valid”.

With query DISTINCT

```
MariaDB [midexam_db]> SELECT DISTINCT m.name, m.age, uob.year, uob.status
    -> FROM usage_of_benefit AS uob
    -> JOIN member AS m ON (uob.id_member = m.id)
    -> WHERE year >= 2019 AND year <=2021 AND status = 'Valid';
+----------+------+------+--------+
| name     | age  | year | status |
+----------+------+------+--------+
| Andriana |   21 | 2020 | Valid  |
| Tedy     |   25 | 2021 | Valid  |
| Tedy     |   25 | 2020 | Valid  |
+----------+------+------+--------+
3 rows in set (0.116 sec)

MariaDB [midexam_db]>
```

Without DISTINCT

```
MariaDB [midexam_db]> SELECT m.name, m.age, uob.year, uob.status
    -> FROM usage_of_benefit AS uob
    -> JOIN member AS m ON (uob.id_member = m.id)
    -> WHERE year >= 2019 AND year <=2021 AND status = 'Valid';
+----------+------+------+--------+
| name     | age  | year | status |
+----------+------+------+--------+
| Andriana |   21 | 2020 | Valid  |
| Andriana |   21 | 2020 | Valid  |
| Tedy     |   25 | 2021 | Valid  |
| Tedy     |   25 | 2020 | Valid  |
+----------+------+------+--------+
4 rows in set (0.002 sec)
```

C. Display the query result.

```
MariaDB [midexam_db]> SELECT name, age, gender FROM member
    -> ORDER BY name DESC
    -> LIMIT 4;
+----------+------+--------+
| name     | age  | gender |
+----------+------+--------+
| Tedy     |   25 | Male   |
| Jeni     |   27 | Female |
| Anwar    |   19 | Male   |
| Andriana |   21 | Female |
+----------+------+--------+
4 rows in set (0.002 sec)
```

D. First, we must insert new *id_member* in the table of *usage_of_benefit.*

```
MariaDB [midexam_DB]> INSERT INTO usage_of_benefit(id_member)
    -> VALUES(5),(4);
Query OK, 2 rows affected (0.059 sec)
Records: 2  Duplicates: 0  Warnings: 0

MariaDB [midexam_DB]> SELECT * FROM usage_of_benefit;
+----+------+-----------+-----------------------+---------+
| id | year | id_member | id_product_of_benefit | status  |
+----+------+-----------+-----------------------+---------+
|  1 | 2014 |         1 |                     2 | Expired |
|  2 | 2020 |         2 |                     1 | Valid   |
|  3 | 2020 |         2 |                     2 | Valid   |
|  4 | 2021 |         3 |                     3 | Valid   |
|  5 | 2020 |         3 |                     4 | Valid   |
|  6 | NULL |         5 |                  NULL | NULL    |
|  7 | NULL |         4 |                  NULL | NULL    |
+----+------+-----------+-----------------------+---------+
7 rows in set (0.001 sec)
```

Then, we can select name, year, status, and display the query result.

```
MariaDB [midexam_DB]> SELECT m.name, uob.year, uob.status
    -> FROM usage_of_benefit AS uob
    -> JOIN member AS m ON(uob.id_member = m.id)
    -> ORDER BY uob.year DESC, m.name ASC;
+----------+------+---------+
| name     | year | status  |
+----------+------+---------+
| Tedy     | 2021 | Valid   |
| Andriana | 2020 | Valid   |
| Andriana | 2020 | Valid   |
| Tedy     | 2020 | Valid   |
| Andre    | 2014 | Expired |
| Anwar    | NULL | NULL    |
| Jeni     | NULL | NULL    |
+----------+------+---------+
7 rows in set (0.059 sec)

MariaDB [midexam_DB]>
```

E. Display name, product_of_benefit, type_of_benefit, year of usage for all members which status of usage is “Valid”

```
MariaDB [midexam_DB]> SELECT DISTINCT m.name,b.product_of_benefit,b.type_of_benefit,uob.year,uob.status
    -> FROM usage_of_benefit AS uob
    -> JOIN member AS m ON(uob.id_member = m.id)
    -> JOIN benefit AS b ON(uob.id_product_of_benefit = b.id)
    -> WHERE status = 'Valid';
+----------+--------------------+-----------------+------+--------+
| name     | product_of_benefit | type_of_benefit | year | status |
+----------+--------------------+-----------------+------+--------+
| Andriana | Memberships        | Discount        | 2020 | Valid  |
| Andriana | Sport Stadium      | Discount        | 2020 | Valid  |
| Tedy     | Parking Voucher    | Free            | 2021 | Valid  |
| Tedy     | Game Tickets       | Big Discount    | 2020 | Valid  |
+----------+--------------------+-----------------+------+--------+
4 rows in set (0.002 sec)

MariaDB [midexam_DB]>
```

