Project: Library Management System

In a library management system:

Authors are identified by Author_id and their name, country,nationality, phone_no must be recorded.

A publishing event associates an author with multiple publishers.

Publishers have a unique publish ISBN and their name, email must be recorded.

A publisher publishes multiple books. However, two same books can not be published by different publishers.

Books are identified by ISBN, book tittle , publish year, language type, availability must be recorded.

A book has bound by a unique cover. Each cover has a unique cover_id and cover_name,cover_type must be recorded. Multiple books can not be bound by same cover

That cover helps to indicate the category of the books. Multiple covers may be indicated multiple categories.however two different categories can not be indicated by same cover

Categories are identified by category_id and category_type should be recorded.

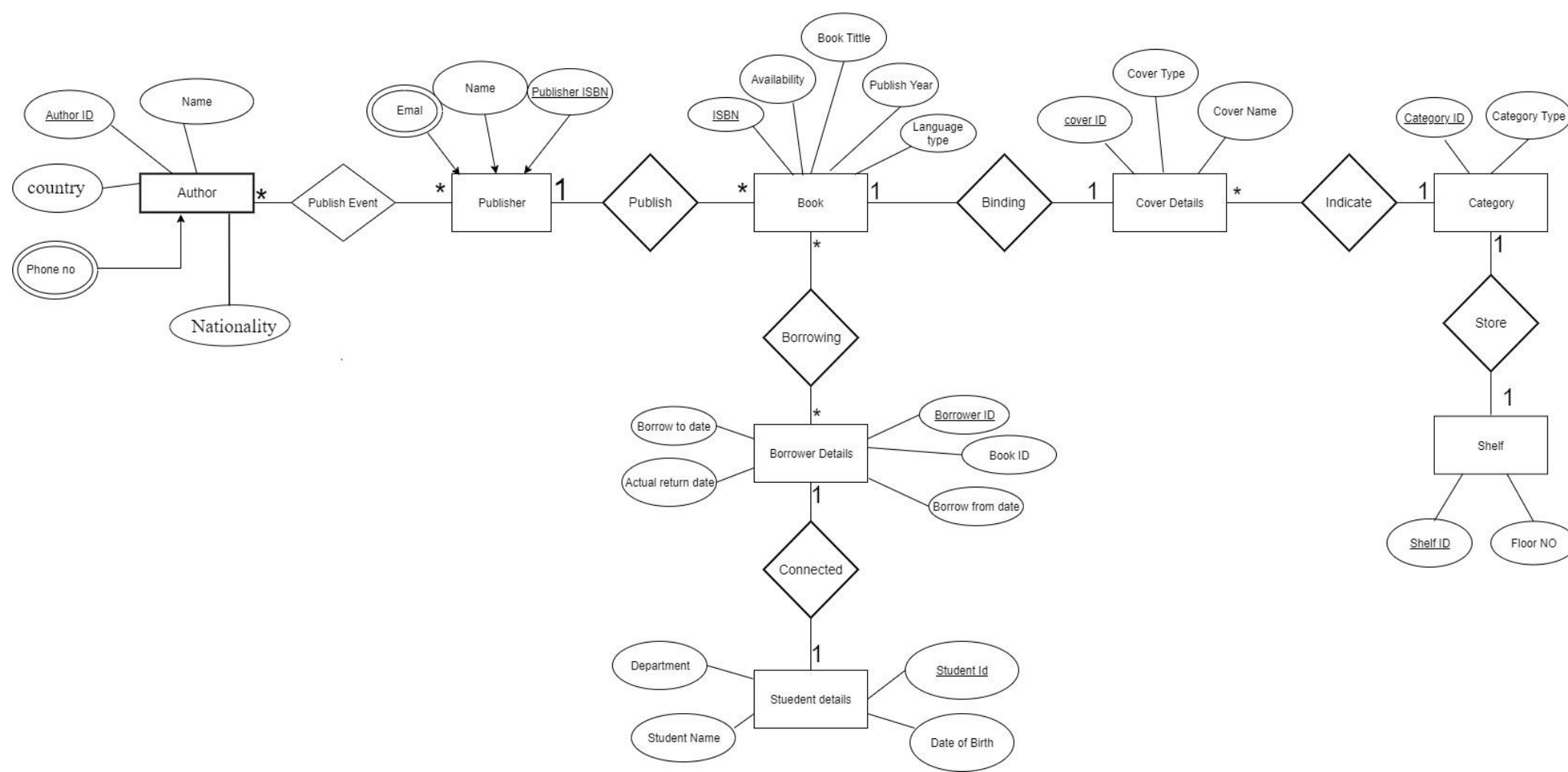Shelf is identified by Shelf_id and floor_no should be recorded.

