

Praktikum 8

A. Praktikum

1	Relationship <p>Buat database nama_kantor (isi dengan nama anda)</p> <pre>MariaDB [(none)]> create database mayang_kantor; Query OK, 1 row affected (0.00 sec)</pre> <p>Buat tabel karyawan dan tabel departemen dengan struktur sebagai berikut:</p> <pre>MariaDB [(none)]> use mayang_kantor Database changed MariaDB [mayang_kantor]> create table karyawan(-> nama varchar (30) NOT NULL, -> id_dep int (5) NOT NULL) -> ENGINE = myISAM; Query OK, 0 rows affected (0.06 sec)</pre> <pre>MariaDB [mayang_kantor]> create table departemen(-> id_dep int(5) NOT NULL, -> nama_dep varchar (30) NOT NULL, -> PRIMARY KEY(id_dep)) -> ENGINE = myISAM; Query OK, 0 rows affected (0.02 sec)</pre> <ul style="list-style-type: none"> Tabel karyawan <pre>MariaDB [mayang_kantor]> insert into karyawan (nama, id_dep) -> values ('Agus', 10), ('Budi', 16), ('Citra', 12), ('Dani', 17); Query OK, 4 rows affected (0.00 sec) Records: 4 Duplicates: 0 Warnings: 0</pre> <pre>MariaDB [mayang_kantor]> select * from karyawan; +-----+-----+ nama id_dep +-----+-----+ Agus 10 Budi 16 Citra 12 Dani 17 +-----+-----+ 4 rows in set (0.00 sec)</pre>
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- Tabel Departemen

```
MariaDB [mayang_kantor]> insert into departemen (id_dep, nama_dep)
-> values (10, 'Penelitian'), (11, 'Penelitian'), (12, 'SDM'), (13, 'Keuangan');
Query OK, 4 rows affected (0.00 sec)
Records: 4 Duplicates: 0 Warnings: 0
```

```
MariaDB [mayang_kantor]> select * from departemen;
+-----+-----+
| id_dep | nama_dep |
+-----+-----+
|      10 | Penelitian |
|      11 | Penelitian |
|      12 | SDM      |
|      13 | Keuangan  |
+-----+-----+
4 rows in set (0.00 sec)
```

2 Inner Join

a. Data karyawan yang memiliki departemen

```
MariaDB [mayang_kantor]> select * from karyawan
-> INNER JOIN departemen
-> On karyawan.id_dep = departemen.id_dep;
+-----+-----+-----+-----+
| nama  | id_dep | id_dep | nama_dep |
+-----+-----+-----+-----+
| Agus  |      10 |      10 | Penelitian |
| Citra |      12 |      12 | SDM      |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

Dalam pengambilan data ini, kita juga bisa menspesifikasikan field terkait. Sebagai contoh, hanya mengambil nama karyawan dan nama departemen saja.

```
MariaDB [mayang_kantor]> select k.nama, d.nama_dep
-> from karyawan k
-> inner join departemen d
-> on k.id_dep = d.id_dep;
+-----+-----+
| nama  | nama_dep |
+-----+-----+
| Agus  | Penelitian |
| Citra | SDM      |
+-----+-----+
2 rows in set (0.00 sec)
```

3 Outer Join

a. Left Outer Join

Data seluruh karyawan (yang memiliki departemen maupun tidak)

```
MariaDB [mayang_kantor]> select * from karyawan k left outer join departemen d
-> on k.id_dep = d.id_dep;

+-----+-----+-----+-----+
| nama  | id_dep | id_dep | nama_dep |
+-----+-----+-----+-----+
| Agus  | 10     | 10     | Penelitian |
| Budi  | 16     | NULL    | NULL      |
| Citra | 12     | 12     | SDM       |
| Dani  | 17     | NULL    | NULL      |
+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

Data karyawan yang tidak memiliki departemen

```
MariaDB [mayang_kantor]> select * from karyawan k left outer join departemen d
-> on k.id_dep = d.id_dep
-> where d.id_dep is null;

+-----+-----+-----+-----+
| nama  | id_dep | id_dep | nama_dep |
+-----+-----+-----+-----+
| Budi  | 16     | NULL    | NULL      |
| Dani  | 17     | NULL    | NULL      |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

b. Right Outer Join

```
MariaDB [mayang_kantor]> select * from karyawan k right outer join departemen d
-> on k.id_dep = d.id_dep;

