PRACTICE REPORT

WEB PROGRAMMING LAB WORKS

MODULE 4

“SQL (Structured Query Language)”

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X

PROGRAM STUDI TEKNIK INFORMATIKA

FAKULTAS KOMUNIKASI DAN INFORMATIKA

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PRACTICE

1. **Experiment 1 (Creating a Database)**

Run SQL query/queries on server “localhost”:

```
1 CREATE DATABASE informatika
```

Picture 1.1 The Code.

(Explanation)

The **CREATE DATABASE INFORMATIKA;** command in SQL is used to create a new database named **INFORMATIKA** in a database management system (DBMS) such as MySQL or PostgreSQL

Picture 1.2 The Output.

2. **Experiment 2 (Creating a Table)**

Run SQL query/queries on server “localhost”:

```
1 CREATE TABLE Student (
2     NIM varchar(10) PRIMARY KEY NOT NULL,
3     Name char(50)NULL,
4     Class char(5)NULL,
5     Address char(10)NULL
6 )
```

Picture 2.1 the code.

(Explanation)
The SQL command **CREATE TABLE Student**creates a table named **student**with four columns: **NIM** (VARCHAR(10) PRIMARY KEY NOT NULL) as the unique identifier for each student, **Name** (CHAR(50) NULL), **Class** (CHAR(5) NULL), and **Address** (CHAR(50) NULL)

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
☐	1	**NIM** 🔑	varchar(10)	utf8mb4_0900_ai_ci		No	*None*			Change Drop More
☐	2	**Name**	char(50)	utf8mb4_0900_ai_ci		Yes	*NULL*			Change Drop More
☐	3	**Class**	char(5)	utf8mb4_0900_ai_ci		Yes	*NULL*			Change Drop More
☐	4	**Address**	char(10)	utf8mb4_0900_ai_ci		Yes	*NULL*			Change Drop More

Picture 2.2 the output.

3. Experiment 3 (Entering Data)

Run SQL query/queries on database informatika:

```
1 INSERT INTO student VALUES ('L200080001','Ari Wibowo','A','Solo')
```

Run SQL query/queries on database informatika:

```
1 SELECT * FROM student
```

Picture 3.1 the code 1.

Run SQL query/queries on database informatika:

```
1 INSERT INTO student (NIM, Name, Class) VALUES ('L200080080','Agustina','B')
```

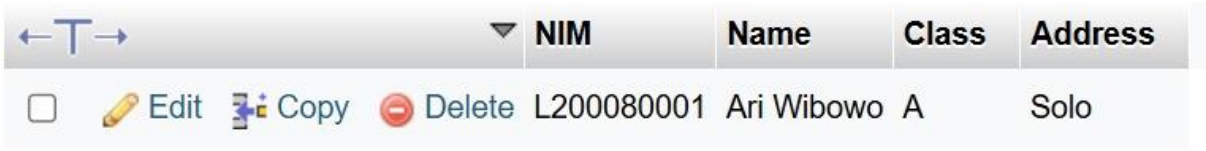
Run SQL query/queries on database informatika:

```
1 SELECT * FROM student
```

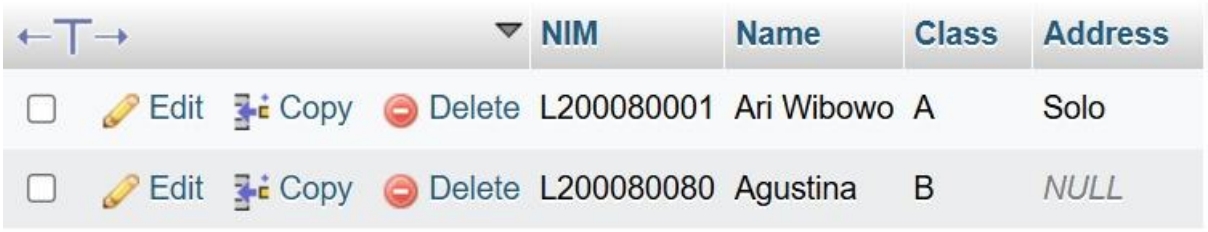
Picture 3.2 the code 2.

