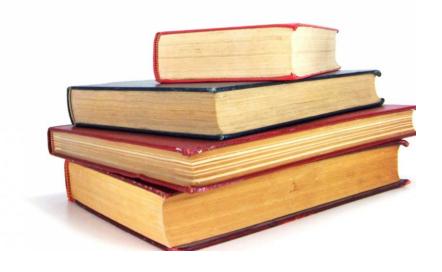


Requirements

The library system helps keep track of a large catalogue of books and supports borrowing and returning them.

The system tracks of who currently has a particular book, as well as if any late fees need to be paid upon its return. The system also has detailed information on each book in the catalogue, a list of employees, and a list of members with their information.

Members can borrow eBooks directly from the system.

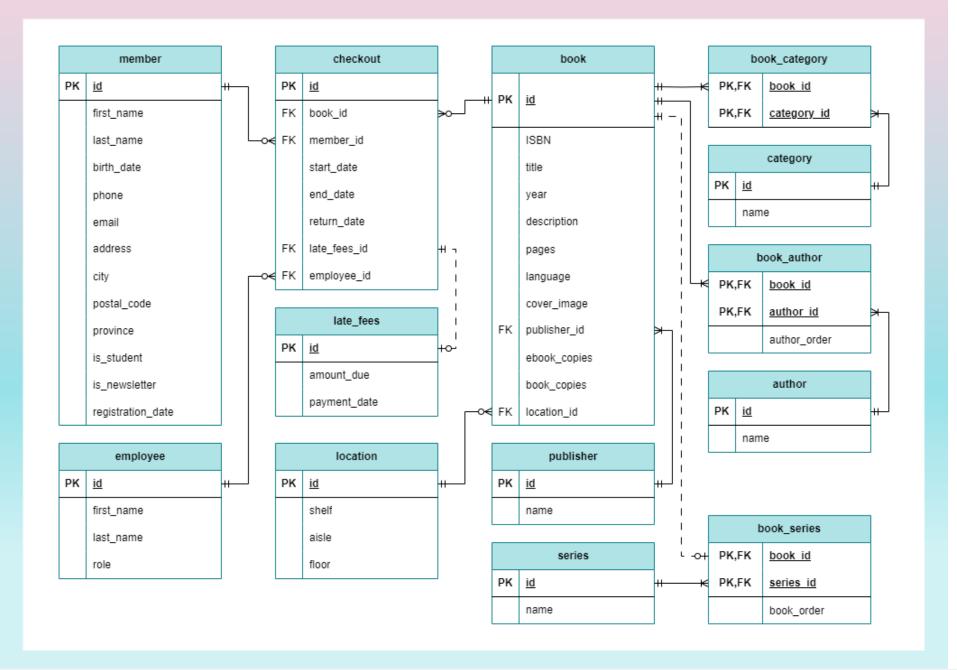


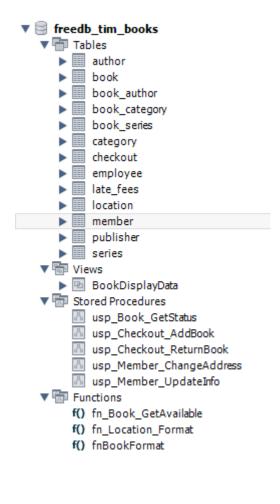


Key Functionalities

- Catalogue Management: Manages detailed book information including authors, categories, titles, publishers, publication years, locations, and available copies.
- Membership Management: Stores members' personal details including names, birthdates, contact information (phone and email), addresses, and subscription status (e.g., student or newsletter).
- Checkout Management:
 - Tracks book borrowing and returns, including due dates.
 - Limits borrowing of physical books by 10 per member at a time, subject to their account status.
 - Returning of eBook automatically upon their checkout's end date.
- Late Fee Management: Tracks overdue book fees and payment deadlines.
- Employee Database: Stores unique employee IDs, names, and roles.









