NORMALIZED DATABASE

FOR

LIBRARY MANAGEMENT SYSTEM

Book Table

book_id	ISBN_no	title	author	year	copy_no	shelf_id	status
10532	0158360028	abc	xyz	2014	5	B7.2	on hold
10538	0193637472	fgh	ert	2008	8	A5.4	available

Primary Keys: - book_id

The table is in BCNF. We chose BCNF because it reduces data redundancy to a large extent. Here book_id which is the primary key, ensures that all the other non-key attributes are dependent only on it. Also, there is no transitive dependency of any kind.

User Table

user_id	email	password	name	user_type	address	unpaid_fines
abc_12345	abc@xyz.com	*********	abc	student	x street	150.00
yfw_13423	yfw@xyz.com	*********	yfw	faculty	y street	0.00

Primary Keys: - user_id

The table is in BCNF. Again, BCNF was chosen because all the data in the table is completely dependent on the primary key only. Also, primary key ensures that there is no data redundancy.

Librarian Table

lib_id	email	password	name	address
1405892	xyz@lib.in	********	xyz	3rd floor, LRC

Primary Keys: - lib_id

The table is in BCNF too. Here also all the other non-key attributes are fully dependent on lib_id, which is the primary key. Each librarian has an unique id, which can uniquely identify all the records of an individual librarian.

Shelf Table

shelf_id	capacity
A5.7	180
B7.2	210

Primary Keys: - shelf_id

It is also in BCNF, as it is a very simple table where one attribute, which is capacity, is dependent on unqiue shelf_id. There are no other relations between any other attributes.

Book Issue Log Table

issue_id	user_id	book_id	issue_date	return_date
1044	abc_57813	175308	2021-04-05	NULL
1045	anj_14371	185583	2021-04-06	2021-04-09

Primary Keys: - issue_id

This table is also in BCNF, as for every record, there is an unique issue_id, and all other attributes of a record are dependent on this issue_id only.

Reviews Table

review_id	book_id	user_id	text
1004	10532	abc_12345	Not a good book
1005	10489	xyz_12345	Worth Reading

Primary Keys: - review_id

This table is also in BCNF, each record is uniquely identified by a review_id, which is the primary key.

Ratings Table

rating_id	book_id	user_id	value
1004	10532	abc_12345	3
1005	10489	xyz_12345	5

Primary Keys: - rating_id

Ratings Table is also in BCNF. It has a rating_id as primary key for each record. And all the other attributes are dependent on this primary key only

Friend Table

link_id	from_user_id	to_user_id	request_status
102	abc_12345	xyz_45892	requested
103	xyz_12458	bcd_7832	approved

Primary Keys : - link_id, {from_user_id, to_user_id}

Friends table is also in BCNF. It maintains a link_id which uniquely identifies a relation between any two users. Hence the record is fully dependent on primary key only and there is no other dependency.

Hold Requests Table

req_id	user_id	book_id	date
1005	abc_12345	153982	2021-05-31
1006	xyz_15679	154892	2021-06-01
1007	ghi_175328	153982	2021-06-03

Primary Keys : - req_id

This table is also in BCNF. This table stores all the hold requests, each record is identified by a req_id. All the other attributes of a particular record can be known with the help of this req_id.

Bookshelf Table

book_id	user_id	date
157291	abs_15472	2021-04-07
234728	aeu_15327	2021-04-09

Primary Keys : - None

A book_id and user_id can uniquely identify a particular record. Since this table is not of very much importance, we don't have a primary key. The table is in 3NF, if we consider the book_id and user_id combined as super key.