

KHULNA UNIVERSITY

Course Title: Database Systems Project/Fieldwork

Course No: CSE 3102

Library Management
System Project Final
Report



Submitted by:

S M Musfikur Rahman (SID: 190224)

Masud Karim Omi (SID: 200220)

Utsa Debnath (SID : 200242)

3rd year, 1st term

Computer Science and Engineering
Discipline, Khulna University

Submitted to:

Dr. Md. Anisur Rahman

Professor

Computer Science and
Engineering Discipline, Khulna
University

Submission Date : 23-03-2023

NORMALIZATION

STUDENT TABLE

FIRST NORMAL FORM (1NF) :

- The table has a primary key that uniquely identifies each record.
- All attribute values are atomic, meaning they cannot be further divided. So, the table is in 1NF.

SECOND NORMAL FORM (2NF)

- The table already is in 1NF
- All non-key attributes are fully functionally dependent on the primary key. So, the table is in 2NF.

THIRD NORMAL FORM (3NF):

- The table already is in 2NF
- All non-key attributes are not transitively dependent on the primary key.
- So, the table is in 3NF.

LIBRARIAN TABLE

FIRST NORMAL FORM (1NF) :

- The table has a primary key that uniquely identifies each record.
- All attribute values are atomic, meaning they cannot be further divided. So, the table is in 1NF.

SECOND NORMAL FORM (2NF)

- The table already is in 1NF
- All non-key attributes are fully functionally dependent on the primary key. So, the table is in 2NF.

THIRD NORMAL FORM (3NF):

- The table already is in 2NF
- All non-key attributes are not transitively dependent on the primary key.
- So, the table is in 3NF.

BOOKS TABLE

FIRST NORMAL FORM (1NF) :

- The table has a primary key that uniquely identifies each record.
- All attribute values are atomic, meaning they cannot be further divided. So, the table is in 1NF.

SECOND NORMAL FORM (2NF)

- The table already is in 1NF
- All non-key attributes are fully functionally dependent on the primary key. So, the table is in 2NF.

THIRD NORMAL FORM (3NF):

- The table already is in 2NF
- All non-key attributes are not transitively dependent on the primary key.
- So, the table is in 3NF.

BORROWEDBOOKS TABLE

FIRST NORMAL FORM (1NF) :

- The table has a primary key that uniquely identifies each record.
- All attribute values are atomic, meaning they cannot be further divided. So, the table is in 1NF.

SECOND NORMAL FORM (2NF)

- The table already is in 1NF
- All non-key attributes are fully functionally dependent on the primary key. So, the table is in 2NF.

THIRD NORMAL FORM (3NF):

- The table already is in 2NF
- All non-key attributes are not transitively dependent on the primary key.
- So, the table is in 3NF.

RETURNBOOK TABLE

FIRST NORMAL FORM (1NF) :

- The table has a primary key that uniquely identifies each record.
- All attribute values are atomic, meaning they cannot be further divided. So, the table is in 1NF.

SECOND NORMAL FORM (2NF)

- The table already is in 1NF
- All non-key attributes are fully functionally dependent on the primary key. So, the table is in 2NF.

THIRD NORMAL FORM (3NF):

- The table already is in 2NF
- All non-key attributes are not transitively dependent on the primary key.
- So, the table is in 3NF.

LOSTBOOKS TABLE

FIRST NORMAL FORM (1NF) :

- The table has a primary key that uniquely identifies each record.
- All attribute values are atomic, meaning they cannot be further divided. So, the table is in 1NF.

SECOND NORMAL FORM (2NF)

- The table already is in 1NF
- All non-key attributes are fully functionally dependent on the primary key. So, the table is in 2NF.

THIRD NORMAL FORM (3NF):

- The table already is in 2NF
- All non-key attributes are not transitively dependent on the primary key.
- So, the table is in 3NF.

REPORT TABLE

FIRST NORMAL FORM (1NF) :

- The table has a primary key that uniquely identifies each record.
- All attribute values are atomic, meaning they cannot be further divided. So, the table is in 1NF.

SECOND NORMAL FORM (2NF)

- The table already is in 1NF
- The partial dependencies are -
 - borrow_id -> Fine
 - borrow_id -> borrow_date, due_date, and return_date

Create table :

Fine(borrow_id , fine)

Borrow(borrow_id, borrow_date, due_date, and return_date); So, now it is in 2NF.

THIRD NORMAL FORM (3NF):

- The table is in 2NF
- Now, after making it 2NF, All non-key attributes have no transitive dependencies. So, the table is in 3NF.

AFTER THE NORMALIZATION PROCESS, THE NEW SCHEMA WITH THE MODIFIED TABLES WOULD BE:

Student (student_id, student_name , student_email ,year INT, term INT);

Librarian (librarian_id, librarian_name , librarian_email);

Book (book_id, author, publication_year, publisher, book_name, term, edition, category_id,);

BorrowedBooks (borrow_id, student_id, book_id);

Fine (borrow_id,fine);

Borrow (borrow_id, borrow_date, due_date, return_date);

Return_Books (return_id, borrow_id, return_date);

Lost_Books (lost_id, borrow_id, lost_date);

Report (report_id, student_id, librarian_id, book_id, borrow_id);