Availability

Book Status

```
DELIMITER //
CREATE PROCEDURE usp_Book_GetStatus(arg_book_id INT)
BEGIN
    SELECT
        fn_Book_GetAvailable(id, TRUE) AS available,
        fn_Location_Format(location_id) AS location,
        (SELECT end date FROM checkout
         WHFRF
             book_id = book.id
             AND employee id <> 1
             AND return_date IS NULL
             ORDER BY end_date
         LIMIT 1) AS earliest return
    FROM book
    WHERE id = arg book id;
END //
DELIMITER;
CALL usp_Book_GetStatus(20);
available location
                                 earliest_return
```

Floor: 0, Aisle: 1, Shelf: 1 2024-05-05

Available formats

```
SELECT
    title,
    `year`,
    fn Book GetAvailable(id, TRUE) AS book avail,
   fn Book GetAvailable(id, FALSE) AS ebook avail
FROM book WHERE id = 29;
```

title	year	book_avail	ebook_avail
Faster Than The Speed of Love	2016	1	0



Checkout a Book

With the following validations:

- A member can borrow 10 books at a time.
- A member can borrow a single copy of a book.
- Their account must be in good standing.

```
DELIMITER //
CREATE PROCEDURE usp Checkout AddBook(arg book id INT, arg member id INT,
arg employee id INT)
BEGIN
    DECLARE val_book_limit TINYINT DEFAULT 10;
    DECLARE val book count TINYINT;
    DECLARE val has book TINYINT;
    DECLARE val fees DECIMAL(5, 2);
    DECLARE error msg VARCHAR(50);
    -- Get the member's currently borrowed books (ignoring ebooks)
    SELECT COUNT(*), SUM(IF(book id = arg book id, 1, 0))
    INTO val book count, val has book
    FROM checkout
    WHERE
        member_id = arg_member_id
        AND employee id <> 1
        AND return date IS NULL;
```

```
IF val has book > 0 THEN
        SIGNAL SQLSTATE '45000' SET MESSAGE TEXT = 'Checkout denied. Book already
checked out by this member.';
   ELSEIF val book count = val book limit THEN
        SIGNAL SQLSTATE '45000' SET MESSAGE TEXT = 'Checkout denied. Book limit
reached.';
   END IF;
    -- Get the member's unpaid late fees
   SELECT SUM(amount due) INTO val fees
    FROM checkout
   JOIN late fees ON late fees id = late fees.id
        member_id = arg_member id
       AND payment date IS NULL;
   IF val fees IS NOT NULL THEN
        SET error msg = CONCAT('Checkout denied. Late fees due: ', val fees, '$');
        SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = error_msg;
    END IF:
    -- Error: If there's any checkout that are late and not returned.
    -- Checkout
   INSERT INTO checkout (book id, member id, start date, end date, employee id)
   VALUES (arg book id, arg member id, CURDATE(), DATE ADD(CURDATE(), INTERVAL 14
DAY), arg_employee_id);
   SELECT * FROM checkout WHERE id = LAST INSERT ID();
END //
DELIMITER;
CALL usp Checkout AddBook (8, 2, 6);
     book id member id start date
                                   end date
                                                return date
                                                            late_fees_id employee_id
     8
23
                         2024-05-05 2024-05-19 NULL
                                                            NULL
```



Checkout Highlight

Before

```
-- ensure the member unique book id in current checkout
SELECT COUNT(*) INTO book count FROM checkout
WHERE
   member id = arg member id
   AND employee id <> 1 -- ignore ebooks
   AND book_id = arg_book_id
   AND return date IS NULL
LIMIT 1;
-- unique book id checkout
IF book count > 0 THEN
   SIGNAL SQLSTATE '45000' SET MESSAGE TEXT =
    'Checkout denied. Book already checked out by this member.';
END IF;
-- get the count of member's currently borrowed books
SELECT COUNT(*) INTO book count FROM checkout
WHERE
   member id = arg member id
   AND employee id <> 1 -- ignore ebooks
   AND return date IS NULL
LIMIT book limit;
-- limit of 10 books can be borrowed
IF book count = book limit THEN
   SIGNAL SQLSTATE '45000' SET MESSAGE TEXT =
    'Checkout denied. Book limit reached.';
END IF;
```