A shelf can store some type of categories books. However, two different categories can not be store on the same shelf.

Borrower details have a unique borrowed_id, book_id, borrow from date,borrow to date, actual return date must be recorded. A borrower can borrow multiple books.

Students are identified by student_id and date of birth, student_name, department must be recorded.

Each borrower must be a student. Two different students can not be the same borrower.

ER-DIAGRAM

NORMALIZATION

Publish event – Author ID, Name, Phone no, Publisher ISBN, Publisher name, email

1st NF -Phone no and email are the multivalued attribute.

2nd NF – Author Id, name, Phone no

 Publisher ISBN, Publisher name, email.

3rd NF –

Author ID, Name, Phone no

C_ID, Country,Nationality

Publisher ISBN, Publisher name, email

Table for published event –

1. Author ID, Name,C_ID
2. C_ID, Country,Nationality
3. Author ID, Phone no
4. Publisher ISBN, Publisher name
5. Publisher ISBN, email
6. Contract no, Author Id, Publisher ISBN

Publish – (Publisher ISBN, Publisher name, email, Book ISBN, Book title, Publish year, Language type, Availability)

1st NF - Email is a multivalued attribute.

2nd NF – Publisher ISBN, Publisher name, email

 Book ISBN, Book title, Publish year, Language type, Availability.

3rd NF – No transitive dependency.

Publisher ISBN, Publisher name, email

Book ISBN, Book title, Publish year, Language type, Availability

Table for publish –

1. Publisher ISBN, Publisher name.
2. Publisher ISBN, Email.
3. Book ISBN, Book title, Publish year, Language type, Availability, Publisher ISBN.

Binding – (Book ISBN, Book title, Publish year, Language type, Availability, Cover Id, Cover type, Cover name).

1st NF - No multivalued attribute.

2nd NF – Book ISBN, Book title, Publish year, Language type, Availability

Cover Id, Cover type, Cover name

3rd NF – No transitive dependency.

  Book ISBN, Book title, Publish year, Language type, Availability

 Cover Id, Cover type, Cover name

Table for binding –

1. Book ISBN, Book title, Publish year, Language type, Availability.
2. Cover Id, Cover type, Cover name.
3. Cover Id, Cover type, Cover name, Book ISBN.

Borrowing - Book ISBN ,Availability, Book title, Publish year, Language type Borrower Id, Book Id, Borrow from date, Borrow to date, Actual return date.

1st NF – No multivalued attribute.

2nd NF - Book ISBN, Availability, Book title, Publish year, Language type

Borrower Id, Book Id, Borrow from date, Borrow to date, Actual return date.

3rd NF – No transitive dependency.

  Book ISBN, Availability, Book title, Publish year, Language type

Borrower Id, Book Id, Borrow from date, Borrow to date, Actual return date

Table for borrowing –

1. Book ISBN, Availability, Book title, Publish year, Language type.
2. Borrower Id, Book Id, Borrow from date, Borrow to date, Actual return date.
3. NID, Book ISBN, Borrower Id.

Connected - Borrower Id, Book Id, Borrow from date, Borrow to date, Actual return date, Student Id, Date of birth, Department, Student name.

1st NF – No multivalued attribute.

2nd NF – Borrower Id, Book Id, Borrow from date, Borrow to date, Actual return date,

Student Id, Date of birth, Department, Student name.

3rd NF – No transitive dependency.

Borrower Id, Book Id, Borrow from date, Borrow to date, Actual return date,

Student Id, Date of birth, Department, Student name.

Table for connected –

1. Borrower Id, Book Id, Borrow from date, Borrow to date, Actual return date.
2. Student Id, Date of birth, Department, Student name, Borrower Id.

Indicate – (Cover Id, Cover type, Cover name, Category Id, Category type)

1st NF – No multivalued attribute.

2nd NF – Cover Id, Cover type, Cover name

Category Id, Category type.

3rd NF – No transitive dependency.

Cover Id, Cover type, Cover name

Category Id, Category type.

Table for Indicate –

1. Cover Id, Cover type, Cover name, Category Id.
2. Category Id, Category type.

Store - Category Id, category type, Shelf Id, Floor no.

1st NF - No multivalued attribute.

2nd NF - Category Id, category type

Shelf Id, Floor no.

3rd NF – No transitive dependency.

Category Id, category type

Shelf Id, Floor no

Table for Store –

1. Category Id, category type, Shelf Id.
2. Shelf Id, Floor no.

Final table list:

1. Author ID, Name, C_ID: author_figure
2. C_ID, Country, Nationality: author_identity
3. Author ID, Phone no: author_ contact
4. Publisher ISBN, Publisher name :publisher_identity
5. Publisher ISBN, email: publisher_contact
6. Contract no, Author Id, Publisher ISBN: contract_file
7. Book ISBN, Book title, Publish year, Language type, Availability, Publisher ISBN: book_details
8. Cover Id, Cover type, Cover name, Book ISBN: cover_details
9. Borrower Id, Book Id, Borrow from date, Borrow to date, Actual return date: borrower_details
10. NID, Book ISBN, Borrower Id : borrower_file
11. Student Id, Date of birth, Department, Student name, Borrower Id : student_details
12. Cover Id, Cover type, Cover name, Category Id : co_ca_details
13. Category Id, category type, Shelf Id: category_details
14. Shelf Id, Floor no.: shelf_identity

TABLE DESCRIBE

Author_figure:

Object Type **TABLE** Object **AUTHOR_FIGURE**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
AUTHOR_FIGURE	AUTHOR_ID	Number	-	6	0	1	-	-	-
	NAME	Varchar2	20	-	-	-	✓	-	-
	C_ID	Number	-	6	0	-	✓	-	-
									1 - 3

We are using not null constraint on name

OWNER	CONSTRAINT_NAME	CONSTRAINT_TYPE	TABLE_NAME	SEARCH_CONDITION	R_OWNER	R_CONSTRAINT_NAME	DELETE_RULE	STATUS
SCOTT	CON1	P	AUTHOR_FIGURE	-	-	-	-	ENABLED
SCOTT	CON15	R	AUTHOR_FIGURE	-	SCOTT	CON2	NO ACTION	ENABLED
SCOTT	SYS_C005047	C	AUTHOR_FIGURE	"NAME" IS NOT NULL	-	-	-	ENABLED

3 rows returned in 0.00 seconds   CSV Export

Author_identity:

Object Type **TABLE** Object **AUTHOR_IDENTITY**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
AUTHOR_IDENTITY	C_ID	Number	-	6	0	1	-	-	-
	COUNTRY	Varchar2	11	-	-	-	✓	-	-
	NATIONALITY	Varchar2	11	-	-	-	✓	-	-
									1 - 3

Auhtor_contact:

Object Type **TABLE** Object **AUTHOR_CONTACT**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
AUTHOR_CONTACT	AUTHOR_ID	Number	-	6	0	1	-	-	-
	PHONE_NO	Number	-	11	0	2	-	-	-
									1 - 2

Publisher_identity:

Object Type **TABLE** Object **PUBLISHER_IDENTITY**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PUBLISHER_IDENTITY	PUBLISHER_ISBN	Number	-	11	0	1	-	-	-
	PUBLISHER_NAME	Varchar2	20	-	-	-	✓	-	-
									1 - 2

Publisher_contact:

Object Type **TABLE** Object **PUBLISHER_CONTACT**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
PUBLISHER_CONTACT	PUBLISHER_ISBN	Number	-	11	0	1	-	-	-
	EMAIL	Varchar2	20	-	-	2	-	-	-
									1 - 2

We are using unique constraint to make email unique

OWNER	CONSTRAINT_NAME	CONSTRAINT_TYPE	TABLE_NAME	SEARCH_CONDITION	R_OWNER	R_CONSTRAINT_NAME	DELETE_RULE	STATUS
SCOTT	CON5	P	PUBLISHER_CONTACT	-	-	-	-	ENABLED
SCOTT	CON25	U	PUBLISHER_CONTACT	-	-	-	-	ENABLED

2 rows returned in 0.00 seconds   CSV Export

Contract_file:

Object Type **TABLE** Object **CONTRACT_FILE**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CONTRACT_FILE	CONTRACT_NO	Number	-	20	0	1	-	-	-
	AUTHOR_ID	Number	-	6	0	-	✔	-	-
	PUBLISHER_ISBN	Number	-	6	0	-	✔	-	-
									1 - 3

Book_details:

Object Type **TABLE** Object **BOOK_DETAILS**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BOOK_DETAILS	BOOK_ISBN	Number	-	6	0	1	-	-	-
	BOOK_TITLE	Varchar2	30	-	-	-	✔	-	-
	PUBLISH_YEAR	Number	-	4	0	-	✔	-	-
	LANGUAGE_TYPE	Varchar2	6	-	-	-	✔	-	-
	AVAILABILITY	Varchar2	6	-	-	-	✔	-	-
	PUBLISHER_ISBN	Number	-	6	0	-	✔	-	-
									1 - 6

Cover_details:

Object Type **TABLE** Object **COVER_DETAILS**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
COVER_DETAILS	COVER_ID	Number	-	6	0	1	-	-	-
	COVER_TYPE	Varchar2	6	-	-	-	✔	-	-
	COVER_NAME	Varchar2	30	-	-	-	✔	-	-
	BOOK_ISBN	Number	-	6	0	-	✔	-	-
									1 - 4

Borrower_details:

Object Type **TABLE** Object **BORROWER_DETAILS**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BORROWER_DETAILS	BORROWER_ID	Number	-	6	0	1	-	-	-
	BOOK_ID	Number	-	6	0	-	✔	-	-
	BORROW_FROM_DATE	Date	7	-	-	-	✔	-	-
	BORROW_TO_DATE	Date	7	-	-	-	✔	-	-
	ACTUAL_RETURN_DATE	Date	7	-	-	-	✔	-	-
									1 - 5

Borrower_file:

Object Type **TABLE** Object **BORROWER_FILE**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
BORROWER_FILE	NID	Number	-	14	0	1	-	-	-
	BOOK_ISBN	Number	-	11	0	-	✔	-	-
	BORROWER_ID	Number	-	6	0	-	✔	-	-
									1 - 3

Student_details:

Object Type **TABLE** Object **STUDENT_DETAILS**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
STUDENT_DETAILS	STUDENT_ID	Number	-	7	0	1	-	-	-
	DATE_OF_BIRTH	Date	7	-	-	-	✔	-	-
	DEPARTMENT	Varchar2	20	-	-	-	✔	-	-
	STUDENT_NAME	Varchar2	10	-	-	-	✔	-	-
	BORROWER_ID	Number	-	6	0	-	✔	-	-
									1 - 5

Co_ca_details:

Object Type **TABLE** Object **CO_CA_DETAILS**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CO_CA_DETAILS	COVER_ID	Number	-	6	0	1	-	-	-
	COVER_TYPE	Varchar2	6	-	-	-	✔	-	-
	COVER_NAME	Varchar2	30	-	-	-	✔	-	-
	CATEGORY_ID	Number	-	16	0	-	✔	-	-
									1 - 4

Category_details:

Object Type **TABLE** Object **CATEGORY_DETAILS**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CATEGORY_DETAILS	CATEGORY_ID	Number	-	16	0	1	-	-	-
	CATEGORY_TYPE	Varchar2	13	-	-	-	✓	-	-
	SHELF_ID	Number	-	10	0	-	✓	-	-
									1 - 3

Shelf_identity:

Object Type **TABLE** Object **SHELF_IDENTITY**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
SHELF_IDENTITY	SHELF_ID	Number	-	10	0	1	-	-	-
	FLOOR_NO	Number	-	7	0	-	✓	-	-
									1 - 2

#We are using a sequence to generate shelf id from no 5

SEQUENCE_NAME	MIN_VALUE	MAX_VALUE	INCREMENT_BY	CYCLE_FLAG	ORDER_FLAG	CACHE_SIZE	LAST_NUMBER
SHELF_ID_GENERETOR	1	100	1	N	N	0	5

1 rows returned in 0.00 seconds   CSV Export

DATA INPUT

Author_figure:

AUTHOR_ID	NAME	C_ID
101	Jon	201
102	Morgan	202
103	Charles	203
104	Martin	204

4 rows returned in 0.00 seconds   CSV Export

Author_identity:

C_ID	COUNTRY	NATIONALITY
201	America	American
202	England	English
203	Australia	Australian
204	America	American

4 rows returned in 0.00 seconds   CSV Export

Author_contact:

AUTHOR_ID	PHONE_NO
101	9906880
102	3399890
103	44788900
104	69379333

4 rows returned in 0.00 seconds   CSV Export

Publisher_identity:

PUBLISHER_ISBN	PUBLISHER_NAME
301	smith publisher
302	hello book publisher
303	today publisher
304	nitro publisher

4 rows returned in 0.00 seconds   CSV Export

Publisher_contact:

PUBLISHER_ISBN	EMAIL
301	smith@gmail.com
301	smithfive@gmail.com
302	hello@gmail.com
303	today@gmail.com
304	nitro@gmail.com

5 rows returned in 0.00 seconds   CSV Export

Contract_file:

CONTRACT_NO	AUTHOR_ID	PUBLISHER_ISBN
4001	101	301
4002	102	302
4003	103	303
4004	104	304

4 rows returned in 0.00 seconds   CSV Export

Book_details:

BOOK_ISBN	BOOK_TITLE	PUBLISH_YEAR	LANGUAGE_TYPE	AVAILABILITY	PUBLISHER_ISBN
501	Hacking	2001	English	yes	301
502	Java script	2003	English	yes	302
503	Code	2008	English	yes	303
504	The clean coder	2010	English	yes	304

4 rows returned in 0.00 seconds   CSV Export

Cover_details:

COVER_ID	COVER_TYPE	COVER_NAME	BOOK_ISBN
601	Soft	The art of exploitation	501
602	Soft	Enjoy java programming	502
603	Hard	Language of computer hardware	503
604	Hard	A code of conduct	504

4 rows returned in 0.00 seconds   CSV Export

Borrower_details:

BORROWER_ID	BOOK_ID	BORROW_FROM_DATE	BORROW_TO_DATE	ACTUAL_RETURN_DATE
701	5001	01-DEC-20	05-DEC-20	05-DEC-20
703	5003	03-DEC-20	10-DEC-20	10-DEC-20
704	5004	06-DEC-20	13-DEC-20	13-DEC-20
702	5002	06-DEC-20	13-DEC-20	13-DEC-20

4 rows returned in 0.00 seconds   CSV Export

Borrower_file:

NID	BOOK_ISBN	BORROWER_ID
9001	501	701
9002	502	702
9003	503	703
9004	504	703
9005	504	704

5 rows returned in 0.00 seconds   CSV Export

Student_details:

STUDENT_ID	DATE_OF_BIRTH	DEPARTMENT	STUDENT_NAME	BORROWER_ID
7701	14-APR-99	CSE	Kanon	701
7702	20-APR-99	CSE	Shoumik	702
7703	20-APR-00	CSE	Shams	703
7704	03-JAN-00	CSE	Jahid	704

4 rows returned in 0.00 seconds   CSV Export

Co_Ca_details:

COVER_ID	COVER_TYPE	COVER_NAME	CATEGORY_ID
601	Soft	The art of exploitation	11
602	Soft	Enjoy java programming	12
603	Hard	Language of computer hardware	13
604	Hard	A code of conduct	14

4 rows returned in 0.00 seconds   CSV Export

Category_details:

CATEGORY_ID	CATEGORY_TYPE	SHELF_ID
11	Programming	1
12	Java	2
13	Mechanical	3
14	Coding	4

4 rows returned in 0.00 seconds   CSV Export

Shelf_identity:

SHELF_ID	FLOOR_NO
1	1
2	1
3	2
4	2
5	3
6	4

6 rows returned in 0.02 seconds   CSV Exp

<div align="center">

Query Questions

</div>

Subquery:

1.Show the author name who has a contract with 'smith publisher'

Ans:

select name

from author_figure

where author_id=(select author_id

from contract_file

where publisher_isbn=(select publisher_isbn

from publisher_identity

where publisher_name='smith publisher'))

2. Show the book title which cover name should be 'Enjoy java programming'

Ans:

select book_title

from book_details

where book_isbn=(select book_isbn

from cover_details

where cover_name='Enjoy java programming')

Join:

3.Show all student's name and id and the actual return date of their borrowed book

Ans:

select student_id,student_name,actual_return_date

from student_details,borrower_details

where student_details.borrower_id=borrower_details.borrower_id

4. Display every book's category type and which floor to store category wise

Ans:

select category_type,floor_no

from category_details,shelf_identity

where shelf_identity.shelf_id=category_details.shelf_id

Group function:

5.How many programming type books are there in the library?

Ans:

select count(category_type)

from category_details

where category_type='Programming'

6.Show the borrower id who borrowed a book for the most shortest time

Ans:

select borrower_id

from borrower_details

where borrow_to_date-borrow_from_date =

(select min(borrow_to_date-borrow_from_date)

from borrower_details)

Single row fuction:

(case conversion)

7.Show the all inforfation for student 'shams'

Ans:

select *

from student_details
where Lower(student_name)='shams';
(Character manipulation)
8. Display students name ,length of their name and the numeric position of the letter 'a' in their name
Ans:
select student_name,length(student_name),instr(student_name,'a')
from student_details

View:
9. Create a view that shows student's id,student name and their borrowing information like (borrow form date , borrow to date ,actual return date) of a book
Ans:
create or replace view new_employee as
select student_id,student_name,borrow_from_date,borrow_to_date,actual_return_date
from student_details,borrower_details
where student_details.borrower_id=borrower_details.borrower_id

Sequence:
10. create a sequence name shelf_id_generator to generate shelf id squencely
Ans:
create sequence shelf_id_generetor
start with 1
increment by 1
maxvalue 100
nominvalue
nocycle
nocache;