# Prompt A

# Create a schema

CREATE SCHEMA `library`;

# Select the created schema

USE library;

# Create the tables and define constraints and relationships

CREATE TABLE Author (

AuthorID INT PRIMARY KEY,

AuthorFirstName VARCHAR(40),

AuthorLastName VARCHAR(40),

AuthorNationality VARCHAR(40)

);

CREATE TABLE Client (

ClientID INT PRIMARY KEY,

ClientFirstName VARCHAR(40),

ClientLastName VARCHAR(40),

ClientDOB YEAR,

Occupation VARCHAR(40)

);

CREATE TABLE Book (

BookID INT PRIMARY KEY,

BookTitle VARCHAR(40),

AuthorID INT,

Genre VARCHAR(40),

FOREIGN KEY (AuthorID) REFERENCES Author(AuthorID)

);

CREATE TABLE Borrower (

BorrowID INT PRIMARY KEY,

ClientID INT,

BookID INT,

BorrowDate DATE,

FOREIGN KEY (BookID) REFERENCES Book(BookID),

FOREIGN KEY (ClientID) REFERENCES Client(ClientID)

);

# Prompt B

# Populate the Author table with data

INSERT INTO Author (AuthorID, AuthorFirstName, AuthorLastName, AuthorNationality)

VALUES

(1, 'Sofia', 'Smith', 'Canada'),

(2, 'Maria', 'Brown', 'Brazil'),

(3, 'Elena', 'Martin', 'Mexico'),

(4, 'Zoe', 'Roy', 'France'),

(5, 'Sebastian', 'Lavoie', 'Canada'),

(6, 'Dylan', 'Garcia', 'Spain'),

(7, 'Ian', 'Cruz', 'Mexico'),

(8, 'Lucas', 'Smith', 'USA'),

(9, 'Fabian', 'Wilson', 'USA'),

(10, 'Liam', 'Taylor', 'Canada'),

(11, 'William', 'Thomas', 'Great Britain'),

(12, 'Logan', 'Moore', 'Canada'),

(13, 'Oliver', 'Martin', 'France'),

(14, 'Alysha', 'Thompson', 'Canada'),

(15, 'Isabelle', 'Lee', 'Canada'),

(16, 'Emily', 'Clark', 'USA'),

(17, 'John', 'Young', 'China'),

(18, 'David', 'Wright', 'Canada'),

(19, 'Thomas', 'Scott', 'Canada'),

(20, 'Helena', 'Adams', 'Canada'),

(21, 'Sofia', 'Carter', 'USA'),

(22, 'Liam', 'Parker', 'Canada'),

(23, 'Emily', 'Murphy', 'USA');

# Populate the Author table with data

INSERT INTO Book (BookID, BookTitle, AuthorID, Genre)

VALUES

(1, 'Build your database system', 1, 'Science'),

(2, 'The red wall', 2, 'Fiction'),

(3, 'The perfect match', 3, 'Fiction'),

(4, 'Digital Logic', 4, 'Science'),

(5, 'How to be a great lawyer', 5, 'Law'),

(6, 'Manage successful negotiations', 6, 'Society'),

(7, 'Pollution today', 7, 'Science'),

(8, 'A gray park', 2, 'Fiction'),

(9, 'How to be rich in one year', 8, 'Humor'),

(10, 'Their bright fate', 9, 'Fiction'),

(11, 'Black lines', 10, 'Fiction'),

(12, 'History of theater', 11, 'Literature'),

(13, 'Electrical transformers', 12, 'Science'),

(14, 'Build your big data system', 1, 'Science'),

(15, 'Right and left', 13, 'Children'),

(16, 'Programming using Python', 1, 'Science'),

(17, 'Computer networks', 14, 'Science'),

(18, 'Performance evaluation', 15, 'Science'),

(19, 'Daily exercise', 16, 'Well being'),

(20, 'The silver uniform', 17, 'Fiction'),

(21, 'Industrial revolution', 18, 'History'),

(22, 'Green nature', 19, 'Well being'),

(23, 'Perfect football', 20, 'Well being'),

(24, 'The chocolate love', 21, 'Humor'),

(25, 'Director and leader', 22, 'Society'),

(26, 'Play football every week', 20, 'well being'),

(27, 'Maya the bee', 13, 'Children'),

(28, 'Perfect rugby', 20, 'Well being'),

(29, 'The end', 23, 'Fiction'),

(30, 'Computer security', 1, 'Science'),

(31, 'Participate', 22, 'Society'),

(32, 'Positive figures', 3, 'Fiction');

# Populate the Client table with data

INSERT INTO Client (ClientID, ClientFirstName, ClientLastName, ClientDOB, Occupation)

