INTRODUCTION TO DATABASE

PROJECT

SECTION : I

TOPIC : UNIVERSITY MANAGEMENT SYSTEM

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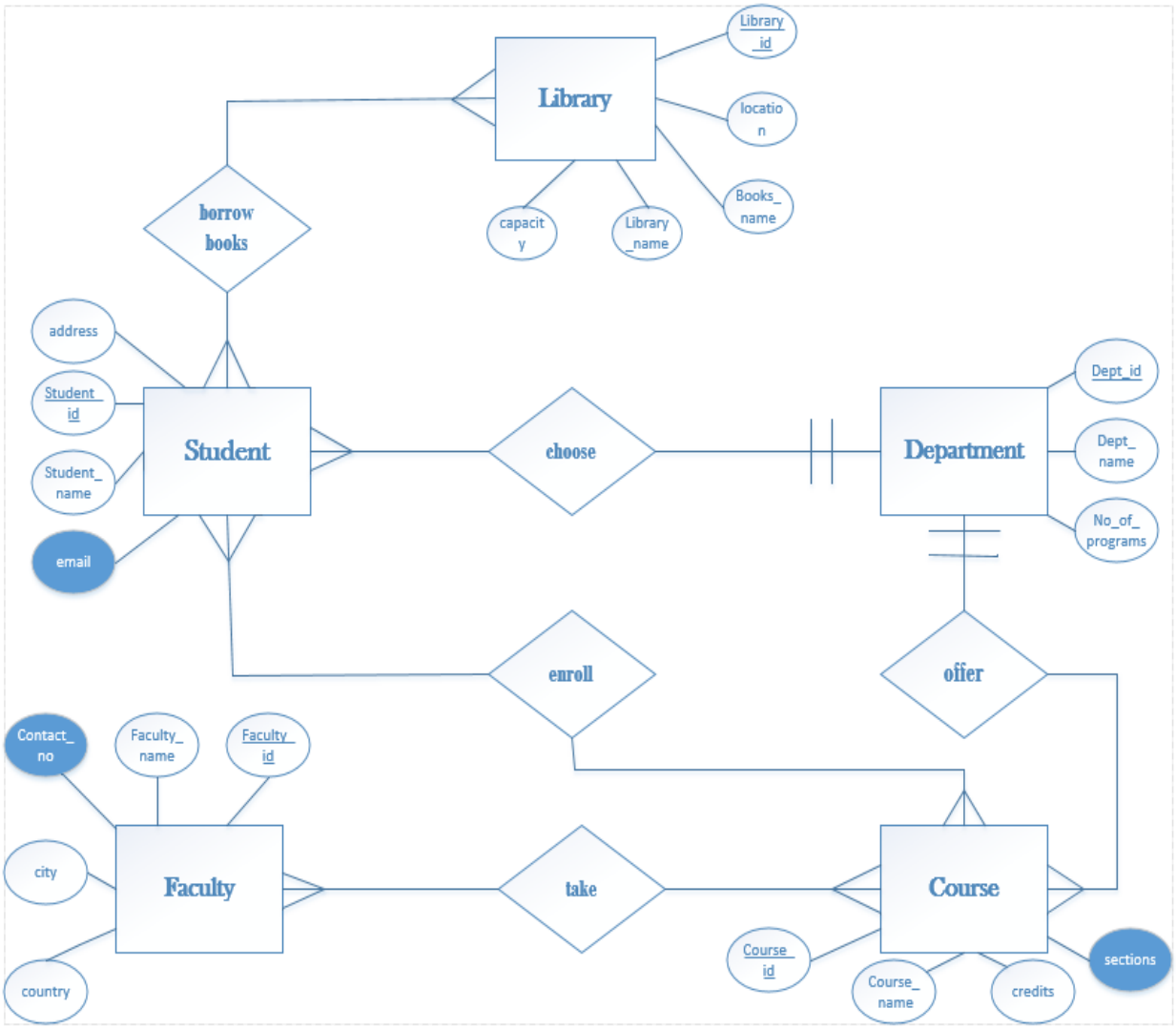
UNIVERSITY MANAGEMENT SYSTEM

University Management System is the process of several manages. It used structured data and to define the relationships between structured data groups of University Management System. Here are the requirements of a university management system :

- Students are identified by an s_id, sname,email,address.
- Student can choose only one depertment in a University.
- Departments are identified by an d_id,dname,no_of _program.
- Department offered different types of course.
- Courses are identified by an c_id,cname,credits,section.
- Faculties are identefied by their f_id,fname,contact_no,city,country.
- Faculty can take different types of course.
- Student enroll different types of course.
- Library has l_id,lname,books_name,location,capacity.
- Student can borrow book from library.