F. Display the result

```
MariaDB [midexam_DB]> SELECT *
    -> FROM benefit AS b
    -> JOIN usage_of_benefit AS uob ON(uob.id_product_of_benefit = b.id)
    -> ORDER BY product_of_benefit ASC;
+----+--------------------+-----------------+----------+----+------+-----------+----------------------+---------+
| id | product_of_benefit | type_of_benefit | how_long | id | year | id_member | id_product_of_benefit | status  |
+----+--------------------+-----------------+----------+----+------+-----------+----------------------+---------+
|  4 | Game Tickets       | Big Discount    |        5 |  5 | 2020 |         3 |                    4 | Valid   |
|  1 | Memberships        | Discount        |        2 |  2 | 2020 |         2 |                    1 | Valid   |
|  3 | Parking Voucher    | Free            |        1 |  4 | 2021 |         3 |                    3 | Valid   |
|  2 | Sport Stadium      | Discount        |        5 |  1 | 2014 |         1 |                    2 | Expired |
|  2 | Sport Stadium      | Discount        |        5 |  3 | 2020 |         2 |                    2 | Valid   |
+----+--------------------+-----------------+----------+----+------+-----------+----------------------+---------+
5 rows in set (0.003 sec)

MariaDB [midexam_DB]>
```

G. Insert 1 **member** (up to you) which address/city is abroad (the name of city is up to you) using cmd command (interpreter)

```
MariaDB [midexam_DB]> INSERT INTO member(id, name, age, gender, address, member_since)
    -> VALUES ('','Celine',19,'Female','New York',2017);
Query OK, 1 row affected, 1 warning (0.180 sec)

MariaDB [midexam_db]> SELECT * FROM member;
+----+----------+------+--------+----------+--------------+
| id | name     | age  | gender | address  | member_since |
+----+----------+------+--------+----------+--------------+
|  1 | Andre    |   23 | Male   | Cikarang |         2010 |
|  2 | Andriana |   21 | Female | Jakarta  |         2020 |
|  3 | Tedy     |   25 | Male   | Cikarang |         2020 |
|  4 | Anwar    |   19 | Male   | Bandung  |         2013 |
|  5 | Jeni     |   27 | Female | Jakarta  |         2020 |
|  6 | Celine   |   19 | Female | New York |         2017 |
+----+----------+------+--------+----------+--------------+
6 rows in set (0.001 sec)

MariaDB [midexam_db]>
```

Insert also 1 **benefit** data (up to you) which type of benefit is “Buy 1 Get 1” using cmd command (interpreter)

```
MariaDB [midexam_DB]> INSERT INTO benefit(id, product_of_benefit, type_of_benefit, how_long)
    -> VALUES ('','Snacks','Buy 1 Get 1',3);
Query OK, 1 row affected, 1 warning (0.089 sec)
MariaDB [midexam_db]> SELECT * FROM benefit;
+----+--------------------+-----------------+----------+
| id | product_of_benefit | type_of_benefit | how_long |
+----+--------------------+-----------------+----------+
|  1 | Memberships        | Discount        |        2 |
|  2 | Sport Stadium      | Discount        |        5 |
|  3 | Parking Voucher    | Free            |        1 |
|  4 | Game Tickets       | Big Discount    |        5 |
|  5 | Snacks             | Buy 1 Get 1     |        3 |
+----+--------------------+-----------------+----------+
5 rows in set (0.029 sec)
```

