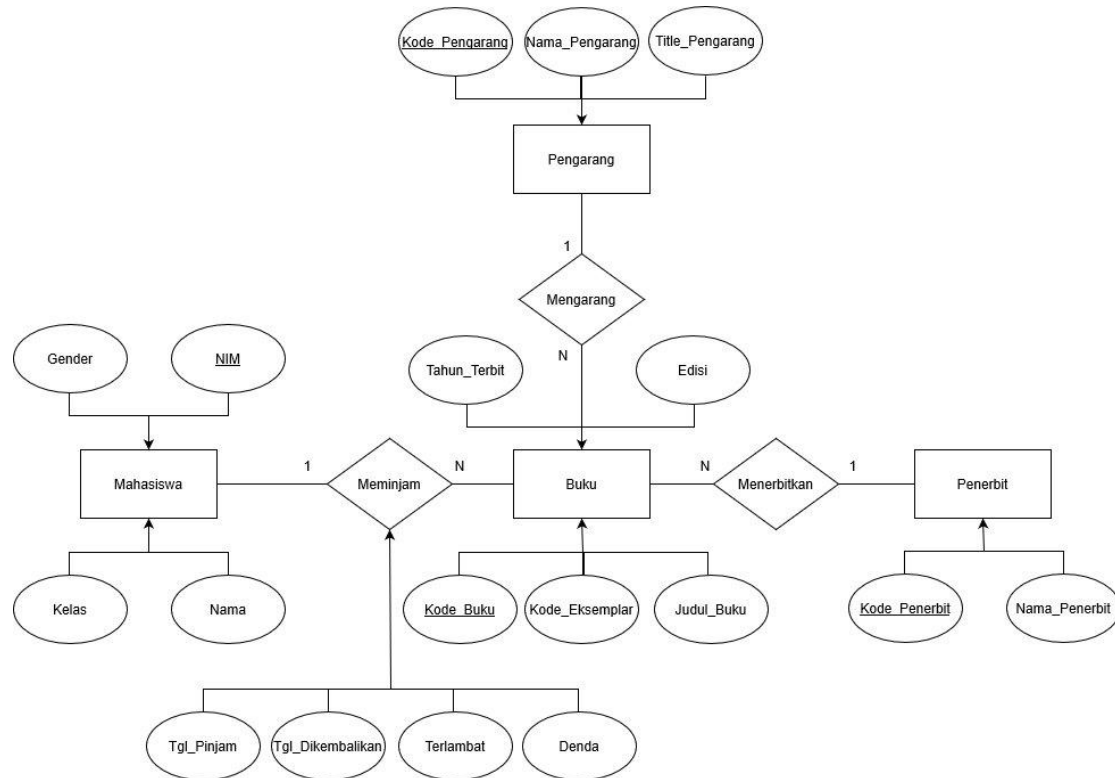Nama   : Rifqi Alwan Pramasandy
NIM   : L200180008
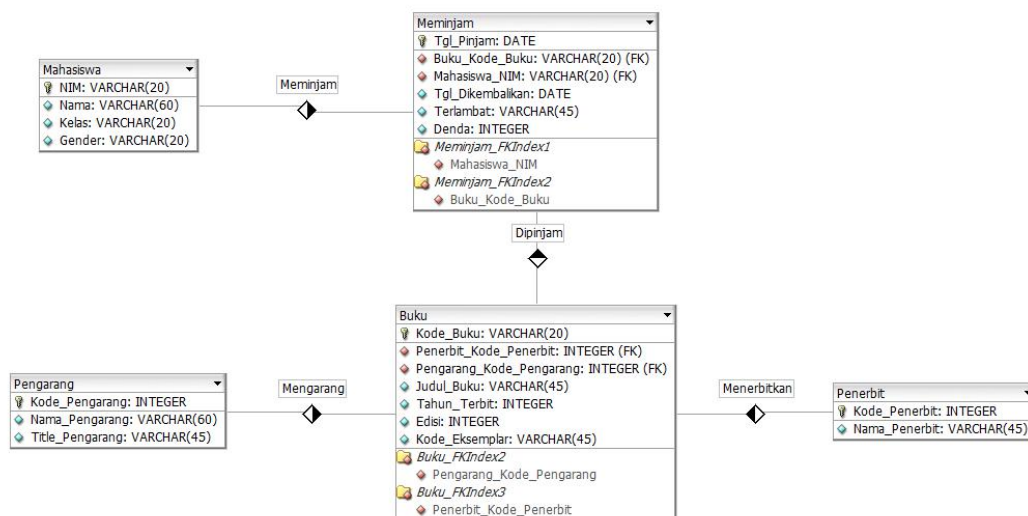Kelas A

