Kathmandu University

Department of Computer Science and Engineering

Dhulikhel, Kavrepalanchowk

A report on

"Lab Work 02"

Sub Code: COMP 232

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Submission Date: 2022/02/23

Lab2 Tasks

1. Install MySQL (Links to an external site.) or MariaDB (Links to an external site.) on your computer.
2. Install MySQL Workbench (Links to an external site.) or HeIDiSQL (Links to an external site.) (on Windows only) or DBeaver (Links to an external site.).
3. Create a schema.
4. Write a DDL script for creating the tables corresponding to your ER model of Lab 1.
5. Populate the tables with some data.
6. Write queries in relational algebra and SQL for the following:
    1. Find the Name of all publishedBooks.
    2. Find the Name of allBooks published before 2000.
    3. Get the details of theBooks written by a particular Author.
    4. Find the Name of all weekly publications.
    5. Find the Name of pre-orderedBooks.
    6. Get the details of all publications with the Name starting with an 'A'.
    7. Find all the Orders for a particular book. The result must be sorted based on the order Date.

Solution:

After creating Schema, writing DDL script for creating tables and populating tables with some data, written queries in relational algebra and SQL for the following:

1. Find the Name of all publishedBooks.

Relational Algebra:

$$\pi_{Title,\ printDate}\sigma_{\ printDate\ <\text{"curDate()"}}(\text{prints}\bowtie_{bookPrint.printID\ =\ prints.printID} bookPrint \bowtie_{Books.ISBN\ =\ bookPrint.ISBN} Books)$$

SQL Query:

```
3      -- 1 Find the name of all published books
4      SELECT Title, printDate FROM prints
5      JOIN bookprint
6      ON
7      bookprint.printID = prints.PrintID
8      JOIN Books
9      ON
10     Books.ISBN = bookprint.ISBN
11     WHERE
12     PrintDate < curdate();
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Title	printDate
The Kite Runner	2021-11-10
Muna Madan	2019-01-10
Annie Besant: An Autobiography	2022-01-01
Differential Mathematics	2021-12-28
Probability and Statistics	1899-11-11
Dawn till Dusk	2005-12-07
Karnali Blues	2004-04-05
Sirishko Phool	1991-08-02
China Harayeko Manchhe	1998-10-01
AnneFrank:Diary	1999-12-28

2. Find the Name of allBooks published before 2000.

Relational Algebra:

$$\pi_{Title,\ printDate}\sigma_{\ printDate\ <\text{"2000-01-01"}}(\text{prints}\bowtie_{bookPrint.printID\ =\ prints.printID}bookPrint\bowtie_{Books.ISBN\ =\ bookPrint.ISBN}Books)$$

SQL Query:

```
14      -- 2  Find the name of all books published before 2000.
15      SELECT Title, printDate FROM prints
16      JOIN bookprint
17      ON
18      bookprint.printID = prints.PrintID
19      JOIN Books
20      ON
21      Books.ISBN = bookprint.ISBN
22      WHERE
23      PrintDate < '2000-01-01';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Title	printDate
Probability and Statistics	1899-11-11
Sirishko Phool	1991-08-02
China Harayeko Manchhe	1998-10-01
AnneFrank:Diary	1999-12-28

3. Get the details of theBooks written by a particular Author.

Relational Algebra:

$\pi_{Books.ISBN,\ Title,\ Author.name,\ Genre,\ Edition,\ Price}\ \sigma_{name\ =\ "Khim\ Bahadur\ Khatri"}\ (Books \bowtie_{Books.ISBN\ =AuthoredBy.ISBN} AuthoredBy \bowtie_{Author.AuthorID\ =\ AuthoredBy.AuthorID} Author)$

SQL Query:

```
25    -- 3 Get the details of the books written by a particular author.
26    SELECT Books.ISBN,Title,Author.Name,Genre,Edition,price FROM Books
27    JOIN AuthoredBy
28    ON
29    Books.ISBN = AuthoredBY.ISBN
30    JOIN Author
31    ON
32    Author.AuthorID = AuthoredBy.AuthorID
33    WHERE
34    `Name` = 'Khim Bahadur Khatri';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

ISBN	Title	Name	Genre	Edition	price
398140885052	Probability and Statistics	Khim Bahadur Khatri	Mathematics	13th	2000
898140881526	Differential Mathematics	Khim Bahadur Khatri	Mathematics	9th	3500

4. Find the Name of all weekly publications.

Relational Algebra:

$\pi_{Title, genre, publishPeriod}\ \sigma_{publishPeriod = \text{"weekly"}}\ magazine$

SQL Query:

```
21      -- 4 Find the name of all weekly publicatiONs
22      SELECT Title, Genre, PublishPeriod FROM Magazine WHERE PublishPeriod= 'weekly';
23
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Title	Genre	PublishPeriod
Saaptahik	comedy	weekly
Time	comedy	weekly
The Atlantic	Suspense	weekly
Hindustan	Romance	weekly

5. Find the pre-orderedBooks.

Relational Algebra:

$$\gamma_{Title,}(\text{prints} \bowtie_{bookPrint.printID = prints.printID} bookPrint \bowtie_{Orders.Date < prints.printDate} Orders \bowtie_{Books.ISBN = bookPrint.ISBN} Books)$$

SQL Query:

```
40
41 •  SELECT Title FROM prints
42    JOIN
43    bookprint
44    ON
45    bookprint.PrintID = prints.PrintID
46    JOIN
47    Orders
48    ON
49    Orders.Date < prints.PrintDate
50    JOIN books
51    ON books.ISBN = bookprint.ISBN
52    GROUP BY Title;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Title
Differential Mathematics
Annie Besant: An Autobiography
Awareness
Python Programming
The Kite Runner

6. Get the details of all publications with the Name starting with an ‘A’.

Relational Algebra:

$\sigma_{Title\ LIKE\ "A\%"} Books$

SQL QUERY:

```
54      -- 6 Get the details of all publicatiONs with the name starting with an 'A'
55 •    SELECT * FROM Books WHERE Title LIKE 'A%';
```

Result Grid | Filter Rows: | Edit: | Export/Import:

ISBN	Title	Genre	Edition	Price
78140885075	AnneFrank:Diary	AutoBiography	1st	100
316755885025	Awareness	Social	7th	1500
878131675020	Annie Besant: An Autobiography	Auto-Biography	1st	1135

7. Find all the Orders for a particular book. The result must be based on the order Date.

Relational Algebra:

$\tau_{Orders.Date} \pi_{Date, Title, Booksquantity} (Orders \bowtie_{Orders.orderNumber = bookOrder.orderNumber} bookOrder \bowtie_{Books.ISBN = bookOrder.ISBN\ AND\ Books.Title = \text{"The Kite Runner"}} Books)$

SQL Query:

```
57    -- 7 Find all the orders for a particular book.The result must be sorted based ON the order date
58    SELECT `Date`,Title, BooksQuantity FROM Orders
59    JOIN bookOrder
60    ON
61    Orders.orderNumber = bookOrder.orderNumber
62    JOIN Books
63    ON
64    Books.ISBN = bookOrder.ISBN
65    AND
66    Books.Title = "The Kite Runner"
67    ORDER BY Orders.`Date`;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Date	Title	BooksQuantity
2021-10-10	The Kite Runner	1000
2021-12-10	The Kite Runner	200
2022-01-10	The Kite Runner	100