Insert also 1 **usage_of_benefit** (up to you) which Status is “On Process” using cmd command (interpreter)

```
MariaDB [midexam_DB]> INSERT INTO usage_of_benefit(id, year, id_member, id_product_of_benefit, status)
    -> VALUES("",2019,4,5,'On Process');
Query OK, 1 row affected, 1 warning (0.126 sec)

MariaDB [midexam_DB]>

MariaDB [midexam_db]> SELECT * FROM usage_of_benefit;
+----+------+-----------+-----------------------+------------+
| id | year | id_member | id_product_of_benefit | status     |
+----+------+-----------+-----------------------+------------+
|  1 | 2014 |         1 |                     2 | Expired    |
|  2 | 2020 |         2 |                     1 | Valid      |
|  3 | 2020 |         2 |                     2 | Valid      |
|  4 | 2021 |         3 |                     3 | Valid      |
|  5 | 2020 |         3 |                     4 | Valid      |
|  6 | 2019 |         4 |                     5 | On Process |
+----+------+-----------+-----------------------+------------+
6 rows in set (0.040 sec)

MariaDB [midexam_db]>
```

And display all **members** which status are “On Process” or “Expired”

```
MariaDB [midexam_DB]> SELECT *
    -> FROM member AS m
    -> JOIN usage_of_benefit AS uob ON(uob.id_member = m.id)
    -> WHERE status = 'On Process' OR status = 'Expired';
+----+-------+------+--------+---------+-------------+----+------+-----------+-----------------------+------------+
| id | name  | age  | gender | address | member_since | id | year | id_member | id_product_of_benefit | status     |
+----+-------+------+--------+---------+-------------+----+------+-----------+-----------------------+------------+
|  1 | Andre |   23 | Male   | Cikarang |        2010 |  1 | 2014 |         1 |                     2 | Expired    |
|  4 | Anwar |   19 | Male   | Bandung  |        2013 |  8 | 2019 |         4 |                     5 | On Process |
+----+-------+------+--------+---------+-------------+----+------+-----------+-----------------------+------------+
2 rows in set (0.002 sec)

MariaDB [midexam_DB]>
```

H. On table member, add a column name study_program_id and also its master table (the name of master table is up to you; for example, the column of master table is id and study_program name)

- Add new column in the *member's table* = study_program_id

```
MariaDB [midexam_DB]> ALTER TABLE member
    -> ADD study_program_id INT NOT NULL;
Query OK, 0 rows affected (0.754 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [midexam_DB]> DESC member;
+------------------+-------------+------+-----+---------+----------------+
| Field            | Type        | Null | Key | Default | Extra          |
+------------------+-------------+------+-----+---------+----------------+
| id               | int(11)     | NO   | PRI | NULL    | auto_increment |
| name             | varchar(100)| NO   |     | NULL    |                |
| age              | int(11)     | YES  |     | NULL    |                |
| gender           | varchar(100)| YES  |     | NULL    |                |
| address          | varchar(100)| YES  |     | NULL    |                |
| member_since     | int(11)     | YES  |     | NULL    |                |
| study_program_id | int(11)     | NO   |     | NULL    |                |
+------------------+-------------+------+-----+---------+----------------+
7 rows in set (0.034 sec)
```

- Create new table *"Master"* and add column = id, study_program_name

```
MariaDB [midexam_DB]> CREATE TABLE master(
    -> id INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
    -> study_program_name VARCHAR(100) NOT NULL);
Query OK, 0 rows affected (0.244 sec)

MariaDB [midexam_DB]> DESC master;
+--------------------+-------------+------+-----+---------+----------------+
| Field              | Type        | Null | Key | Default | Extra          |
+--------------------+-------------+------+-----+---------+----------------+
| id                 | int(11)     | NO   | PRI | NULL    | auto_increment |
| study_program_name | varchar(100)| NO   |     | NULL    |                |
+--------------------+-------------+------+-----+---------+----------------+
2 rows in set (0.016 sec)

MariaDB [midexam_DB]> INSERT INTO master(study_program_name)
    -> VALUES ('Information Technology'),('Information System'),('Communication Visual Design');
Query OK, 3 rows affected (0.083 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [midexam_DB]> SELECT * FROM master;
+----+----------------------------+
| id | study_program_name         |
+----+----------------------------+
|  1 | Information Technology     |
|  2 | Information System         |
|  3 | Communication Visual Design|
+----+----------------------------+
3 rows in set (0.005 sec)
```