(Explanation)
Picture 3.1 : The SQL statement **INSERT INTO Student VALUES ('L200080001', 'Ari Wibowo', 'A', 'Solo');** inserts a new record into the **student** table with **NIM** as 'L200080001', **Name** as 'Ari Wibowo', **Class** as 'A', and **Address** as 'Solo'

Picture 3.2 : The SQL command **INSERT INTO student (NIM, Name, Class) VALUES ('L200080080', 'Agustina', 'B');** inserts a new record into the student table within the informatika database, assigning 'L200080080' to NIM, 'Agustina' to Name, and 'B' to Class, but since Name and Class are reserved keywords in SQL

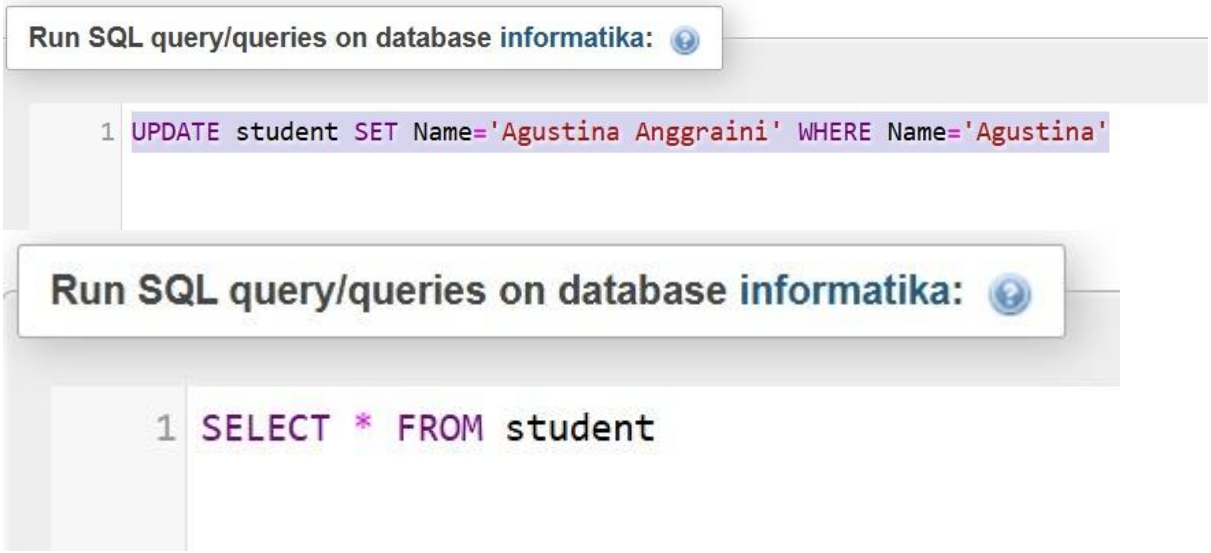


Picture 3.3 the output 1.



Picture 3.4 the output 2.

4. **Experiment 4(Changing Data)**



Picture 4.1 the code.

(Explanation)
he SQL command **UPDATE student SET Name='Agustina Anggraini' WHERE Name='Agustina';** updates the **Name** column in the **student** table within the **informatika** database, changing the value **'Agustina'** to **'Agustina Anggraini'.**

←T→	NIM	Name	Class	Address
Edit Copy Delete	L200080001	Ari Wibowo	A	Solo
Edit Copy Delete	L200080080	Agustina Anggraini	B	*NULL*

Picture 4.2 the output.