a. Entity Relationship Diagram (ERD) database sirkulasi perpustakaan

b. Relasi :
    i.   Mahasiswa meminjam Buku   = 1:n (one to many)
    ii. Penerbit menernitkan Buku   = 1:n (one to many)
    iii. Pengarang mengarang Buku   = 1:n (one to many)

c. ERD dengan DBDesigner

d. Implementasi rancangan ERD menggunakan query SQL : CREATE
Membuat database perpustakaan

```
MariaDB [(none)]> CREATE DATABASE perpustakaan;
Query OK, 1 row affected (0.00 sec)

MariaDB [(none)]> USE perpustakaan;
Database changed
```

Membuat table Mahasiswa

```
MariaDB [perpustakaan]> CREATE TABLE Mahasiswa (
    -> NIM VARCHAR(20) NOT NULL PRIMARY KEY,
    -> Nama VARCHAR(60) NOT NULL,
    -> Kelas VARCHAR(20) NOT NULL,
    -> Gender VARCHAR(20) NOT NULL);
Query OK, 0 rows affected (0.55 sec)

MariaDB [perpustakaan]> DESC Mahasiswa;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| NIM    | varchar(20) | NO   | PRI | NULL    |       |
| Nama   | varchar(60) | NO   |     | NULL    |       |
| Kelas  | varchar(20) | NO   |     | NULL    |       |
| Gender | varchar(20) | NO   |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
4 rows in set (0.02 sec)
```

Membuat table Penerbit

```
MariaDB [perpustakaan]> CREATE TABLE Penerbit (
    -> Kode_Penerbit INT NOT NULL PRIMARY KEY,
    -> Nama_Penerbit VARCHAR(45) NOT NULL);
Query OK, 0 rows affected (0.24 sec)

MariaDB [perpustakaan]> DESC Penerbit;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| Kode_Penerbit | int(11)     | NO   | PRI | NULL    |       |
| Nama_Penerbit | varchar(45) | NO   |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
2 rows in set (0.01 sec)
```

Membuat table Pengarang

```
MariaDB [perpustakaan]> CREATE TABLE Pengarang (
    -> Kode_Pengarang INT NOT NULL AUTO_INCREMENT PRIMARY KEY,
    -> Nama_Pengarang VARCHAR(60) NOT NULL,
    -> Title_Pengarang VARCHAR(45) NOT NULL);
Query OK, 0 rows affected (0.22 sec)

MariaDB [perpustakaan]> DESC Pengarang;
+-----------------+-------------+------+-----+---------+----------------+
| Field           | Type        | Null | Key | Default | Extra          |
+-----------------+-------------+------+-----+---------+----------------+
| Kode_Pengarang  | int(11)     | NO   | PRI | NULL    | auto_increment |
| Nama_Pengarang  | varchar(60) | NO   |     | NULL    |                |
| Title_Pengarang | varchar(45) | NO   |     | NULL    |                |
+-----------------+-------------+------+-----+---------+----------------+
3 rows in set (0.01 sec)
```

Membuat table Buku

```
MariaDB [perpustakaan]> CREATE TABLE Buku (
    -> Kode_Buku VARCHAR(20) NOT NULL PRIMARY KEY,
    -> Penerbit_Kode_Penerbit INT NOT NULL,
    -> Pengarang_Kode_Pengarang INT NOT NULL,
    -> Judul_Bbuku VARCHAR(45) NOT NULL,
    -> Tahun_Terbit INT NOT NULL,
    -> Edisi INT NOT NULL,
    -> Kode_Eksemplar VARCHAR(45) NOT NULL,
    -> FOREIGN KEY(Penerbit_Kode_Penerbit) REFERENCES Penerbit(Kode_Penerbit) ON DELETE CASCADE ON UPDATE CASCADE,
    -> FOREIGN KEY(Pengarang_Kode_Pengarang) REFERENCES Pengarang(Kode_Pengarang) ON DELETE CASCADE ON UPDATE CASCADE);
Query OK, 0 rows affected (0.28 sec)

MariaDB [perpustakaan]> DESC Buku;
+--------------------------+-------------+------+-----+---------+-------+
| Field                    | Type        | Null | Key | Default | Extra |
+--------------------------+-------------+------+-----+---------+-------+
| Kode_Buku                | varchar(20) | NO   | PRI | NULL    |       |
| Penerbit_Kode_Penerbit   | int(11)     | NO   | MUL | NULL    |       |
| Pengarang_Kode_Pengarang | int(11)     | NO   | MUL | NULL    |       |
| Judul_Bbuku              | varchar(45) | NO   |     | NULL    |       |
| Tahun_Terbit             | int(11)     | NO   |     | NULL    |       |
| Edisi                    | int(11)     | NO   |     | NULL    |       |
| Kode_Eksemplar           | varchar(45) | NO   |     | NULL    |       |
+--------------------------+-------------+------+-----+---------+-------+
7 rows in set (0.07 sec)
```