- Relationship between Master's table and Member's table.

```
MariaDB [midexam_DB]> ALTER TABLE member
    -> ADD CONSTRAINT fk_member_master
    -> FOREIGN KEY(study_program_id) REFERENCES master (id);
Query OK, 6 rows affected (1.752 sec)
Records: 6  Duplicates: 0  Warnings: 0

MariaDB [midexam_DB]> DESC member;
+-----------------+-------------+------+-----+---------+----------------+
| Field           | Type        | Null | Key | Default | Extra          |
+-----------------+-------------+------+-----+---------+----------------+
| id              | int(11)     | NO   | PRI | NULL    | auto_increment |
| name            | varchar(100)| NO   |     | NULL    |                |
| age             | int(11)     | YES  |     | NULL    |                |
| gender          | varchar(100)| YES  |     | NULL    |                |
| address         | varchar(100)| YES  |     | NULL    |                |
| member_since    | int(11)     | YES  |     | NULL    |                |
| study_program_id| int(11)     | NO   | MUL | NULL    |                |
+-----------------+-------------+------+-----+---------+----------------+
7 rows in set (0.022 sec)

MariaDB [midexam_DB]> SELECT m.name, m.age, m.gender, ms.study_program_name
    -> FROM member AS m
    -> JOIN master AS ms ON(m.study_program_id = ms.id);
+---------+------+--------+---------------------------+
| name    | age  | gender | study_program_name        |
+---------+------+--------+---------------------------+
| Andre   |   23 | Male   | Information Technology    |
| Andriana|   21 | Female | Information System        |
| Tedy    |   25 | Male   | Information System        |
| Anwar   |   19 | Male   | Information Technology    |
| Jeni    |   27 | Female | Information Technology    |
| Celine  |   19 | Female | Communication Visual Design |
+---------+------+--------+---------------------------+
6 rows in set (0.060 sec)

MariaDB [midexam_DB]>
```

I. Show your SQL command in update one data of **member** (for example update data of someone's age.

```
MariaDB [midexam_DB]> UPDATE member SET
    -> age = 19,
    -> address = 'Surabaya'
    -> WHERE id=1;
Query OK, 1 row affected (0.094 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [midexam_DB]>

3 rows in set (0.004 sec)

MariaDB [midexam_db]> SELECT * FROM member;
+----+----------+------+--------+----------+--------------+
| id | name     | age  | gender | address  | member_since |
+----+----------+------+--------+----------+--------------+
|  1 | Andre    |   19 | Male   | Surabaya |         2010 |
|  2 | Andriana |   21 | Female | Jakarta  |         2020 |
|  3 | Tedy     |   25 | Male   | Cikarang |         2020 |
|  4 | Anwar    |   19 | Male   | Bandung  |         2013 |
|  5 | Jeni     |   27 | Female | Jakarta  |         2020 |
|  6 | Celine   |   19 | Female | New York |         2017 |
+----+----------+------+--------+----------+--------------+
6 rows in set (0.068 sec)
```

J. Explain how to use SQL. Starting from create database until using Query (select)…

The MySQL program is the most commonly used client program for performing database administration as well as writing queries and displaying the results. The MySQL program also functions to send SQL commands from the client to the database server. Here, I will explain how to run the MySQL program. First, open cmd and make sure the XAMPP control panel is running, write the command *mysql -u (user name) –p* fill in the password according to the user name selected using the root user.

If we want to create a new database, then use the command *CREATE DATABASE new_database;* Do not forget to put a semicolon (;) at the end of the query. This command will create a new database with the name "new_database". Display the database on the MySQL server with the command *SHOW DATABASES;* Select the database you want to use using the USE command, for example: *USE new_database;* This command will select database new_database as an active database or ready to use. If we are already using USE, then we can perform commands to the MySQL server, both for writing queries, doing data backup and restore, as well as other administrative tasks. Example (SELECT * FROM member;) means to display all data from the member table, and (SOURCE filename; or SOURCE C: /file.sql) to execute commands stored in file.sql by the compiler.

In the MySQL program, every statement or new statement must end with a terminator. Terminator is a sign used to declare the end of a command. One example of a terminator that is often used is (;) semicolon. The MySQL program can also access help information or MySQL Reference Manual on the MySQL server. The general form of using the HELP command is an example of HELP contents; namely to display the table of contents from the MySQL manual. When we have finished using MySQL, write the *EXIT* command to exit the program.