# Advanced Database
# Midterm Exam


**Name**
Dicha Zelianivan Arkana

**NIM**
2241720002

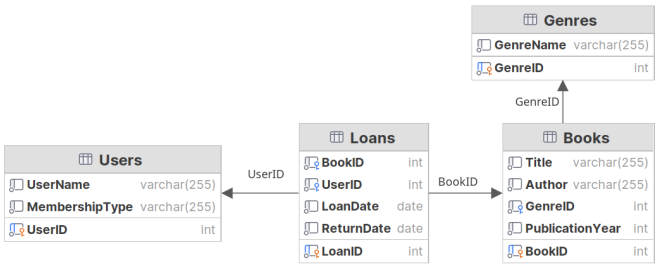
**Class**
2i

**Department**
Information Technology

**Study Program**
D4 Informatics Engineering

# 1 Tugas

1. Buatlah diagram relasi dari keempat table tersebut




2. Tampilkan semua isi semua tabel yang ada

```
SELECT * FROM Books;
```

| | BookID | Title | Author | GenreID | PublicationYear |
|---|---|---|---|---|---|
| 1 | 1 | The Matrix | Lana and Lilly Wachowski | 18 | 1999 |
| 2 | 2 | Jurassic Park | Michael Crichton | 1 | 1990 |
| 3 | 3 | The Lord of the Rings | J.R.R. Tolkien | 2 | 1954 |
| 4 | 4 | Finding Nemo | Andrew Stanton | 3 | 2003 |
| 5 | 5 | Steve Jobs: The Biography | Walter Isaacson | 4 | 2011 |
| 6 | 6 | Dumb and Dumber | Peter Farrelly | 5 | 1994 |
| 7 | 7 | The Godfather | Mario Puzo | 6 | 1969 |
| 8 | 8 | Planet Earth | David Attenborough | 7 | 2006 |
| 9 | 9 | The Shawshank Redemption | Stephen King | 8 | 1994 |
| 10 | 10 | The Incredibles | Brad Bird | 9 | 2004 |
| 11 | 11 | Inception | Christopher Nolan | 18 | 2010 |
| 12 | 12 | Casablanca | Michael Curtiz | 19 | 1942 |
| 13 | 13 | The Imitation Game | Graham Moore | 4 | 2014 |
| 14 | 14 | The Shining | Stephen King | 12 | 1977 |
| 15 | 15 | Bohemian Rhapsody | Anthony McCarten | 13 | 2018 |
| 16 | 16 | Les Misérables | Victor Hugo | 14 | 1862 |
| 17 | 17 | Sherlock Holmes | Arthur Conan Doyle | 15 | 1887 |
| 18 | 18 | Eternal Sunshine of the Spotless Mind | Charlie Kaufman | 8 | 2004 |
| 19 | 19 | The Da Vinci Code | Dan Brown | 16 | 2003 |
| 20 | 20 | Gladiator | David Franzoni | 20 | 2000 |

```
SELECT * FROM Genres;
```

| | GenreID | GenreName |
|---|---|---|
| 1 | 1 | Action |
| 2 | 2 | Adventure |
| 3 | 3 | Animation |
| 4 | 4 | Biography |
| 5 | 5 | Comedy |
| 6 | 6 | Crime |
| 7 | 7 | Documentary |
| 8 | 8 | Drama |
| 9 | 9 | Family |
| 10 | 10 | Fantasy |
| 11 | 11 | Film-Noir |
| 12 | 12 | History |
| 13 | 13 | Horror |
| 14 | 14 | Music |
| 15 | 15 | Musical |
| 16 | 16 | Mystery |
| 17 | 17 | Romance |
| 18 | 18 | Sci-Fi |
| 19 | 19 | Sport |
| 20 | 20 | Thriller |
| 21 | 21 | War |

```
SELECT * FROM Users;
```

| | UserID | UserName | MembershipType |
|---|---|---|---|
| 1 | 1 | John | Silver |
| 2 | 2 | Dicha | Platinum |
| 3 | 3 | Jack | Gold |
| 4 | 4 | Jill | Gold |
| 5 | 5 | James | Platinum |
| 6 | 6 | Judy | Gold |
| 7 | 7 | Joe | Platinum |
| 8 | 8 | Jenny | Gold |
| 9 | 9 | Josh | Platinum |
| 10 | 10 | Jasmine | Gold |

```
SELECT * FROM Loans;
```