Membuat table Meminjam

```
MariaDB [perpustakaan]> CREATE TABLE Meminjam (
    -> Tgl_Pinjam DATE NOT NULL,
    -> Buku_Kode_Buku VARCHAR(20) NOT NULL,
    -> Mahasiswa_NIM VARCHAR(20) NOT NULL,
    -> Tgl_Dikembalikan DATE NOT NULL,
    -> Terlambat VARCHAR(45) NOT NULL,
    -> Denda INT NOT NULL,
    -> PRIMARY KEY(Buku_Kode_Buku, Mahasiswa_NIM),
    -> FOREIGN KEY(Buku_Kode_Buku) REFERENCES Buku(Kode_Buku) ON DELETE CASCADE ON UPDATE CASCADE,
    -> FOREIGN KEY(Mahasiswa_NIM) REFERENCES Mahasiswa(NIM) ON DELETE CASCADE ON UPDATE CASCADE);
Query OK, 0 rows affected (0.24 sec)

MariaDB [perpustakaan]> DESC Meminjam;
ERROR 1036 (HY000): Table 'C:\xampp\tmp\#sqlae8_2_5.MAI' is read only
MariaDB [perpustakaan]> DESC Meminjam;
+------------------+-------------+------+-----+---------+-------+
| Field            | Type        | Null | Key | Default | Extra |
+------------------+-------------+------+-----+---------+-------+
| Tgl_Pinjam       | date        | NO   |     | NULL    |       |
| Buku_Kode_Buku   | varchar(20) | NO   | PRI | NULL    |       |
| Mahasiswa_NIM    | varchar(20) | NO   | PRI | NULL    |       |
| Tgl_Dikembalikan | date        | NO   |     | NULL    |       |
| Terlambat        | varchar(45) | NO   |     | NULL    |       |
| Denda            | int(11)     | NO   |     | NULL    |       |
+------------------+-------------+------+-----+---------+-------+
6 rows in set (0.01 sec)
```

e. Menambahkan record pada masing-masing tabel
Menambahkan record pada Tabel Mahasiswa

```
MariaDB [perpustakaan]> INSERT INTO Mahasiswa VALUES
    -> ('L200180001', 'Andhika', 'A', 'Laki-Laki'),
    -> ('L200180002', 'Nayla', 'B', 'Perempuan'),
    -> ('L200180003', 'Aisyah', 'C', 'Perempuan'),
    -> ('L200180004', 'Siska', 'B', 'Perempuan'),
    -> ('L200180005', 'Reno', 'C', 'Laki-Laki'),
    -> ('L200180006', 'Jefri', 'B', 'Laki-Laki'),
    -> ('L200180007', 'Amanda', 'A', 'Perempuan'),
    -> ('L200180008', 'Budi', 'A', 'Laki-Laki'),
    -> ('L200180009', 'Ihsan', 'C', 'Laki-Laki'),
    -> ('L200180010', 'Linda', 'C', 'Perempuan');
Query OK, 10 rows affected (0.37 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [perpustakaan]> SELECT * FROM Mahasiswa;
+-----------+---------+-------+-----------+
| NIM       | Nama    | Kelas | Gender    |
+-----------+---------+-------+-----------+
| L200180001 | Andhika | A     | Laki-Laki |
| L200180002 | Nayla   | B     | Perempuan |
| L200180003 | Aisyah  | C     | Perempuan |
| L200180004 | Siska   | B     | Perempuan |
| L200180005 | Reno    | C     | Laki-Laki |
| L200180006 | Jefri   | B     | Laki-Laki |
| L200180007 | Amanda  | A     | Perempuan |
| L200180008 | Budi    | A     | Laki-Laki |
| L200180009 | Ihsan   | C     | Laki-Laki |
| L200180010 | Linda   | C     | Perempuan |
+-----------+---------+-------+-----------+
10 rows in set (0.11 sec)
```