After

```
--- Get the member's currently borrowed books (ignoring ebooks)

SELECT COUNT(*), SUM(IF(book_id = arg_book_id, 1, 0))

INTO book_count, has_book

FROM checkout

WHERE

member_id = arg_member_id

AND employee_id <> 1

AND return_date IS NULL;

IF has_book > 0 THEN

SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT =
 'Checkout denied. Book already checked out by this member.';

ELSEIF book_count = book_limit THEN

SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT =
 'Checkout denied. Book limit reached.';

END IF;
```



Return a Book

Generating fees

If the return date is late, generate late fees of 0.50\$/day.

```
DELIMITER //
CREATE PROCEDURE usp Checkout ReturnBook(arg book id INT, arg member id INT)
BEGIN
   DECLARE val today DATE DEFAULT CURDATE();
   DECLARE val late days INT DEFAULT 0;
   DECLARE val fees DECIMAL(5, 2) DEFAULT 0;
   DECLARE val amount per DECIMAL(5, 2) DEFAULT 0.50;
   DECLARE val id INT;
   DECLARE val end date DATE;
   DECLARE insert lfi INT;
    -- Get checkout infos
   SELECT id, end date
   INTO val_id, val_end_date
    FROM checkout
    WHERE
        member_id = arg_member_id
        AND book id = arg book id
        AND return date IS NULL;
```

```
-- Check if the return was late
   SET val late days = DATEDIFF(val today, val end date);
   IF val late days > 0 THEN
       SET val fees = val amount per * val late days;
       INSERT INTO late fees (amount due) VALUES (val fees);
       SET insert lfi = LAST INSERT ID();
    END IF;
    -- Update the checkout entry with return date and late fees if any
    UPDATE checkout
   SET return_date = val_today, late_fees_id = insert_lfi
    WHERE id = val_id;
    SELECT
       member id,
       book id,
       late fees id,
       val late days AS days late,
       val fees AS amount due
    FROM checkout
   WHERE id = val id;
END //
DELIMITER;
CALL usp Checkout ReturnBook (29, 1);
member_id book_id late_fees_id
                                     days_late
                                                amount due
                    29
                                  16
                                                        1.00
```



Catalogue View

Retrieve the complete book catalogue data with:

- Authors and Series
- Available book formats
- Location details



```
CREATE VIEW BookDisplayData AS
    SELECT
        b.id,
        b.ISBN,
        b.title AS 'Title',
       GROUP CONCAT(DISTINCT(a.`name`) ORDER BY ba.author order ASC SEPARATOR
', ') as 'Author(s)',
        GROUP_CONCAT(DISTINCT(c.`name`) ORDER BY c.`name` ASC SEPARATOR ', ')
as 'Category',
        s.`name` AS 'Series',
        b.`description` AS 'Description',
        p.`name` AS 'Publisher''s name',
        b.cover_image AS 'Cover image',
        fnBookFormat(b.id) AS 'Book Format',
        b.pages AS 'Number of pages',
        b.`language` AS 'Language',
        b.`year` AS 'Year',
        fn Location Format(b.location id) AS 'Location'
    FROM book AS b
   LEFT JOIN book author AS ba ON b.id = ba.book id
    LEFT JOIN author AS a ON ba.author_id = a.id
    LEFT JOIN book category AS bc ON b.id = bc.book id
    LEFT JOIN category AS c ON bc.category id = c.id
    LEFT JOIN publisher AS p ON b.publisher id = p.id
    LEFT JOIN book_series AS bs ON b.id = bs.book_id
    LEFT JOIN series AS s ON bs.series id = s.id
   GROUP BY b.id;
```



Catalogue View Data

SELECT * FROM BookDisplayData;

book_i	(ISBN	Title	Author(s)	Category	Series	Description	Publisher's name	Cover image	Book Format	Number Language Ye	ar Location
1	978006231500	7 To Kill a Mockingbird	Harper Lee	Fiction, Historical	To Kill a Mockingbird	The unforgettable novel of a childhood in a	sleHarperCollins Publishers	to-kill-a-mockingbird=1960	Printed books: 3	323 English	1960 Floor: 0, Aisle: 1, Shelf: 1
2	9780062409850	O Go Set a Watchman	Harper Lee	Classics, Fiction	To Kill a Mockingbird	From Harper Lee comes a landmark new n	ove HarperCollins Publishers	go-set-a-watchman-2015.jp	Printed books: 2	278 English	2015 Floor: 0, Aisle: 1, Shelf: 1
3	9780316029193	3 Blood of Elves	Andrzej Sapkowski	Adventure, Fantasy	The Witcher	For over a century, humans, dwarves, gnor	nes Hachette Book Group	blood-of-elves-1960.jpg	eBooks: 1, Printed books: 2	398 English	1960 Floor: 0, Aisle: 1, Shelf: 2
4	978031621913	6 The Time of Contempt	Andrzej Sapkowski	Adventure, Fantasy	The Witcher	Geralt is a witcher: guardian of the innoce	nt; r Hachette Book Group	the-time-of-contempt-1995.	eBooks: 1, Printed books: 2	331 English	1995 Floor: 0, Aisle: 1, Shelf: 2
5	978031621918	1 Baptism of Fire	Andrzej Sapkowski	Adventure, Fantasy	The Witcher	The Wizards Guild has been shattered by a	co Hachette Book Group	baptism-of-fire-1996.jpg	eBooks: 1, Printed books: 1	349 English	1996 Floor: 0, Aisle: 1, Shelf: 2
6	978221130427	6 Moby-Dick or, The Whale	Herman Melville	Classics, Fiction		"It is the horrible texture of a fabric that sh	oul(Harper and Brothers	moby-dick-or-the-whale-18	Printed books: 2	720 English	1851 Floor: 0, Aisle: 1, Shelf: 3
7	978226704609	0 Le Hobbit	J. R. R. Tolkien	Fantasy, Fiction	The Lord of the Rings	Comme tous les hobbits, Bilbo Bessac est	un Houghton Mifflin Harcour	le-hobbit-1937.jpg	eBooks: 2, Printed books: 1	491 French	1937 Floor: 0, Aisle: 1, Shelf: 4
8	9780008376123	The Fellowship of the Ring	J. R. R. Tolkien	Fantasy, Fiction	The Lord of the Rings	One Ring to rule them all, One Ring to find	the Houghton Mifflin Harcour	the-fellowship-of-the-ring-1	eBooks: 5, Printed books: 2	432 English	1954 Floor: 0, Aisle: 1, Shelf: 4
9	978000837613	The Two Towers	J. R. R. Tolkien	Fantasy, Fiction	The Lord of the Rings	One Ring to rule them all, One Ring to find	the Houghton Mifflin Harcour	the-fellowship-of-the-ring-1	eBooks: 3, Printed books: 2	432 English	1954 Floor: 0, Aisle: 1, Shelf: 4
10	979846420547	The Great Gatsby	F. Scott Fitzgerald	Classics, Fiction		The Great Gasby is the tragic tale of the pu	rsui Charles Scribner's Sons	the-great-gatsby	Printed books: 1	180 English	1925 Floor: 0, Aisle: 2, Shelf: 1
11	978140885565	2 Harry Potter and the Philosopher's Stone	J.K. Rowling	Fantasy, Magic	Harry Potter	"Turning the envelope over, his hand tremb	olinį Bloomsbury	harry-potter-and-the-philos	eBooks: 5, Printed books: 2	333 English	1997 Floor: 0, Aisle: 2, Shelf: 2
12	978140884565	Harry Potter and the Chamber of Secrets	J.K. Rowling	Fantasy, Magic	Harry Potter	Ever since Harry Potter had come home for	the Bloomsbury	harry-potter-and-the-chaml	eBooks: 4, Printed books: 2	352 English	1998 Floor: 0, Aisle: 2, Shelf: 2
13	9780316769174	The Catcher in the Rye	J.D. Salinger	Classics, Fiction		Fleeing the crooks at Pencey Prep, he pinb	alls Little, Brown and Compar	the-catcher-in-the-rye-1951	Printed books: 1	277 English	1951 Floor: 0, Aisle: 2, Shelf: 3
14	978030727767	1 The Da Vinci Code	Dan Brown	Magic, Mystery	Robert Langdon	While in Paris on business, Harvard symb	olo{ Doubleday Group	the-da-vinci-code-2003.jpg	eBooks: 5, Printed books: 3	480 English	2003 Floor: 0, Aisle: 2, Shelf: 4
15	978141652479	3 Angels & Demons	Dan Brown	Magic, Mystery	Robert Langdon	When a world, renowned scientist is found	l bri Doubleday Group	angels-demons-2000.jpg	eBooks: 3, Printed books: 2	736 English	2000 Floor: 0, Aisle: 2, Shelf: 4
16	9782709626309	9 Digital Fortress	Dan Brown	Mystery, Thriller		When the National Security Agency's invin	cibl Doubleday Group	digital-fortress-2000.jpg	eBooks: 1, Printed books: 1	510 English	1998 Floor: 0, Aisle: 2, Shelf: 4
17	978030726543	2 The Road	Cormac McCarthy	Fiction, Suspense		A father and his son walk alone through b	ırnı Alfred A. Knopf	the-road-2006.jpg	Printed books: 1	241 English	2006 Floor: 1, Aisle: 1, Shelf: 1
18	978006088328	One Hundred Years of Solitude	Gabriel García Márquez	Fantasy, Fiction		The brilliant, bestselling, landmark novel	hat Editorial Sudamericana	one-hundred-years-of-solit	Printed books: 2	417 English	1970 Floor: 1, Aisle: 1, Shelf: 2
19	9780439568470	0 Welcome to Dead House	R.L. Stine	Fiction, Horror	Goosebumps	Amanda and Josh think the old house they	ha Scholastic	welcome-to-dead-house-19	Printed books: 1	126 English	1992 Floor: 0, Aisle: 1, Shelf: 1
20	9780439626293	3 Monster Blood	R.L. Stine	Fiction, Horror	Goosebumps	Something scary is happening in GOOSEBI	JMF Scholastic	monster-blood-1992.jpg	Printed books: 2	144 English	1992 Floor: 0, Aisle: 1, Shelf: 1
21	978078683865	The Lightning Thief	Rick Riordan	Fantasy, Mythology	Percy Jackson and the Ol	Percy Jackson is about to be kicked out of	boa Disney Hyperion Books	the-lightning-thief-2005.jpg	eBooks: 2, Printed books: 3	377 English	2005 Floor: 0, Aisle: 1, Shelf: 2
22	9780120000319	9 The Sea of Monsters	Rick Riordan	Fantasy, Mythology	Percy Jackson and the Ol	After a year spent trying to prevent a catast	rop Disney Hyperion Books	the-sea-of-monsters-2006.j	eBooks: 2, Printed books: 2	279 English	2006 Floor: 0, Aisle: 1, Shelf: 2
23	9780553588484	4 A Game of Thrones	George R.R. Martin	Fantasy, Fiction	A Song of Ice and Fire	Long ago, in a time forgotten, a preternatu	ral (Bantam	a-game-of-thrones-1996.jpg	Printed books: 2	835 English	1996 Floor: 0, Aisle: 1, Shelf: 3
24	9780553582024	4 A Feast for Crows	George R.R. Martin	Fantasy, Fiction	A Song of Ice and Fire	Crows will fight over a dead man's flesh, a	nd l Bantam	a-feast-of-crows-2005.jpg	Printed books: 1	1060 English	2005 Floor: 0, Aisle: 1, Shelf: 3
25	60234814	The Lion, the Witch and the Wardrobe	C.S. Lewis	Classics, Fantasy, F	The Chronicles of Narnia	Narnia the land beyond the wardrobe do	or, HarperCollins Publishers	the-lion-the-witch-and-the-	Printed books: 7	206 English	1950 Floor: 0, Aisle: 1, Shelf: 4
26	978000720230	Prince Caspian	C.S. Lewis	Classics, Fantasy, F	The Chronicles of Narnia	Narnia where animals talk where tree	s w HarperCollins Publishers	prince-caspian-1951.jpg	Printed books: 2	240 English	1951 Floor: 0, Aisle: 1, Shelf: 4
27	978052177768	1 The Elements of Java™ Style	Allan Vermeulen, Scott W. An	Computer Science	SIGS Reference Library	The Elements of Java Style, written by renov	wne Cambridge: Cambridge U	the-elements-of-java-style-2	eBooks: 5	142 English	2000
28	978052164819	Advanced Object-Oriented Analysis and De	s James J. Odell	Computer Science	SIGS Reference Library	This 1998 book conveys the essence of obj	ect- Cambridge: Cambridge U	advanced-object-oriented-a	eBooks: 5	246 English	1998
29		Faster Than The Speed of Love	Brian Griffin	Fiction		When Roger's father, an elite Air Force Pilo	t, is Pewterschmidt Publishin		Printed books: 1	16 English	2016 Floor: 0, Aisle: 2, Shelf: 2



Added Functionalities

Get books by a category

```
SELECT
    c.`name` as 'Category',
    b.id,
    b.ISBN,
    b.title AS 'Title',
    GROUP CONCAT(DISTINCT(a.`name`) ORDER BY ba.author order ASC SEPARATOR ', ')
as 'Author(s)',
    s.`name` AS 'Series',
    fnBookFormat(b.id) AS 'Book Format'
FROM book AS b
JOIN book author AS ba ON b.id = ba.book id
JOIN author AS a ON ba.author id = a.id
JOIN book category AS bc ON b.id = bc.book id
JOIN category AS c ON bc.category id = c.id
JOIN book series AS bs ON b.id = bs.book id
JOIN series AS s ON bs.series_id = s.id
WHERE c.name LIKE '<a href="#">%fiction%</a>'
GROUP BY b.id;
```

Category	id	ISBN	Title	Author(s)	Series	Book Format
Fiction	1	9780062315007	To Kill a Mockingbird	Harper Lee	To Kill a Mockingbird	Printed books: 3
Fiction	2	9780062409850	Go Set a Watchman	Harper Lee	To Kill a Mockingbird	Printed books: 2
Fiction	7	9782267046090	Le Hobbit	J. R. R. Tolkien	The Lord of the Rings	eBooks: 2, Printed books: 1
Fiction	8	9780008376123	The Fellowship of the Ring	J. R. R. Tolkien	The Lord of the Rings	eBooks: 5, Printed books: 2
Fiction	ç	9780008376130	The Two Towers	J. R. R. Tolkien	The Lord of the Rings	eBooks: 3, Printed books: 2
Fiction	19	9780439568470	Welcome to Dead House	R.L. Stine	Goosebumps	Printed books: 1
Fiction	20	9780439626293	Monster Blood	R.L. Stine	Goosebumps	Printed books: 2
Fiction	23	9780553588484	A Game of Thrones	George R.R. Martin	A Song of Ice and Fire	Printed books: 2
Fiction	24	9780553582024	A Feast for Crows	George R.R. Martin	A Song of Ice and Fire	Printed books: 1
Fiction	25	0060234814	The Lion, the Witch and the Wardrobe	C.S. Lewis	The Chronicles of Narnia	Printed books: 7
Fiction	26	9780007202300	Prince Caspian	C.S. Lewis	The Chronicles of Narnia	Printed books: 2

