

Verification for Tables Being in 3NF

Table	Attributes	Determinant (primary key)	Description	3NF
student	student_id, email_address, student_name, phone_number	student_id	-All non-key attributes are fully functionally dependent on determinant(student_id) -No transitive dependencies	Yes
librarybranch	branch_id, branch_name, contact_number, city, postal_code, street_address	branch_id	-All non-key attributes are fully functionally dependent on determinant(branch_id) -Transitive dependency occurred between postal code and city(A specific postal code can determine specific city) -Therefore we removed the transitive dependency by removing the postal code	Yes
university_admin	admin_id, email_address, admin_name, phone_number, branch_id	admin_id	-All non-key attributes are fully functionally dependent on determinant(admin_id) -No transitive dependencies	Yes
author	author_id, author_name	author_id	-All non-key attributes are fully functionally dependent on determinant(author_id) -No transitive dependencies	Yes
book	ISBN, book_title, author_id, publication_year, genre	ISBN	-All non-key attributes are fully functionally dependent on determinant(ISBN) -No transitive dependencies	Yes
can_contain	ISBN, branch_id	ISBN, branch_id	-Only has combined primary key(branch_id, ISBN)	Yes
published	author_id, ISBN	author_id, ISBN	-Only has combined primary key(author id, ISBN)	Yes

part_of	student_id, branch_id	student_id, branch_id	-Only has combined primary key(student_id, branch_id)	Yes
book_fine	fine_id, student_id, status, amount, reason, fine_date	fine_id	-All non-key attributes are fully functionally dependent on determinant(fine_id) -No transitive dependencies	Yes
loan	loan_id, student_id, ISBN, loan_date	loan_id	-All non-key attributes are fully functionally dependent on determinant(loan_id) -No transitive dependencies	Yes

The functional dependencies(→)

student

student_id → email_address, student_name, phone_number

librarybranch

branch_id → branch_name, contact_number, city, street_address

university_admin

admin_id → email_address, admin_name, phone_number, branch_id

author

author_id → author_name

book

ISBN → book_title, author_id, publication_year, genre

can_contain

{ISBN, branch_id} → (for can_contain)

published

{author_id, ISBN} → (for published)

part_of

{student_id, branch_id} → (for part_of)

book_fine

fine_id → student_id, status, amount, reason, fine_date

loan

loan_id → student_id, ISBN, loan_date