Menambahkan record pada Tabel Penerbit

```
MariaDB [perpustakaan]> INSERT INTO Penerbit VALUES
    -> (101, 'Gagas Media'),
    -> (102, 'Tiga Serangkai'),
    -> (103, 'Expose'),
    -> (104, 'Bentang Pustaka'),
    -> (105, 'Gramedia'),
    -> (106, 'Agro Media'),
    -> (107, 'Penulis Cilik'),
    -> (108, 'Noura Books'),
    -> (109, 'Mizan'),
    -> (110, 'Andi Publisher');
Query OK, 10 rows affected (0.08 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [perpustakaan]> SELECT * FROM Penerbit;
+--------------+----------------+
| Kode_Penerbit | Nama_Penerbit |
+--------------+----------------+
|          101 | Gagas Media    |
|          102 | Tiga Serangkai |
|          103 | Expose         |
|          104 | Bentang Pustaka |
|          105 | Gramedia       |
|          106 | Agro Media     |
|          107 | Penulis Cilik  |
|          108 | Noura Books    |
|          109 | Mizan          |
|          110 | Andi Publisher |
+--------------+----------------+
10 rows in set (0.00 sec)
```

Menambahkan record pada Tabel Pengarang

```
MariaDB [perpustakaan]> INSERT INTO Pengarang VALUES
    -> (1011, 'Joko', 'S.Pd.'),
    -> (1012, 'Warno', ''),
    -> (1013, 'Prapto', 'S.Kom.'),
    -> (1014, 'Sudi', 'Dr.'),
    -> (1015, 'Tono', ''),
    -> (1016, 'Ranto', 'M.Pd.'),
    -> (1017, 'Siti', ''),
    -> (1018, 'Heru', 'M.Si.'),
    -> (1019, 'Rasidi', 'M.Kom.'),
    -> (1020, 'Riani', 'dr.');
Query OK, 10 rows affected (0.13 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [perpustakaan]> SELECT * FROM Pengarang;
+---------------+---------------+----------------+
| Kode_Pengarang | Nama_Pengarang | Title_Pengarang |
+---------------+---------------+----------------+
|          1011 | Joko          | S.Pd.          |
|          1012 | Warno         |                |
|          1013 | Prapto        | S.Kom.         |
|          1014 | Sudi          | Dr.            |
|          1015 | Tono          |                |
|          1016 | Ranto         | M.Pd.          |
|          1017 | Siti          |                |
|          1018 | Heru          | M.Si.          |
|          1019 | Rasidi        | M.Kom.         |
|          1020 | Riani         | dr.            |
+---------------+---------------+----------------+
10 rows in set (0.00 sec)
```

Menambahkan record pada Tabel Buku

```
MariaDB [perpustakaan]> INSERT INTO Buku VALUES
    -> ('001.01/jk', 101, 1011, 'Algoritma dan Struktur Data', 2009, 1, '001.01/jk/001'),
    -> ('001.02/jk', 101, 1011, 'Algoritma dan Pemrograman', 2010, 2, '001.02/jk/002'),
    -> ('001.03/rn', 109, 1020, 'Remaja Masa Kini', 2000, 3, '001.03/rn/003'),
    -> ('001.04/tn', 107, 1015, 'Cinta Buta', 2018, 1, '001.04/tn/004'),
    -> ('001.05/pr', 106, 1013, 'Pendidikan Pancasila', 1999, 2, '001.05/pr/005'),
    -> ('001.06/st', 110, 1017, 'Reinkarnasi', 2009, 3, '001.06/st/006'),
    -> ('001.07/rs', 110, 1019, 'Konspirasi NASA', 2001, 1, '001.07/rs/007'),
    -> ('001.08/hr', 103, 1018, 'Matematika', 2004, 2, '001.08/hr/008'),
    -> ('001.09/sd', 106, 1014, 'Sistem Basis Data', 2001, 1, '001.09/sd/009'),
    -> ('001.10/wr', 102, 1012, 'Hujan', 2009, 2, '001.10/wr/010');
Query OK, 10 rows affected (0.28 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [perpustakaan]> SELECT * FROM Buku;
+-----------+-----------------------+------------------------+-----------------------------+--------------+-------+---------------+
| Kode_Buku | Penerbit_Kode_Penerbit | Pengarang_Kode_Pengarang | Judul_Bbuku                 | Tahun_Terbit | Edisi | Kode_Eksemplar |
+-----------+-----------------------+------------------------+-----------------------------+--------------+-------+---------------+
| 001.01/jk |                   101 |                   1011 | Algoritma dan Struktur Data |         2009 |     1 | 001.01/jk/001 |
| 001.02/jk |                   101 |                   1011 | Algoritma dan Pemrograman   |         2010 |     2 | 001.02/jk/002 |
| 001.03/rn |                   109 |                   1020 | Remaja Masa Kini            |         2000 |     3 | 001.03/rn/003 |
| 001.04/tn |                   107 |                   1015 | Cinta Buta                  |         2018 |     1 | 001.04/tn/004 |
| 001.05/pr |                   106 |                   1013 | Pendidikan Pancasila        |         1999 |     2 | 001.05/pr/005 |
| 001.06/st |                   110 |                   1017 | Reinkarnasi                 |         2009 |     3 | 001.06/st/006 |
| 001.07/rs |                   110 |                   1019 | Konspirasi NASA             |         2001 |     1 | 001.07/rs/007 |
| 001.08/hr |                   103 |                   1018 | Matematika                  |         2004 |     2 | 001.08/hr/008 |
| 001.09/sd |                   106 |                   1014 | Sistem Basis Data           |         2001 |     1 | 001.09/sd/009 |
| 001.10/wr |                   102 |                   1012 | Hujan                       |         2009 |     2 | 001.10/wr/010 |
+-----------+-----------------------+------------------------+-----------------------------+--------------+-------+---------------+
10 rows in set (0.00 sec)
```