JOIN

Run SQL query/queries on database informatika:

```
1 CREATE TABLE Grade(
2     NIM varchar(10)PRIMARY KEY NOT NULL,
3     Nama_MK char(50)NULL,
4     Nilai_Angka int(5)NULL,
5     Nilai_Huruf char(3)NULL
6 )
```

Run SQL query/queries on database informatika:

```
1 INSERT INTO grade VALUES
2 ('L200080002','Kapita Selekta',60,'BC'),
3 ('L200080010','Pemrograman Web',87,'A'),
4 ('L200080080','Pemrograman Web',90,'A');
```

Run SQL query/queries on database informatika:

```
1 SELECT * from grade
```

	NIM	Nama_MK	Nilai_Angka	Nilai_Huruf
Edit Copy Delete	L200080002	Kapita Selekta	60	BC
Edit Copy Delete	L200080010	Pemrograman Web	87	A
Edit Copy Delete	L200080080	Pemrograman Web	90	A

Create table grade, then content the table, and show results.

5. **Attempt 5 (Join)**

Picture 5.1 the code.

(Explanation)
The SQL query **SELECT student.NIM, student.Name, grade.Nama_MK, grade.Nilai_Angka, grade.Nilai_Huruf FROM student JOIN grade ON student.NIM = grade.NIM;** retrieves student data from the **student** and **grade** tables within the **informatika** database, linking them using **NIM** as a common key.

NIM	Name	Nama_MK	Nilai_Angka	Nilai_Huruf
L200080080	Agustina Anggraini	Pemrograman Web	90	A

Picture 5.2 the output.

6. **Percobaan 6 (Left Join)**

Picture 6.1 the code.

(Explanation)
The SQL query **SELECT student.NIM, student.Name, grade.Nama_MK, grade.Nilai_Angka, grade.Nilai_Huruf FROM student LEFT JOIN grade ON student.NIM = grade.NIM;** retrieves all students from the **student** table and any matching records from the **grade** table, ensuring students without grades are still included.

NIM	Name	Nama_MK	Nilai_Angka	Nilai_Huruf
L200080001	Ari Wibowo	*NULL*	*NULL*	*NULL*
L200080080	Agustina Anggraini	Pemrograman Web	90	A

Picture 6.2 the output.

7. **Percobaan 7 (Right Join)**

Picture 7.1 the code.

(Explanation)
he SQL query **SELECT student.NIM, student.Name, grade.Nama_MK, grade.Nilai_Angka, grade.Nilai_Huruf FROM student RIGHT JOIN grade ON student.NIM = grade.NIM;** retrieves all records from the **grade** table and any matching records from the **student** table, ensuring all grades are displayed even if no corresponding student exists.

NIM	Name	Nama_MK	Nilai_Angka	Nilai_Huruf
NULL	*NULL*	Kapita Selekta	60	BC
NULL	*NULL*	Pemrograman Web	87	A
L200080080	Agustina Anggraini	Pemrograman Web	90	A

Picture 7.2 the output.

8. **Trial 8 (AVG Function)**

Picture 8.1 the code.

(Explanation)
Calculate the average grade from the grade table

Average Value
79.0000

Picture 8.2 the output.

9. Experiment 9 (SUM Function)

Run SQL query/queries on database informatika:

```
1 SELECT SUM(Nilai_Angka) 'Total Value' FROM grade
```

Picture 9.1 the code.

(Explanation)
sums up all the number values in the grade table

Total Value
237

Picture 9.2 the output.

10. Experiment 10 (View)

Run SQL query/queries on database informatika:

```
1 CREATE VIEW KHS AS SELECT student.NIM, grade.Nama_MK, grade.Nilai_Angka, grade.Nilai_Huruf FROM (student INNER JOIN grade ON student.NIM = grade.NIM)
```

Run SQL query/queries on database informatika:

```
1 SELECT * FROM khs
```

khs

Picture 10.1 the code.

(Explanation)
The SQL query creates a view called KHS, which contains student data and their grades by using an INNER JOIN between the student and grade tables, so that it only displays students who have grades.