| | LoanID | BookID | UserID | LoanDate | ReturnDate |
|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 2023-01-05 | 2023-02-05 |
| 2 | 2 | 4 | 1 | 2023-02-10 | 2023-03-10 |
| 3 | 3 | 7 | 1 | 2023-03-15 | 2023-04-15 |
| 4 | 4 | 2 | 2 | 2023-01-07 | 2023-02-07 |
| 5 | 5 | 5 | 2 | 2023-02-15 | 2023-03-15 |
| 6 | 6 | 8 | 2 | 2023-03-20 | 2023-04-20 |
| 7 | 7 | 3 | 3 | 2023-01-09 | 2023-02-09 |
| 8 | 8 | 6 | 3 | 2023-02-20 | 2023-03-20 |
| 9 | 9 | 9 | 3 | 2023-03-25 | 2023-04-25 |
| 10 | 10 | 10 | 4 | 2023-01-12 | 2023-02-12 |
| 11 | 11 | 13 | 4 | 2023-02-25 | 2023-03-25 |
| 12 | 12 | 16 | 4 | 2023-03-30 | 2023-04-30 |
| 13 | 13 | 11 | 5 | 2023-01-14 | 2023-02-14 |
| 14 | 14 | 14 | 5 | 2023-02-28 | 2023-03-28 |
| 15 | 15 | 17 | 5 | 2023-03-05 | 2023-04-05 |
| 16 | 16 | 11 | 6 | 2023-01-16 | 2023-02-16 |
| 17 | 17 | 15 | 6 | 2023-03-01 | 2023-04-01 |
| 18 | 18 | 19 | 7 | 2023-01-18 | 2023-02-18 |
| 19 | 19 | 18 | 7 | 2023-02-03 | 2023-03-03 |
| 20 | 20 | 11 | 8 | 2023-01-20 | 2023-02-20 |
| 21 | 21 | 18 | 8 | 2023-02-05 | 2023-03-05 |

3. Tampilkan semua judul buku beserta nama penulisnya yang belum pernah dipinjam

```
SELECT Title, Author
FROM Books
WHERE BookID NOT IN (SELECT BookID FROM Loans);
```

| | Title | Author |
|---|---|---|
| 1 | Casablanca | Michael Curtiz |
| 2 | Gladiator | David Franzoni |

4. Buatlah query untuk menemukan jumlah buku yang dipinjam per genre

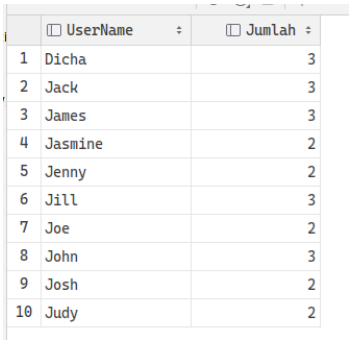
```sql
SELECT
    GenreName,
    COUNT(Books.BookID) AS Jumlah
FROM Books
    JOIN Genres ON Books.GenreID = Genres.GenreID
    JOIN Loans ON Books.BookID = Loans.BookID
GROUP BY GenreName;
```

15 rows

| | GenreName | Jumlah |
|---|---|---|
| 1 | Action | 1 |
| 2 | Adventure | 3 |
| 3 | Animation | 1 |
| 4 | Biography | 2 |
| 5 | Comedy | 1 |
| 6 | Crime | 2 |
| 7 | Documentary | 1 |
| 8 | Drama | 3 |
| 9 | Family | 1 |
| 10 | History | 1 |
| 11 | Horror | 1 |
| 12 | Music | 1 |
| 13 | Musical | 1 |
| 14 | Mystery | 1 |
| 15 | Sci-Fi | 5 |