VALUES

(1, 'Kaiden', 'Hill', 2006, 'Student'),

(2, 'Alina', 'Morton', 2010, 'Student'),

(3, 'Fania', 'Brooks', 1983, 'Food Scientist'),

(4, 'Courtney', 'Jensen', 2006, 'Student'),

(5, 'Brittany', 'Hill', 1983, 'Firefighter'),

(6, 'Max', 'Rogers', 2005, 'Student'),

(7, 'Margaret', 'McCarthy', 1981, 'School Psychologist'),

(8, 'Julie', 'McCarthy', 1973, 'Professor'),

(9, 'Ken', 'McCarthy', 1974, 'Securities Clerk'),

(10, 'Britany', 'O''Quinn', 1984, 'Violinist'),

(11, 'Conner', 'Gardner', 1998, 'Licensed Massage Therapist'),

(12, 'Mya', 'Austin', 1960, 'Parquet Floor Layer'),

(13, 'Thierry', 'Rogers', 2004, 'Student'),

(14, 'Eloise', 'Rogers', 1984, 'Computer Security Manager'),

(15, 'Gerard', 'Jackson', 1979, 'Oil Exploration Engineer'),

(16, 'Randy', 'Day', 1986, 'Aircraft Electrician'),

(17, 'Jodie', 'Page', 1990, 'Manufacturing Director'),

(18, 'Coral', 'Rice', 1996, 'Window Washer'),

(19, 'Ayman', 'Austin', 2002, 'Student'),

(20, 'Jaxson', 'Austin', 1999, 'Repair Worker'),

(21, 'Joel', 'Austin', 1973, 'Police Officer'),

(22, 'Alina', 'Austin', 2010, 'Student'),

(23, 'Elin', 'Austin', 1962, 'Payroll Clerk'),

(24, 'Ophelia', 'Wolf', 2004, 'Student'),

(25, 'Eliot', 'McGuire', 1967, 'Dentist'),

(26, 'Peter', 'McKinney', 1968, 'Professor'),

(27, 'Annabella', 'Henry', 1974, 'Nurse'),

(28, 'Anastasia', 'Baker', 2001, 'Student'),

(29, 'Tyler', 'Baker', 1984, 'Police Officer'),

(30, 'Lilian', 'Ross', 1983, 'Insurance Agent'),

(31, 'Thierry', 'Arnold', 1975, 'Bus Driver'),

(32, 'Angelina', 'Rowe', 1979, 'Firefighter'),

(33, 'Marcia', 'Rowe', 1974, 'Health Educator'),

(34, 'Martin', 'Rowe', 1976, 'Ship Engineer'),

(35, 'Adeline', 'Rowe', 2005, 'Student'),

(36, 'Colette', 'Rowe', 1963, 'Professor'),

(37, 'Diane', 'Clark', 1975, 'Payroll Clerk'),

(38, 'Caroline', 'Clark', 1960, 'Dentist'),

(39, 'Dalton', 'Clayton', 1982, 'Police Officer'),

(40, 'Steve', 'Clayton', 1990, 'Bus Driver'),

(41, 'Melanie', 'Clayton', 1987, 'Computer Engineer'),

(42, 'Alana', 'Wilson', 2007, 'Student'),

(43, 'Carson', 'Byrne', 1995, 'Food Scientist'),

(44, 'Conrad', 'Byrne', 2007, 'Student'),

(45, 'Ryan', 'Porter', 2008, 'Student'),

(46, 'Elin', 'Porter', 1978, 'Computer Programmer'),

(47, 'Tyler', 'Harvey', 2007, 'Student'),

(48, 'Arya', 'Harvey', 2008, 'Student'),

(49, 'Serena', 'Harvey', 1978, 'School Teacher'),

(50, 'Lilly', 'Franklin', 1976, 'Doctor'),

(51, 'Mai', 'Franklin', 1994, 'Dentist'),

(52, 'John', 'Franklin', 1999, 'Firefighter'),

(53, 'Judy', 'Franklin', 1995, 'Firefighter'),

(54, 'Katy', 'Lloyd', 1992, 'School Teacher'),

(55, 'Tamara', 'Allen', 1963, 'Ship Engineer'),

(56, 'Maxim', 'Lyons', 1985, 'Police Officer'),

(57, 'Allan', 'Lyons', 1983, 'Computer Engineer'),

(58, 'Marc', 'Harris', 1980, 'School Teacher'),

(59, 'Elin', 'Young', 2009, 'Student'),

(60, 'Diana', 'Young', 2008, 'Student'),

(61, 'Diane', 'Young', 2006, 'Student'),

(62, 'Alana', 'Bird', 2003, 'Student'),

(63, 'Anna', 'Becker', 1979, 'Security Agent'),

(64, 'Katie', 'Grant', 1977, 'Manager'),

(65, 'Joan', 'Grant', 2010, 'Student'),

(66, 'Bryan', 'Bell', 2001, 'Student'),

(67, 'Belle', 'Miller', 1970, 'Professor'),

(68, 'Peggy', 'Stevens', 1990, 'Bus Driver'),

(69, 'Steve', 'Williamson', 1975, 'HR Clerk'),

(70, 'Tyler', 'Williamson', 1999, 'Doctor'),

(71, 'Izabelle', 'Williamson', 1990, 'Systems Analyst'),

(72, 'Annabel', 'Williamson', 1960, 'Cashier'),

(73, 'Mohamed', 'Waters', 1966, 'Insurance Agent'),

(74, 'Marion', 'Newman', 1970, 'Computer Programmer'),

(75, 'Ada', 'Williams', 1986, 'Computer Programmer'),

(76, 'Sean', 'Scott', 1983, 'Bus Driver'),

(77, 'Farrah', 'Scott', 1974, 'Ship Engineer'),

(78, 'Christine', 'Lambert', 1973, 'School Teacher'),

(79, 'Alysha', 'Lambert', 2007, 'Student'),

(80, 'Maia', 'Grant', 1984, 'School Teacher');

# Populate the Borrower table with data

INSERT INTO Borrower (BorrowID, ClientID, BookID, BorrowDate)

VALUES

(1, 35, 17, '2016-07-20'),

(2, 1, 3, '2017-04-19'),

(3, 42, 8, '2016-10-03'),

(4, 62, 16, '2016-04-05'),

(5, 53, 13, '2017-01-17'),

(6, 33, 15, '2015-11-26'),

(7, 40, 14, '2015-01-21'),

(8, 64, 2, '2017-09-10'),

(9, 56, 30, '2017-08-02'),

(10, 23, 2, '2018-06-28'),

(11, 46, 19, '2015-11-18'),

(12, 61, 20, '2015-11-24'),

(13, 58, 7, '2017-06-17'),

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(15, 80, 21, '2018-03-18'),

(16, 51, 23, '2015-09-01'),

(17, 49, 18, '2015-07-28'),

(18, 43, 18, '2015-11-04'),

(19, 30, 2, '2018-08-10'),

(20, 48, 24, '2015-05-13'),

(21, 71, 5, '2016-09-05'),

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(23, 57, 1, '2015-03-17'),

(24, 23, 25, '2017-08-16'),

(25, 20, 12, '2018-07-24'),

(26, 25, 7, '2015-01-31'),

(27, 72, 29, '2016-04-10'),

(28, 74, 20, '2017-07-31'),

(29, 53, 14, '2016-02-20'),

(30, 32, 10, '2017-07-24'),

(31, 12, 15, '2018-04-25'),

(32, 77, 13, '2017-06-09'),

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(34, 37, 24, '2016-01-14'),

(35, 27, 26, '2017-06-05'),

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(39, 17, 19, '2017-03-14'),

(40, 8, 9, '2016-04-22'),

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(45, 17, 4, '2017-04-18'),

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(52, 68, 7, '2016-05-26'),

(53, 37, 26, '2017-02-06'),

(54, 48, 27, '2015-12-30'),

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(56, 29, 8, '2018-04-01'),

(57, 64, 18, '2017-08-29'),

(58, 61, 26, '2018-02-21'),

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(60, 73, 18, '2018-08-22'),

(61, 11, 13, '2018-01-17'),

(62, 45, 6, '2016-07-20'),

(63, 33, 13, '2018-03-18'),

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(77, 27, 25, '2016-08-03'),

(78, 32, 28, '2016-06-15'),

(79, 71, 21, '2017-05-21'),

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(83, 66, 32, '2015-05-30'),

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(86, 65, 4, '2017-08-17'),

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(88, 29, 4, '2017-07-22'),

(89, 44, 9, '2017-12-31'),

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(91, 17, 4, '2015-04-01'),

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(93, 22, 18, '2017-06-22'),

(94, 39, 24, '2015-05-29'),

(95, 63, 14, '2018-01-20'),

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(223, 74, 3, '2015-12-07'),

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(261, 79, 11, '2016-12-11'),

(262, 19, 32, '2016-05-04'),

(263, 35, 11, '2017-08-01'),

(264, 27, 13, '2017-12-15'),

(265, 30, 22, '2015-12-22'),

(266, 8, 7, '2015-06-26'),

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(268, 56, 18, '2016-01-29'),