	NIM	Nama_MK	Nilai_Angka	Nilai_Huruf
Edit Copy Delete	L200080080	Pemrograman Web	90	A

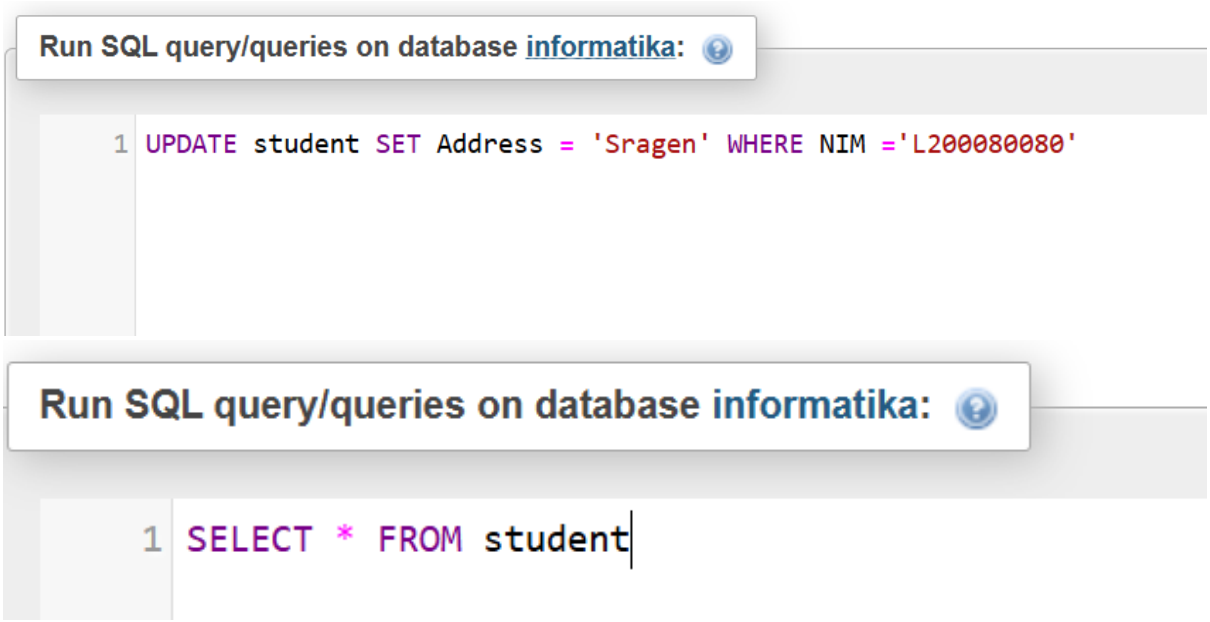
Picture 10.2 the output.

ASSIGNMENT

1. **What are the functions of the following things:**

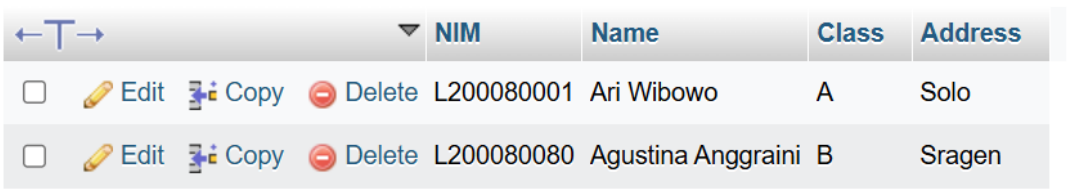
   - SELECT = Used to retrieve data from a table in the database.
   - JOIN = Used to combine two tables based on a related column.
   - LEFT JOIN = Returns all data from the left table and the matching data from the right table. If there is no match, the result from the right table will be NULL.
   - RIGHT JOIN = Returns all data from the right table and the matching data from the left table. If there is no match, the result from the left table will be NULL.
   - AVG = Calculates the average value of a numeric column.
   - SUM = Calculates the total value of a numeric column.

2. **Write SQL syntax to fill in the "Sragen" address data in the Student table (Experiment 3) in L200080080.**



Picture assigment 2.1 the code

(Explanation)
This SQL query updates the address of the student with NIM 'L200080080' in the student table, changing it to 'Sragen'.



		NIM	Name	Class	Address
☐	Edit Copy Delete	L200080001	Ari Wibowo	A	Solo
☐	Edit Copy Delete	L200080080	Agustina Anggraini	B	Sragen

Picture Assigments 2.2 the output.