5. Carilah jumlah total peminjaman per pengguna

```
SELECT
    UserName,
    COUNT(BookID) AS Jumlah
FROM Loans
    JOIN Users ON Loans.UserID = Users.UserID
GROUP BY UserName;
```



| | UserName | Jumlah |
|---|---|---|
| 1 | Dicha | 3 |
| 2 | Jack | 3 |
| 3 | James | 3 |
| 4 | Jasmine | 2 |
| 5 | Jenny | 2 |
| 6 | Jill | 3 |
| 7 | Joe | 2 |
| 8 | John | 3 |
| 9 | Josh | 2 |
| 10 | Judy | 2 |

6. Temukan buku yang paling sering dipinjam

```
SELECT
    Title,
    COUNT(Loans.BookID) AS Jumlah
FROM Loans JOIN Books ON Loans.BookID = Books.BookID
GROUP BY Title
ORDER BY Jumlah DESC
```

| | Title | Jumlah |
|---|---|---|
| 1 | Inception | 3 |
| 2 | The Lord of the Rings | 3 |
| 3 | The Matrix | 2 |
| 4 | The Godfather | 2 |
| 5 | Eternal Sunshine of the Spotless Mind | 2 |
| 6 | Finding Nemo | 1 |
| 7 | Bohemian Rhapsody | 1 |
| 8 | Dumb and Dumber | 1 |
| 9 | Jurassic Park | 1 |
| 10 | Les Misérables | 1 |
| 11 | Planet Earth | 1 |
| 12 | Sherlock Holmes | 1 |
| 13 | Steve Jobs: The Biography | 1 |
| 14 | The Da Vinci Code | 1 |
| 15 | The Imitation Game | 1 |
| 16 | The Incredibles | 1 |
| 17 | The Shawshank Redemption | 1 |

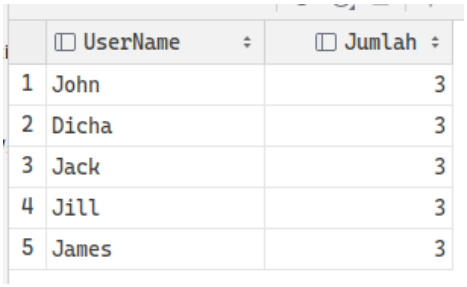
7. Tentukan rata rata lama waktu peminjaman untuk setiap buku

```
WITH LoanDuration AS (
    SELECT BookID, DATEDIFF(day, LoanDate, ReturnDate) AS Duration
    FROM Loans
)
SELECT
    Title,
    AVG(Duration) AS RataRata
FROM LoanDuration
    JOIN Books ON LoanDuration.BookID = Books.BookID
GROUP BY Title
ORDER BY RataRata DESC;
```

| | Title | RataRata |
|---|---|---|
| 1 | Bohemian Rhapsody | 31 |
| 2 | Inception | 31 |
| 3 | Jurassic Park | 31 |
| 4 | Les Misérables | 31 |
| 5 | Planet Earth | 31 |
| 6 | Sherlock Holmes | 31 |
| 7 | The Da Vinci Code | 31 |
| 8 | The Godfather | 31 |
| 9 | The Incredibles | 31 |
| 10 | The Matrix | 31 |
| 11 | The Shawshank Redemption | 31 |
| 12 | The Lord of the Rings | 29 |
| 13 | The Imitation Game | 28 |
| 14 | The Shining | 28 |
| 15 | Steve Jobs: The Biography | 28 |
| 16 | Dumb and Dumber | 28 |
| 17 | Eternal Sunshine of the Spotless Mind | 28 |

8. Buatlah daftar pengguna dengan jumlah peminjaman diatas rata rata

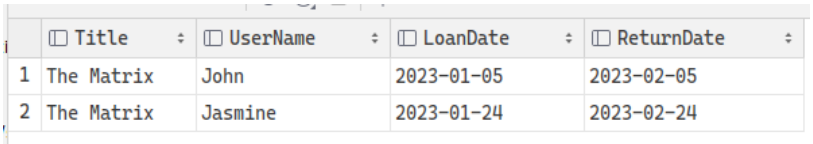
```sql
WITH UserLoans AS (
    SELECT UserID, COUNT(BookID) AS Jumlah
    FROM Loans
    GROUP BY UserID
)
SELECT UserName, Jumlah
FROM UserLoans
    JOIN Users ON UserLoans.UserID = Users.UserID
WHERE Jumlah > (SELECT AVG(Jumlah) FROM UserLoans);
```



| | UserName | Jumlah |
|---|---|---|
| 1 | John | 3 |
| 2 | Dicha | 3 |
| 3 | Jack | 3 |
| 4 | Jill | 3 |
| 5 | James | 3 |