+-----+-----+-----+-----+
| nama  | id_dep | id_dep | nama_dep |
+-----+-----+-----+-----+
| Agus  | 10     | 10     | Penelitian |
| Citra | 12     | 12     | SDM       |
| NULL  | NULL   | 11     | Penelitian |
| NULL  | NULL   | 13     | Keuangan  |
+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

c. Full Outer Join

```
MariaDB [mayang_kantor]> select * from karyawan k left outer join departemen d
-> on k.id_dep = d.id_dep
-> union
-> select * from karyawan k right outer join departemen d
-> on k.id_dep = d.id_dep;

+-----+-----+-----+-----+
| nama  | id_dep | id_dep | nama_dep |
+-----+-----+-----+-----+
| Agus  | 10     | 10     | Penelitian |
| Budi  | 16     | NULL    | NULL      |
| Citra | 12     | 12     | SDM       |
| Dani  | 17     | NULL    | NULL      |
| NULL  | NULL   | 11     | Penelitian |
| NULL  | NULL   | 13     | Keuangan  |
+-----+-----+-----+-----+
6 rows in set (0.02 sec)
```

d. Cross Join

```
MariaDB [mayang_kantor]> select * from karyawan cross join departemen;
```

nama	id_dep	id_dep	nama_dep
Agus	10	10	Penelitian
Budi	16	10	Penelitian
Citra	12	10	Penelitian
Dani	17	10	Penelitian
Agus	10	11	Penelitian
Budi	16	11	Penelitian
Citra	12	11	Penelitian
Dani	17	11	Penelitian
Agus	10	12	SDM
Budi	16	12	SDM
Citra	12	12	SDM
Dani	17	12	SDM
Agus	10	13	Keuangan
Budi	16	13	Keuangan
Citra	12	13	Keuangan
Dani	17	13	Keuangan

```
16 rows in set (0.00 sec)
```

```
MariaDB [mayang_kantor]> select * from karyawan, departemen;
```

nama	id_dep	id_dep	nama_dep
Agus	10	10	Penelitian
Budi	16	10	Penelitian
Citra	12	10	Penelitian
Dani	17	10	Penelitian
Agus	10	11	Penelitian
Budi	16	11	Penelitian
Citra	12	11	Penelitian
Dani	17	11	Penelitian
Agus	10	12	SDM
Budi	16	12	SDM
Citra	12	12	SDM
Dani	17	12	SDM
Agus	10	13	Keuangan
Budi	16	13	Keuangan
Citra	12	13	Keuangan
Dani	17	13	Keuangan

```
16 rows in set (0.00 sec)
```

B. Tugas

1	<p>Tabel mahasiswa</p> <pre>MariaDB [mayang_kantor]> create table mahasiswa(-> nim int(3) NOT NULL, -> nama varchar(20) NOT NULL, -> jenis_kelamin enum('L', 'P') NOT NULL, -> alamat varchar(20) NOT NULL, -> PRIMARY KEY(nim)); Query OK, 0 rows affected (0.04 sec)</pre> <pre>MariaDB [mayang_kantor]> insert into mahasiswa (nim, nama, jenis_kelamin, alamat) -> values (101, 'Arif', 'L', 'Jl.Kenangan'), -> (102, 'Budi', 'L', 'Jl.Jombang'), -> (103, 'Wati', 'P', 'Jl.Surabaya'), -> (104, 'Ika', 'P', 'Jl.Jombang'), -> (105, 'Tono', 'L', 'Jl.Jakarta'), -> (106, 'Iwan', 'L', 'Jl.Bandung'), -> (107, 'Sari', 'P', 'Jl.Malang'); Query OK, 7 rows affected (0.02 sec) Records: 7 Duplicates: 0 Warnings: 0</pre> <pre>MariaDB [mayang_kantor]> select * from mahasiswa; +-----+-----+-----+-----+ nim nama jenis_kelamin alamat +-----+-----+-----+-----+ 101 Arif L Jl.Kenangan 102 Budi L Jl.Jombang 103 Wati P Jl.Surabaya 104 Ika P Jl.Jombang 105 Tono L Jl.Jakarta 106 Iwan L Jl.Bandung 107 Sari P Jl.Malang +-----+-----+-----+-----+ 7 rows in set (0.00 sec)</pre>
2	<p>Tabel ambil_mk</p> <pre>MariaDB [mayang_kantor]> create table ambil_mk (-> nim int(10) not null, -> kode_mk varchar(50) not null); Query OK, 0 rows affected (0.05 sec)</pre>

```

MariaDB [mayang_kantor]> insert into ambil_mk (nim, kode_mk)
  -> values (101, 'PTI447'),
  -> (103, 'TIK333'),
  -> (104, 'PTI333'),
  -> (104, 'PTI777'),
  -> (111, 'PTI123'),
  -> (123, 'PTI999');
Query OK, 6 rows affected (0.01 sec)
Records: 6  Duplicates: 0  Warnings: 0

```

```

MariaDB [mayang_kantor]> select * from ambil_mk
  -> ;
+-----+-----+
| nim   | kode_mk |
+-----+-----+
| 101   | PTI447  |
| 103   | TIK333  |
| 104   | PTI333  |
| 104   | PTI777  |
| 111   | PTI123  |
| 123   | PTI999  |
+-----+-----+
6 rows in set (0.00 sec)