Menambahkan record pada Tabel Meminjam

```
MariaDB [perpustakaan]> INSERT INTO Meminjam VALUES
    -> ('2019-05-12', '001.02/jk', 'L200180001', '2019-05-19', 'Ya', 1000),
    -> ('2019-05-13', '001.03/rn', 'L200180002', '2019-05-20', 'Tidak', 0),
    -> ('2019-03-12', '001.06/st', 'L200180003', '2019-03-19', 'Tidak', 0),
    -> ('2019-01-11', '001.01/jk', 'L200180004', '2019-01-16', 'Tidak', 0),
    -> ('2019-10-13', '001.10/wr', 'L200180005', '2019-10-20', 'Ya', 5000),
    -> ('2019-04-12', '001.10/wr', 'L200180006', '2019-04-19', 'Tidak', 0),
    -> ('2019-05-13', '001.07/rs', 'L200180007', '2019-05-20', 'Ya', 4000),
    -> ('2019-04-10', '001.03/rn', 'L200180008', '2019-04-15', 'Ya', 5000),
    -> ('2019-06-09', '001.09/sd', 'L200180009', '2019-06-14', 'Tidak', 0),
    -> ('2019-01-20', '001.04/tn', 'L200180010', '2019-01-27', 'Tidak', 0);
Query OK, 10 rows affected (0.15 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [perpustakaan]> SELECT * FROM Meminjam;
+------------+----------------+--------------+------------------+-----------+-------+
| Tgl_Pinjam | Buku_Kode_Buku | Mahasiswa_NIM | Tgl_Dikembalikan | Terlambat | Denda |
+------------+----------------+--------------+------------------+-----------+-------+
| 2019-01-11 | 001.01/jk      | L200180004   | 2019-01-16       | Tidak     |     0 |
| 2019-05-12 | 001.02/jk      | L200180001   | 2019-05-19       | Ya        |  1000 |
| 2019-05-13 | 001.03/rn      | L200180002   | 2019-05-20       | Tidak     |     0 |
| 2019-04-10 | 001.03/rn      | L200180008   | 2019-04-15       | Ya        |  5000 |
| 2019-01-20 | 001.04/tn      | L200180010   | 2019-01-27       | Tidak     |     0 |
| 2019-03-12 | 001.06/st      | L200180003   | 2019-03-19       | Tidak     |     0 |
| 2019-05-13 | 001.07/rs      | L200180007   | 2019-05-20       | Ya        |  4000 |
| 2019-06-09 | 001.09/sd      | L200180009   | 2019-06-14       | Tidak     |     0 |
| 2019-10-13 | 001.10/wr      | L200180005   | 2019-10-20       | Ya        |  5000 |
| 2019-04-12 | 001.10/wr      | L200180006   | 2019-04-19       | Tidak     |     0 |
+------------+----------------+--------------+------------------+-----------+-------+
10 rows in set (0.00 sec)
```