9. Tampilkan histori peminjaman untuk buku dengan `BookID` tertentu

```sql
SELECT
    Title,
    UserName,
    LoanDate,
    ReturnDate
FROM Loans
    JOIN Books ON Loans.BookID = Books.BookID
    JOIN Users ON Loans.UserID = Users.UserID
WHERE Books.BookID = 1;
```



| | Title | UserName | LoanDate | ReturnDate |
|---|---|---|---|---|
| 1 | The Matrix | John | 2023-01-05 | 2023-02-05 |
| 2 | The Matrix | Jasmine | 2023-01-24 | 2023-02-24 |

10. Cari tahu siapa yang meminjam buku tertentu pada tanggal spesifik

```
SELECT
    UserName,
    Title,
    LoanDate,
    ReturnDate
FROM Loans
    JOIN Users ON Loans.UserID = Users.UserID
    JOIN Books ON Loans.BookID = Books.BookID
WHERE Books.BookID = 1
```

| | UserName | Title | LoanDate | ReturnDate |
|---|---|---|---|---|
| 1 | John | The Matrix | 2023-01-05 | 2023-02-05 |

11. Buatlah query untuk menampilkan buku yang paling lama dipinjam

```
WITH LoanDuration AS (
    SELECT
        BookID,
        DATEDIFF(day, LoanDate, ReturnDate) AS Duration
    FROM Loans
)
SELECT Title, Duration
FROM LoanDuration
    JOIN Books ON LoanDuration.BookID = Books.BookID
WHERE Duration = (SELECT MAX(Duration) FROM LoanDuration);
```

| | Title | Duration |
|---|---|---|
| 1 | The Matrix | 31 |
| 2 | The Godfather | 31 |
| 3 | Jurassic Park | 31 |
| 4 | Planet Earth | 31 |
| 5 | The Lord of the Rings | 31 |
| 6 | The Shawshank Redemption | 31 |
| 7 | The Incredibles | 31 |
| 8 | Les Misérables | 31 |
| 9 | Inception | 31 |
| 10 | Sherlock Holmes | 31 |
| 11 | Inception | 31 |
| 12 | Bohemian Rhapsody | 31 |
| 13 | The Da Vinci Code | 31 |
| 14 | Inception | 31 |
| 15 | The Godfather | 31 |
| 16 | The Matrix | 31 |

12. Gunakan operasi pivoting untuk menampilkan jumlah buku yang dipinjam per bulan dalam tahun terakhir

```
SELECT
    Title,
    [1] AS Januari,
    [2] AS Februari,
    [3] AS Maret,
    [4] AS April,
    [5] AS Mei,
    [6] AS Juni,
    [7] AS Juli,
    [8] AS Agustus,
    [9] AS September,
    [10] AS Oktober,
    [11] AS November,
    [12] AS Desember
FROM (
    SELECT
        Title,
        MONTH(LoanDate) AS Bulan
    FROM Loans
        JOIN Books ON Loans.BookID = Books.BookID
    WHERE YEAR(LoanDate) = 2023
) AS SourceTable
PIVOT (
    COUNT(Bulan)
    FOR Bulan IN ([1], [2], [3], [4],  [5],  [6],
                  [7], [8], [9], [10], [11], [12])
) AS PivotTable;
```

| | Title | Januari | Februari | Maret | April | Mei | Juni | Juli | Agustus | September | Oktober | November | Desember |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Bohemian Rhapsody | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Dumb and Dumber | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | Eternal Sunshine of the Spotless Mind | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | Finding Nemo | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | Inception | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | Jurassic Park | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | Les Misérables | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | Planet Earth | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | Sherlock Holmes | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | Steve Jobs: The Biography | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | The Da Vinci Code | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | The Godfather | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | The Imitation Game | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | The Incredibles | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15 | The Lord of the Rings | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16 | The Matrix | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17 | The Shawshank Redemption | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | The Shining | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |