1) Part A:

Project: Library Management System

Group Members:

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2) Table of contents:

3) Overview of the business environment and project overview:

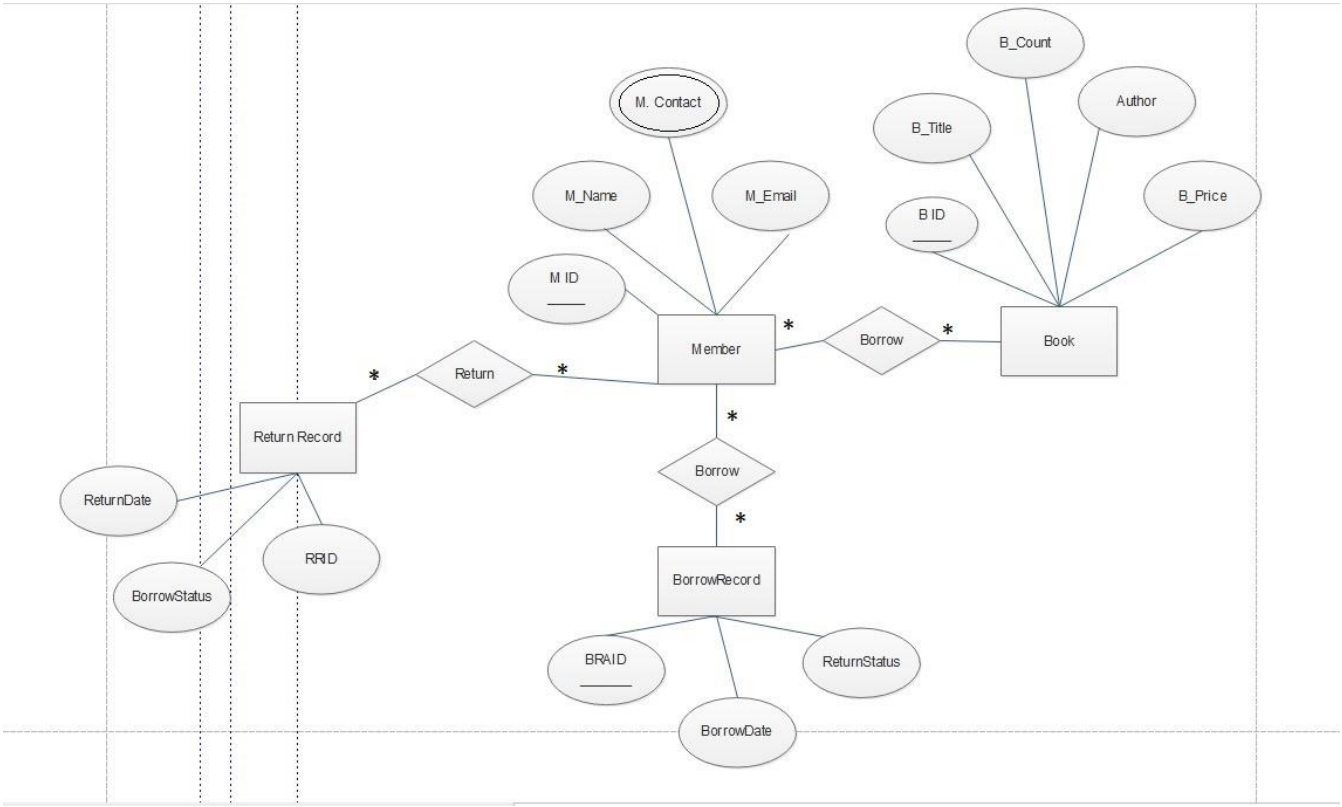
The project is about library management system. There are total 4 entity in the library management system. They are, 1)Member 2)Book 3)BorrowRecord 4)ReturnRecord.

In a library every member has different value again book has b_id,price ,author etc .In this management process there are borrow and return process also.

This library management process is very efficient for business environment cause it will be very helpful when we use it in the library system. We easily find single data from this system and again all library organization use our database system. So it very beneficial for the business environment.

4)

ER Diagram



5)

Normalization

🟦 → **Primary key**
🟥 → **Foreign key**

Borrow →

1NF – M_Contact is a multivalued attribute

2NF – M_ID, M_Name, M_Contact, M_Email, B_ID, B_Title, B_Count, Author, B_Price

3NF – No transitive dependency

M_ID, M_Name, M_Email

M_ID, M_Contact (Composite PK)

B_ID, B_Title, B_Count, Author, B_Price

MB_ID, M_ID, B_ID

Borrow →

1NF – M_Contact is a multivalued attribute

2NF – M_ID, M_Name, M_Contact, M_Email, BRID, BorrowDate, ReturnStatus

3NF – No transitive dependency

M_ID, M_Name, M_Email

M_ID, M_Contact (Composite PK)

BRID, BorrowDate, ReturnStatus

MBR_ID, M_ID, BRID

Return →

1NF – M_Contact is a multivalued attribute

2NF – M_ID, M_Name, M_Contact, M_Email, RRID, ReturnDate, BorrowStatus

3NF – No transitive dependency

M_ID, M_Name, M_Email

M_ID, M_Contact

RRID, ReturnDate, BorrowStatus

MRR_ID, M_ID, RRID

Final Tables →

M_ID, M_Name, M_Email → **Member**

M_ID, M_Contact (Composite PK) → **M_Identity**

MB_ID, M_ID, B_ID → **BM_Relation**

BRID, BorrowDate, ReturnStatus → **B_Record**

MBR_ID, M_ID, BRID → **M_Borrow**

B_ID, B_Title, B_Count, Author, B_Price, S_Key → **Book**

RRID, ReturnDate, BorrowStatus → **R_Record**

MRR_ID, M_ID, RRID → **M_Return**

6) Description of each table:

Member Table Query -->

Column	Null?	Type
M_ID	-	NUMBER(6,0)
M_NAME	-	VARCHAR2(25)
M_EMAIL	-	VARCHAR2(30)

```
create table member(
m_id number(6),
m_name varchar2(25),
m_email varchar2(30)
)
```

describe member

M_Identity Table Query -->

Column	Null?	Type
M_ID	-	NUMBER(6,0)
M_CONTACT	-	NUMBER(15,0)

create table m_identity(

m_id number(6),

m_contact number(15)

)

describe m_identity

BM_Relation Table Query -->

Column	Null?	Type
MB_ID	-	NUMBER(8,0)
M_ID	-	NUMBER(6,0)
B_ID	-	NUMBER(6,0)

create table bm_relation(

mb_id number(8),

m_id number(6),

b_id number(6)

)

describe bm_relation

B_Record Table Query -->

Column	Null?	Type
BRID	-	NUMBER(8,0)
BORROWDATE	-	DATE
RETURNSTATUS	-	VARCHAR2(30)

```
create table b_record(
brid number(8),
borrowdate date,
returnstatus varchar2(30)
)
describe b_record
```

M_Borrow Table Query -->

Column	Null?	Type
MBR_ID	-	NUMBER(10,0)
M_ID	-	NUMBER(6,0)
BRID	-	NUMBER(8,0)

```
create table m_borrow(
mbr_id number(10),
m_id number(6),
brid number(8)
)
describe m_borrow
```

Book Table Query -->

Column	Null?	Type
B_ID	-	NUMBER(6,0)
B_TITLE	-	VARCHAR2(20)
B_COUNT	-	NUMBER(8,0)
AUTHOR	-	VARCHAR2(25)
B_PRICE	-	NUMBER(6,0)

```
create table book(
b_id number(6),
b_title varchar2(20),
b_count number(8),
author varchar2(25),
b_price number(6)
)
describe book
```

R_Record Table Query -->

Column	Null?	Type
RRID	-	NUMBER(8,0)
RETURNDATE	-	DATE
BORROWSTATUS	-	VARCHAR2(30)

```
create table r_record(
rrid number(8),
returndate date,
borrowstatus varchar2(30)
)
```

describe r_record

M_Return Table Query -->

Column	Null?	Type
MRR_ID	-	NUMBER(10,0)
M_ID	-	NUMBER(6,0)
RRID	-	NUMBER(8,0)

create table m_return(

mrr_id number(10),

m_id number(6),

rrid number(8)

)

describe m_return

7)

Final Table with Insertion Values Query

Member Table:

Insert into member values(201,RAFID,'rafid@gmail.com')

Insert into member values(202,'KORIM','korim@gmail.com')

Insert into member values(203,'TAWHID','tawhid@gmail.com')

Insert into member values(204,'PROSENJIT','prosenjit@gmail.com')

Insert into member values(205,'RAHUL','rahul@gmail.com')

select * from member

M_ID	M_NAME	M_EMAIL
201	Rafid	rafid@gmail.com
202	KORIM	korim@gmail.com
203	TAWHID	tawhid@gmail.com
204	PROSENJIT	prosenjit@gmail.com
205	RAHUL	rahul@gmail.com

M_Identity Table:

Insert into m_identity values(201,01745698745)

Insert into m_identity values(202,01741257896)

Insert into m_identity values(203,01721036547)

Insert into m_identity values(204,01720145789)

Insert into m_identity values(205,01732014569)

select * from m_identity

M_ID	M_CONTACT
201	1745698745
204	1720145789
205	1732014569
202	1741257896
203	1721036547

BM_Relation Table:

Insert into bm_relation values(101,201,102)

Insert into bm_relation values(102,202,102)

Insert into bm_relation values(103,203,104)

Insert into bm_relation values(104,204,102)

Insert into bm_relation values(105,205,102)

select * from bm_relation

MB_ID	M_ID	B_ID
105	205	102
103	203	104
104	204	102
102	202	102
101	201	102

Book Table:

describe book

create sequence book_seq

start with 101

increment by 1

maxvalue 1000

nocycle

insert into book values(book_seq.nextval, 'Loss' ,8, 'William' ,300)

insert into book values(book_seq.nextval, 'Drakness',10, 'Robert' , 350)

insert into book values(book_seq.nextval, 'Afraid' ,12, 'Pattinson' ,500)

insert into book values(book_seq.nextval, 'One hundred years' ,14, 'Marquez' ,340)

insert into book values(book_seq.nextval, 'Love and Peace' ,16, 'Alex' ,240)

select * from book

B_ID	B_TITLE	B_COUNT	AUTHOR	B_PRICE
104	One hundred years	14	Marquez	340
101	Loss	8	William	300
102	Drakness	10	Robert	350
103	Afraid	12	Pattinson	500
105	Love and Peace	16	Alex	240

B_Record Table:

Insert into b_record values(401,'09-JAN-2001',NULL)

Insert into b_record values(402,'21-MAR-2002',NULL)

Insert into b_record values(403,'15-SEP-2003',NULL)

Insert into b_record values(404,'24-DEC-2003',NULL)

Insert into b_record values(405,'23-FEB-2004',NULL)

select * from b_record

BRID	BORROWDATE	RETURNSTATUS
402	21-MAR-02	-
403	15-SEP-03	-
404	24-DEC-03	-
401	09-JAN-01	-
405	23-FEB-04	-

M_Borrow:

Insert into m_borrow values(101,202,401)

Insert into m_borrow values(102,201,402)

Insert into m_borrow values(103,204,403)

Insert into m_borrow values(104,203,404)

Insert into m_borrow values(105,205,405)

select * from m_borrow

MBR_ID	M_ID	BRID
101	202	401
102	201	402
103	204	403
104	203	404
105	205	405

R_Record:

Insert into r_record values(101,'01-MAR-2009',NULL)

Insert into r_record values(102,'02-MAY-2011',NULL)

Insert into r_record values(103,'20-JUN-2013',NULL)

Insert into r_record values(104,'20-JUL-2011',NULL)

Insert into r_record values(105,'21-JUL-2014',NULL)

select * from r_record

RRID	RETURNDATE	BORROWSTATUS
101	01-MAR-09	-
102	02-MAY-11	-
104	20-JUL-11	-
105	21-JUL-14	-
103	20-JUN-13	-

M_Return Table:

Insert into m_return values(111,201,102)

Insert into m_return values(222,202,103)

Insert into m_return values(333,203,104)

Insert into m_return values(444,204,105)

Insert into m_return values(555,205,101)

select * from m_return

MRR_ID	M_ID	RRID
333	203	104
444	204	105
111	201	102
222	202	103
555	205	101

8)

10 Query Question and Solution

#1 Display the book info with maximum price

select *

from book

where b_price=(select max(b_price)

from book)

B_ID	B_TITLE	B_COUNT	AUTHOR	B_PRICE
3	Afraid	12	Pattinson	500

#2 Display the member info who borrowed the book "Loss"

select member.m_id,m_name,m_email

from member,book,bm_relation

where member.m_id=bm_relation.m_id and book.b_id=bm_relation.b_id and book.b_title='Loss'

#3 Display the borrow history of the year 2001

select *

from b_record,bm_relation,m_borrow

where b_record.brid=m_borrow.brid and m_borrow.m_id=bm_relation.m_id and borrowdate between '01-JAN-01' and '31-DEC-01'

BRID	BORROWDATE	RETURNSTATUS	MB_ID	M_ID	B_ID	MBR_ID	M_ID	BRID
401	09-JAN-01	-	102	202	102	101	202	401

#4 Display the amount of phone numbers a member have

select m_id, count(m_contact)

from m_identity

group by m_id

order by count(m_contact)

M_ID	COUNT(M_CONTACT)
203	1
204	1
205	1
201	1
202	1

#5 Display the book name, author name who has the letter ‘o’ in their name

select b_title,author

from book

where author like '%o%'

B_TITLE	AUTHOR
Drakness	Robert
Afraid	Pattinson

#6 Display the book title which has more copies than the book 'Darkness'

```
select b_title
from book
where b_count > (select b_count
from book
where b_title='Darkness')
```

#7 Display the return record of the member 'Rahul'

```
select r_record.rrid, returndate, borrowstatus
from r_record,m_return
where r_record.rrid=m_return.rrid and m_return.m_id=(select m_id
from member where m_name='RAHUL')
```

RRID	RETURNDATE	BORROWSTATUS
101	01-MAR-09	-

#8 Display average book price and minimum book price

```
select avg(B_Price),min(B_price) from book
```

AVG(B_PRICE)	MIN(B_PRICE)
346	240

#9 Display the book name, Author name whose name start from ‘R’

```
select b_id,author from book where author like 'R%'
```

B_ID	AUTHOR
2	Robert

#10 Display the member info whose M_id is 201

select * from member where m_id=201

M_ID	M_NAME	M_EMAIL
201	Rafid	rafid@gmail.com

Part B

There are several advantages of database management systems. Chief among them are data redundancy and consistency, data sharing, integrity restrictions, and greater security. We have learnt about how to arrange various Data & how to manipulate them in a convenient way. We can make our career, based on database. This could be so much effective to some of us in the course “advanced database management”. We had a great experience during this course. We have built our own database management system named – “Library management system”. This project can help many of the library to manage their system and this could also be effectively helpful for everyone to have a hassle free experience. We have some future plans to do with this project.