(269, 13, 19, '2015-03-06'),

(270, 61, 2, '2016-06-18'),

(271, 47, 13, '2017-09-18'),

(272, 30, 22, '2016-02-19'),

(273, 18, 22, '2016-12-31'),

(274, 34, 29, '2017-10-27'),

(275, 32, 21, '2015-06-03'),

(276, 9, 28, '2016-03-30'),

(277, 62, 24, '2015-03-23'),

(278, 44, 22, '2017-04-29'),

(279, 27, 5, '2015-03-25'),

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(281, 5, 13, '2016-12-04'),

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(283, 34, 19, '2016-06-05'),

(284, 35, 5, '2018-02-19'),

(285, 13, 12, '2016-09-23'),

(286, 74, 18, '2016-12-26'),

(287, 70, 31, '2017-08-15'),

(288, 42, 17, '2016-06-15'),

(289, 51, 24, '2018-07-30'),

(290, 45, 30, '2015-01-15'),

(291, 70, 17, '2017-10-07'),

(292, 77, 7, '2017-01-06'),

(293, 74, 25, '2015-09-25'),

(294, 47, 14, '2018-02-01'),

(295, 10, 2, '2017-04-18'),

(296, 16, 21, '2016-10-03'),

(297, 48, 5, '2016-09-17'),

(298, 72, 3, '2017-02-10'),

(299, 26, 23, '2016-03-01'),

(300, 49, 23, '2016-10-25');

# Prompt C

# 1. Display all contents of the Clients table

SELECT \* FROM Client

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# 2. First names, last names, ages and occupations of all clients

SELECT ClientFirstName, ClientLastName, YEAR(CURDATE()) - ClientDOB AS Age, Occupation FROM client

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# 3. First and last names of clients that borrowed books in March 2018

SELECT ClientFirstName, ClientLastName

FROM Client

WHERE ClientID IN (

SELECT ClientID

FROM Borrower

WHERE Month(BorrowDate) = 3 AND Year(BorrowDate) = 2018

);

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# 4. First and last names of the top 5 authors clients borrowed in 2017

SELECT

(SELECT AuthorFirstName FROM Author WHERE Book.AuthorID = Author.AuthorID) AS AuthorFirstName,

(SELECT AuthorLastName FROM Author WHERE Book.AuthorID = Author.AuthorID) AS AuthorLastName

FROM Book WHERE BookID IN (SELECT BOOKID FROM Borrower WHERE YEAR(BorrowDate) = 2017)

GROUP BY Book.AuthorID

ORDER BY COUNT(Book.AuthorID) DESC

LIMIT 5;

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# 5. Nationalities of the least 5 authors that clients borrowed during the years 2015-2017

SELECT

(SELECT AuthorNationality FROM Author Where Book.AuthorID = Author.AuthorID) AS AuthorNationality

FROM BOOK

WHERE BookID IN (SELECT BookID FROM Borrower WHERE YEAR(BorrowDate) BETWEEN 2015 AND 2017)

GROUP BY AuthorNationality

ORDER BY COUNT(AuthorNationality) ASC

LIMIT 5;

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# 6. The book that was most borrowed during the years 2015-2017

SELECT

(SELECT BookTitle FROM Book WHERE Borrower.BookID = Book.BookID) AS BookTitle

FROM Borrower

WHERE YEAR(BorrowDate) BETWEEN 2015 AND 2017

GROUP BY BookTitle ORDER BY COUNT(BookTitle) DESC

LIMIT 1;

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# 7. Top borrowed genres for client born in years 1970-1980

SELECT Book.Genre FROM Book

JOIN Borrower ON Book.BookID = Borrower.BookID

JOIN Client ON Borrower.ClientID = Client.ClientID

WHERE Client.ClientDOB BETWEEN 1970 AND 1980

GROUP BY Book.Genre

ORDER BY COUNT(Book.Genre) DESC

LIMIT 5;

A screenshot of a computer

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# 8. Top 5 occupations that borrowed the most in 2016

SELECT Occupation, COUNT(DISTINCT Client.ClientID) AS ClientCount FROM Client

JOIN Borrower ON Borrower.ClientID = Client.ClientID

WHERE YEAR(BorrowDate) = 2016

GROUP BY Occupation

ORDER BY ClientCount DESC

LIMIT 5;

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# 9. Average number of borrowed books by job title

SELECT Client.Occupation, AVG(BookCount) FROM (SELECT ClientID, COUNT(BookID) AS BookCount FROM Borrower GROUP BY ClientID) AS BorrowCount

JOIN Client ON BorrowCount.ClientID = Client.ClientID

GROUP BY Client.Occupation;

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# 11. The top month of borrows in 2017

SELECT MONTHNAME(BorrowDate) AS MONTH, COUNT(BookID) As BorrowCount FROM BORROWER

WHERE YEAR(BorrowDate) = 2017

GROUP BY BorrowDate

ORDER BY BorrowCount DESC

LIMIT 5;

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