Get the book formats

```
DELIMITER //
                                                                Book Format
CREATE FUNCTION fnBookFormat(argBookID INT)
                                                                Printed books: 2
RETURNS VARCHAR(50) NOT DETERMINISTIC
BEGIN
   DECLARE bookFormatString VARCHAR(50);
   DECLARE ebook copies var INT;
   DECLARE book copies var INT;
   SELECT ebook copies, book copies
   INTO ebook copies var, book copies var
   FROM book WHERE id = argBookID;
   IF ebook copies var > 0 AND book copies var > 0 THEN
        SET bookFormatString = CONCAT('eBooks: ', ebook copies var, ', Printed
books: ', book copies var);
   ELSEIF ebook_copies_var > 0 THEN
        SET bookFormatString = CONCAT('eBooks: ', ebook copies var);
   ELSEIF book copies var > 0 THEN
        SET bookFormatString = CONCAT('Printed books: ', book copies var);
   ELSE
        SET bookFormatString = 'Unknown format';
    END IF;
   RETURN bookFormatString;
END //
DELIMITER;
SELECT fnBookFormat(20) AS 'Book Format';
```

Added Functionalities

Get the members with unpaid late fees

SELECT `member`.id, `member`.first_name, `member`.last_name, late_fees.amount_due FROM late_fees JOIN checkout ON late_fees.id = checkout.late_fees_id JOIN `member` ON checkout.member_id = `member`.id WHERE late_fees.payment_date IS NULL;

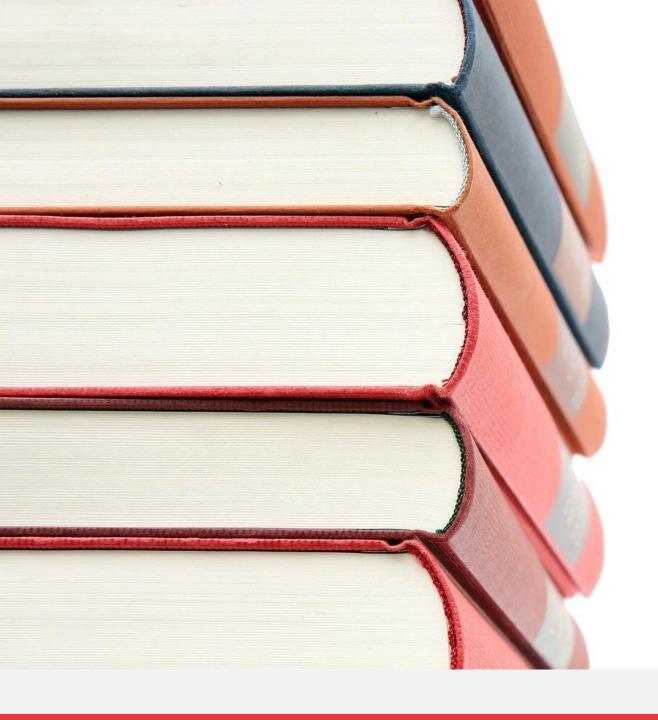
id		first_name	last_name	amount_due
	3	John	Michaels	0.50
	1	John	Doe	1.00

Get books by an author's name

SELECT author.`name`, book.title, book.`description`, book.pages, book.`language`, book.id FROM book JOIN book_author ON book.id = book_author.book_id JOIN author ON book_author.author_id = author.id WHERE author.`name` LIKE '%Tolkien%';

name	title	description	pages	language	id
J. R. R. Tolkien	Le Hobbit	Comme tous les hobbits, Bilbo Bessac est u	491	French	7
J. R. R. Tolkien	The Fellowship of the Ring	One Ring to rule them all, One Ring to find the	432	English	8
J. R. R. Tolkien	The Two Towers	One Ring to rule them all, One Ring to find the	432	English	9





TIM Bo-0ks

ThankYou

Tamara Plante

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Médérick Blouin