1.ASSUMPTIONS

1.1 PUBLISHER

IT consists of publisher\_name,publisher\_id.

1.2 **STAFF**

It holds staff\_address,staff\_name,sttaff\_id,staff\_phone,staff\_designation.

1.3 **BOOKS**

This entity holds ISBN,book\_name,genre,no\_of\_available\_books,book\_prize.

1.4 **ISSUE(STATUS)**

It holds Issue\_id,issue\_date,expiry\_date.

1.5 **RETURN(STATUS)**

It holds Issue\_date,expiry\_date,return\_id

1.6 **DEPARTMENT**

It holds department\_name,department\_id.

1.7 **AUTHOR**

It holds author\_id,author\_name.

1.8 **WRITTEN BY**

It holds author\_id,ISBN.

1.9 **ISSUE(1)**

It holds ISBN,student\_id.

1.10 **STUDENT**

It holds student\_address,date\_expiry,student\_name,student\_email

.

jj

publishedby

PUBLISHER

AUTHOR

LIBRARY

contains

Writen\_by

BOOKS

Issue1

DEPARTMENT

ISSUES(RETURN)

from

Issue2

STUDENT

returned\_by

RETURN

(STATUS)

STAFF

Have

|  |
| --- |
| STUDENT |
| Student\_address |
| Date\_expiry |
| **Student\_id** |
| Student\_name |
| Student\_email |
| Dept\_id |

|  |
| --- |
| ***BOOKS*** |
| **ISBN** |
| Book\_name |
| genre |
| No\_of\_Available\_books |
| Book\_prize  Publisher\_id |

|  |
| --- |
| ISSUE1 |
| ISBN |
| Student\_id |

|  |
| --- |
| DEPARTMENT |
| **Dept**\_id |
| Dept\_name |

|  |
| --- |
| WRITTEN\_BY |
| Author\_id |
| ISBN |

|  |
| --- |
| ISSUE(STATUS) |
| **Issue\_id** |
| ISBN |
| Issue\_date |
| Student\_id |
| Expiry\_date |

|  |
| --- |
| AUTHOR |
| First\_name |
| Middle\_name |
| Last\_name |
| **Authior\_id** |

|  |
| --- |
| RETURN(STATUS) |
| Student\_id |
| **Return\_id** |
| Issue\_date |
| Issue\_id |
| Staff\_id |
| Expiry\_date |
|  |
|  |

|  |
| --- |
| PUBLISHER |
| **Publisher\_id** |
| Publisher\_name |

|  |
| --- |
| STAFF |
| Staff designation |
| Staff phone |
| Staff\_address |
| Staff\_name |
| **Sid** |

# FUNCTIONAL DEPENDENCY AND NORMALIZATION

**\*Here we are assuming that all tables are in 1NF:**

1. BOOK(ISBN ,Book\_name,genre,No\_of\_available\_books,Book\_prize,Publisher\_id)

* FD:

1. ISBN->{Book\_name,No\_of\_available\_Books,Book\_price.Publisher\_id}

2. {ISBN} -->> {Genre }

1. Candidate\_key: ISBN:

It is in 2NF,3NF,BCNF;

NOT IN 4NF

CULPRIT FDS

1. {ISBN} -->> Genre ;

As genre multi-valued ,so it is not in fourth normal form,

We have to divide into two sub-tables

2.STUDENT(Student\_id, Student\_name,Student\_email,Dept\_id, Student\_address,Student\_dept\_name,Date\_of\_expiry)

Student\_id->{Student\_name,Student\_email,Dept\_id,Student\_address,Date\_of\_expiry};

Student\_email>{Student\_name ,Dept\_id,Student\_address,Date\_of\_expiry};

Candidate key is either student\_email or student\_id.

It is in BCNF already.

It is in 1NF,2NF,3NF.

3.ISSUE(STATUS)(Issue\_id,ISBN,Issue\_date,Student\_id,Expiry\_date,)

R1: issue\_id->{ISBN,issue\_date,Student\_id,Expiry\_date };

Candidate keys are issue\_id.

FD;

issue\_id->{ISBN,issue\_date,Student\_id,Expiry\_date };

it is in 1 NF,2NF,3NF and BCNF

it is in 4NF.

4.AUTHOR(Author\_id,First\_name,Middle\_name,Last\_name)

FD:

Author\_id->{First\_name,Middle\_name,Last\_name};

In this ,author\_id is the super key and candidate key determines all other atttributes

It is BCNF already.

it is also in 4NF.

5.WRITTEN\_BY(ISBN,Author\_id)

No Candidate key

All are foreign keys in the table(ISBN,Author\_id are foreign keys)

No need to normalise the table.

6.DEPARTMENT(Department\_id,Department\_name)

FD:Department\_id->Department\_name

It is already in BCNF,1NF,2NF,3NF,4NF;

7.ISSUE1(ISBN,Student\_id)

Here no candidate key:

All are foreign key:(ISBN,Student\_id are foreign\_keys).

Wev don’t need to normalise the ISSUE1 table.

8.RETURN(STATUS)(Student\_id,Return\_id,Issue\_date,Issue\_id,Staff\_id,Expiry\_date)

Return\_id->{Student\_id,issue\_date,Staff\_id,Expiry\_date,issue\_id};

Candidate key is Return\_id ;

It is in 1NF,2NF,3NF,4NF;

9.STAFF(Staff\_id,Staff\_name,Staff\_phone,Staff\_address,Staff\_designation)

Staff\_id->{staff\_name,staff\_phone,staff\_address,staff\_designation};

Candidate\_key is staff\_id;

IT IS IN 1NF,2NF,3NF,BCNF;

10.PUBLISHER(Publisher\_id,Publisher\_name)

FD:Publisher\_id ->Publisher\_name

It is already in BCNF

(as publisher\_id is candidate

create table department(dept\_id varchar(20),dept\_name varchar(20),primary key(dept\_id));

create table publisher(pub\_id varchar(20),pub\_name varchar(20),primary key(pub\_id));

create table author(author\_id varchar(20),first\_name varchar(20),middle\_name varchar(20),last\_name varchar(20),primary key(author\_id));

create table student(student\_address varchar(20),student\_name varchar(20),student\_id varchar(20),student\_email varchar(20),date\_expiry date,primary key(student\_id),dept\_id varchar(20),foreign key(dept\_id) references department(dept\_id));

create table books2(ISBN varchar(20),genre varchar(20),primary key(ISBN));

create table books1(ISBN varchar(20),pub\_id varchar(20),no\_of\_available\_books int,book\_name varchar(20),book\_prize int,primary key(ISBN),foreign key(pub\_id) references publisher(pub\_id));

create table written\_by(author\_id varchar(20),ISBN varchar(20),foreign key(author\_id) references author(author\_id),foreign key(ISBN) references books1(ISBN));

create table issue1(ISBN varchar(20),student\_id varchar(20),foreign key(student\_id) references student(student\_id),foreign key(ISBN) references books1(ISBN));

create table issuestatus(issue\_id varchar(20),ISBN varchar(20),issue\_date date,student\_id varchar(20),expiry\_date date,primary key(issue\_id),foreign key(ISBN) references books1(ISBN),foreign key(student\_id) references student(student\_id));

create table staff(staff\_id varchar(20),staff\_designation varchar(20),staff\_phone varchar(20),staff\_address varchar(20),staff\_name varchar(20),primary key(staff\_id));

create table returnstatus(student\_id varchar(20),return\_id varchar(20),issue\_id varchar(20),staff\_id varchar(20),expiry\_date date,foreign key(student\_id) references student(student\_id),foreign key(staff\_id) references staff(staff\_id),primary key(return\_id),foreign key(issue\_id) references issuestatus(issue\_id));

insert into department values('CSE123','CSE');

insert into department values('MME111','MME');

insert into department values('CE119','CE');

insert into department values('BT117','BT');

insert into department values('ECE115','ECE');

insert into department values('EEE114','EEE');

insert into publisher values('P101','MAHEHBHATT');

insert into publisher values('p102','einstein');

insert into publisher values('p119','albert');

insert into publisher values('p103','chetan');

insert into publisher values('p104','philips');

insert into publisher values('p105','khanna');

insert into author values('AR201','NIRAV','P','PATEL');

insert into author values('AR205','HARSHA','R','REDDY');

insert into author values('AR207','MAHESH','M','BHATT');

insert into author values('AR307','PRETTAM','BILLA','REDDY');

insert into author values('AR202','CHETAN','S','BHAGAT');

insert into author values('AR319','ROHAN','A','AMBATI');

INSERT INTO books2 VALUES('3886502204','HISTORY');

INSERT INTO books2 VALUES('616515264','MATHS');

INSERT INTO books2 VALUES('7172685000','SCIENCE');

INSERT INTO books2 VALUES('777285110','BIOLOGY');

INSERT INTO books2 VALUES('892218172','ASTROLOGY');

INSERT INTO books2 VALUES('388950204','ROMANCE');

create table department(dept\_id varchar(20),dept\_name varchar(20),primary key(dept\_id));

desc department;

create table publisher(pub\_id varchar(20),pub\_name varchar(20),primary key(pub\_id));

create table author(author\_id varchar(20),first\_name varchar(20),middle\_name varchar(20),last\_name varchar(20),primary key(author\_id));

create table student(student\_address varchar(20),student\_name varchar(20),student\_id varchar(20),student\_email varchar(20),date\_expiry date,primary key(student\_id),dept\_id varchar(20),foreign key(dept\_id) references department(dept\_id));

create table books2(ISBN varchar(20),genre varchar(20),primary key(ISBN));

create table books1(ISBN varchar(20),pub\_id varchar(20),no\_of\_available\_books int,book\_name varchar(20),book\_prize int,primary key(ISBN),foreign key(pub\_id) references publisher(pub\_id));

create table written\_by(author\_id varchar(20),ISBN varchar(20),foreign key(author\_id) references author(author\_id),foreign key(ISBN) references books1(ISBN));