```

3 Tabel matakuliah

```

MariaDB [mayang_kantor]> create table matakuliah (
  -> kode_mk varchar(10) not null,
  -> nama_mk varchar(100) not null,
  -> sks int(2) not null,
  -> semester int(2) not null,
  -> primary key (kode_mk))
  -> engine = InnoDB;
Query OK, 0 rows affected (0.04 sec)

```

```

MariaDB [mayang_kantor]> insert into matakuliah (kode_mk, nama_mk, sks, semester)
  -> values ('PTI447', 'Praktikum Basis Data', 1, 3),
  -> ('TIK342', 'Praktikum Basis Data', 1, 3),
  -> ('PTI333', 'Basis Data Terdistribusi', 3, 5),
  -> ('TIK123', 'Jaringan Komputer', 2, 5),
  -> ('TIK333', 'Sistem Operasi', 3, 5),
  -> ('PTI123', 'Grafika Multimedia', 3, 5),
  -> ('PTI777', 'Sistem Informasi', 2, 3);
Query OK, 7 rows affected (0.07 sec)
Records: 7  Duplicates: 0  Warnings: 0

```

	<pre> MariaDB [mayang_kantor]> select * from matakuliah -> ; +-----+-----+-----+-----+ kode_mk nama_mk sks semester +-----+-----+-----+-----+ PTI123 Grafika Multimedia 3 5 PTI333 Basis Data Terdistribusi 3 5 PTI447 Praktikum Basis Data 1 3 PTI777 Sistem Informasi 2 3 TIK123 Jaringan Komputer 2 5 TIK333 Sistem Operasi 3 5 TIK342 Praktikum Basis Data 1 3 +-----+-----+-----+-----+ 7 rows in set (0.00 sec) </pre>
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C. Soal

1	<p>Dapatkan data mahasiswa yang mengambil matakuliah. Selesaikan dengan pendekatan join eksplisit dan implisit. Hindari duplikasi data.</p> <pre> MariaDB [mayang_kantor]> select a.nim, m.nama from ambil_mk a inner join mahasiswa m on m.nim = a.nim union select a.nim, m.nama from ambil_mk a inner join mahasiswa m on m.nim = a.nim; +-----+-----+ nim nama +-----+-----+ 101 Arif 103 Wati 104 Ika +-----+-----+ 3 rows in set (0.00 sec) </pre>
2	<p>Kelompokkan data mahasiswa yang tidak mengambil matakuliah berdasarkan jenis kelaminnya, kemudian hitung banyaknya.</p> <pre> MariaDB [mayang_kantor]> select jenis_kelamin, count(jenis_kelamin) as jumlah from mahasiswa group by jenis_kelamin; +-----+-----+ jenis_kelamin jumlah +-----+-----+ L 4 P 3 +-----+-----+ 2 rows in set (0.00 sec) </pre>

3	Dapatkan nim dan nama mahasiswa yang mengambil matakuliah beserta kode_mk dan nama_mk yang diambalnya. Selesaikan dengan pendekatan join eksplisit dan implisit.
	<pre> MariaDB [mayang_kantor]> select m.nim, k.kode_mk, k.nama_mk from mahasiswa m, matakuliah k, ambil_mk a where m.nim = a.nim and a.kode_mk = k.kode_mk; +-----+-----+-----+ nim kode_mk nama_mk +-----+-----+-----+ 101 PTI447 Praktikum Basis Data 103 TIK333 Sistem Operasi 104 PTI333 Basis Data Terdistribusi 104 PTI777 Sistem Informasi +-----+-----+-----+ 4 rows in set (0.00 sec) </pre>
4	Dapatkan nim, nama, dan total sks yang diambil oleh mahasiswa, di mana total sksnya lebih dari 4 dan kurang dari 10.
	<pre> MariaDB [mayang_kantor]> select m.nim, m.nama, sum(sks) as total_sks from mahasiswa m, ambil_mk a, matakuliah k where m.nim = a.nim and a.kode_mk = k.kode_mk group by nama having sum(sks)>4 and sum(sks)<10; +-----+-----+-----+ nim nama total_sks +-----+-----+-----+ 104 Ika 5 +-----+-----+-----+ 1 row in set (0.00 sec) </pre>
5	Dapatkan matakuliah yang tidak diambil oleh mahasiswa terdaftar (mahasiswa di tabel mahasiswa).
	<pre> MariaDB [mayang_kantor]> select k.kode_mk, k.nama_mk, sks, semester from mahasiswa m left join -> ambil_mk a on m.nim = a.nim right join matakuliah k on a.kode_mk = k.kode_mk where nama is -> null; +-----+-----+-----+-----+ kode_mk nama_mk sks semester +-----+-----+-----+-----+ PTI123 Grafika Multimedia 3 5 TIK123 Jaringan Komputer 2 5 TIK342 Praktikum Basis Data 1 3 +-----+-----+-----+-----+ 3 rows in set (0.00 sec) </pre>