create table issue1(ISBN varchar(20),student\_id varchar(20),foreign key(student\_id) references student(student\_id),foreign key(ISBN) references books1(ISBN));

create table issuestatus(issue\_id varchar(20),ISBN varchar(20),issue\_date date,student\_id varchar(20),expiry\_date date,primary key(issue\_id),foreign key(ISBN) references books1(ISBN),foreign key(student\_id) references student(student\_id));

create table staff(staff\_id varchar(20),staff\_designation varchar(20),staff\_phone varchar(20),staff\_address varchar(20),staff\_name varchar(20),primary key(staff\_id));

create table returnstatus(student\_id varchar(20),return\_id varchar(20),issue\_id varchar(20),staff\_id varchar(20),expiry\_date date,foreign key(student\_id) references student(student\_id),foreign key(staff\_id) references staff(staff\_id),primary key(return\_id),foreign key(issue\_id) references issuestatus(issue\_id));

insert into department values('CSE123','CSE');

insert into department values('MME111','MME');

insert into department values('CE119','CE');

insert into department values('BT117','BT');

insert into department values('ECE115','ECE');

insert into department values('EEE114','EEE');

desc department;

insert into publisher values('P101','MAHEHBHATT');

insert into publisher values('p102','einstein');

insert into publisher values('p119','albert');

insert into publisher values('p103','chetan');

insert into publisher values('p104','philips');

insert into publisher values('p105','khanna');

desc publisher;

select \* from books1;

insert into author values('AR201','NIRAV','P','PATEL');

insert into author values('AR205','HARSHA','R','REDDY');

insert into author values('AR207','MAHESH','M','BHATT');

insert into author values('AR307','PRETTAM','BILLA','REDDY');

insert into author values('AR202','CHETAN','S','BHAGAT');

insert into author values('AR319','ROHAN','A','AMBATI');

INSERT INTO books2 VALUES('3886502204','HISTORY');

INSERT INTO books2 VALUES('616515264','MATHS');

INSERT INTO books2 VALUES('7172685000','SCIENCE');

INSERT INTO books2 VALUES('777285110','BIOLOGY');

INSERT INTO books2 VALUES('892218172','ASTROLOGY');

INSERT INTO books2 VALUES('388950204','ROMANCE');

desc books1;

insert into student value('X','Nirav Pr','851827','nirav7800@gmail.com','2022-10-02','CSE123');

insert into student value('Y','SRUJAN r','851807','srujan7@gmail.com','2023-09-01','CSE123');

insert into student value('X','MAHESH P','851847','m7800@gmail.com','2022-12-11','MME111');

insert into student value('X','KAUSHIK BarO','851966','kb56900@gmail.com','2021-01-01','CE119');

insert into student value('E','Raghu nagam','851877','raghu@gmail.com','2029-11-11','BT117');

insert into student value('H','Harsha k','971211','h133n@gmail.com','2021-12-21','ECE115');

INSERT into books1 values('388650204','P101',5,'MAHABHARAT',570);

INSERT into books1 values('717285000','P101',15,'PHYSICS11',1110);

iNSERT into books1 values('892218172','P102',115,'ASTROFORYOURLIFE',220);

INSERT into books1 values('777285110','P102',110,'ANIMALS',1000);

INSERT into books1 values('616515264','P119',0,'BSGREWAL',999);

insert into issuestatus values('LB1123','388650204','2020-12-12','851827','2021-12-01');

insert into issuestatus values('LB1173','717285000','2020-11-13','851827','2021-12-18');

insert into issuestatus values('LB0011','892218172','2020-09-10','851847','2021-11-15');

insert into issuestatus values('LB1705','777285110','2020-01-15','851877','2021-03-15');

insert into issuestatus values('LB1109','616515264','2020-02-16','851827','2021-03-15');

insert into issue1 values('388650204','851827');

insert into issue1 values('616515264','851827');

insert into issue1 values('717285000','851827');

insert into issue1 values('777285110','851877');

insert into issue1 values('892218172','851847');

insert into written\_by values('AR201','388650204');

insert into written\_by values('AR207','616515264');

insert into written\_by values('AR207','717285000');

insert into written\_by values('AR319','777285110');

insert into written\_by values('AR207','892218172');

insert into staff values('ss112','LIBRARIAN','9824869742','M','MADHUMATI');

insert into staff values('ss512','ASISTANT LIBRARIAN','9824909742','N','NARANANA');

insert into staff values('ss666','LIBRARIAN','88248969742','O','MEGHNA');

insert into staff values('ss672','LIBRARY MANAGER','8824869742','P','RAGHURAM');

insert into staff values('ss778','CLERK','9824899742','Q','RAJU');

insert into RETURNstatus values('851827','RD101','LB1123','SS112','2021-12-01');

insert into RETURNstatus values('851827','RD111','LB1173','SS112','2021-12-18');

insert into RETURNstatus values('851847','RD112','LB0011','SS512','2021-11-15');

insert into RETURNstatus values('851877','RD119','LB1705','SS112','2021-03-15');

insert into RETURNstatus values('851827','RD117','LB1109','SS666','2021-03-15');