ER-DIAGRAM


Library
Library_id
location
Books_name
capacity
Library_name
borrow books
address
Student_id
Student_name
email
Student
choose
Department
Dept_id
Dept_name
No_of_programs
enroll
offer
Contact_no
Faculty_name
Faculty_id
city
country
Faculty
take
Course
Course_id
Course_name
credits
sections

NORMALIZATION

Step 1 :

Borrow book : (s_id,sname,email,address,l_id,lname,
Books_name,location,capacity)

1NF : email is a multivalued attribute

2NF : s_id,sname,email,address
l_id,lname,books_name,location,capacity

3NF : No transitive dependency

TABLE FOR borrow book:

1. s_id,sname ,address,
2. S_id,email ⇨ composite pk
3. l_id,lname,location,books_name,capacity
4. n_id , l_id , S_id

Step 2:

Choose : (s_id,sname,email,,address,d_id,dname,no_of_program)

1NF : email is a multivalued attribute

2NF : s_id,sname,email ,address
d_id,dname,no_of_program

3NF : No transitive dependency

TABLE FOR choose :

1. s_id,sname ,address,
2. S_id,email ⇨ composite pk (d_id)
3. d_id,dname,no_of_program

Step 3 :

Offer : (d_id,dname,no_of_program,c_id,cname,section,credits)

1NF : section is a multivalued attribute

2NF : d_id,dname,no_of_program

c_id,cname,section,credits

3NF : No transitive dependency

TABLE FOR offer:

1. d_id,dname,no_of_program
2. c_id,cname,credits,
3. C_id,section ⇨ composite pk (d_id)

step 4:

enroll: (s_id,sname,email,,address, c_id,cname,section,credits)

1NF : email & section are multivalued attributes

2NF : s_id,sname,email,,address

c_id,cname,section,credits

3NF : No transitive dependency.

TABLE FOR enroll :

1) s_id,sname,address
2) S_id,email ⇨ composite pk
3) c_id,cname,credits
4) c_id,section ⇨ composite pk
5) n1_id, (S_id) , (C_id)

Step 5

take : (f_id,fname,contact_no,city,country,c_id,cname,section,credits)

1NF: contact_no & section are multivalued attributes.

2NF: f_id,fname,contact_no,city,country

c_id,cname,section,credits

3NF: f_id,fname,contact_no

pass_no,city,country

c_id,cname,section,credits

TABLES FOR take:

1. f_id,fname, (pass_no)
2. f_id,contact_no ⇨ composite pk
3. pass_no,city,country
4. c_id,cname,credits
5. c_id,section ⇨ composite pk
6. n2_id, (f_id) , (c_id)

TOTAL TABLES

~~1) s_id,sname ,address~~
~~2) s_id,email~~
3) l_id,lname,location,books_name,capacity
4) n_id , l_id , s_id
5) s_id,sname ,address,d_id
6) s_id,email
7) d_id,dname,no_of_program
~~8) d_id,dname,no_of_program~~
9) c_id,cname,credits, d_id
10) c_id,section
~~11) s_id,sname,address~~
~~12) s_id,email~~
~~13) c_id,cname,credit~~
~~14) c_id,section~~
15) n1_id,s_id,c_id
16) f_id,fname,pass_no
17) f_id,contact_no
18)pass_no,city,country
~~19) c_id,cname,credits~~
~~20) c_id,section~~
21) n2_id,f_id,c_id

FINAL TABLES

Table No	Table Name	Column name
1	**Library**	li_id,lname,location,books_name , capacity
2	**Information**	n_id , l_id , s_id
3	**Student**	s_id,sname ,address,d_id
4	**Student_Information**	s_id,email
5	**Department**	d_id,dname,no_of_program
6	**Course**	c_id,cname,credits, d_id
7	**Course_Information**	c_id,section
8	**Information1**	n1_id,s_id,c_id
9	**Faculty**	f_id,fname,pass_no
10	**Faculty_Contact**	f_id,contact_no
11	**Faculty_Information**	pass_no,city,country
12	**Information2**	n2_id,f_id,c_id

TABLE CREATION

DESCRIPTIONS

Library:

```
desc library
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **LIBRARY**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
LIBRARY	LIBRARY_ID	Number	-	20	0	1	-	-	-
	LIBRARY_NAME	Varchar2	100	-	-	-	-	-	-
	BOOKS_NAME	Varchar2	50	-	-	-	✓	-	-
	LOCATION	Varchar2	20	-	-	-	-	-	-
	CAPACITY	Number	-	10	0	-	✓	-	-

1 - 5

Department:

```
desc Department
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **DEPARTMENT**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPARTMENT	DEPARTMENT_ID	Number	-	20	0	1	-	-	-
	DEPARTMENT_NAME	Varchar2	20	-	-	-	-	-	-
	NO_OF_PROGRAM	Number	-	10	0	-	✓	-	-

1 - 3

Student

```
desc Student
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **STUDENT**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
STUDENT	STUDENT_ID	Number	-	-	0	1	-	-	-
	FIRST_NAME	Varchar2	25	-	-	-	-	-	-
	LAST_NAME	Varchar2	25	-	-	-	-	-	-
	ADDRESS	Varchar2	30	-	-	-	✓	-	-
	DEPARTMENT_ID	Number	-	-	0	-	✓	-	-

1 - 5

Course:

```
desc Course
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **COURSE**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
COURSE	COURSE_ID	Number	-	-	0	1	-	-	-
	COURSE_NAME	Varchar2	25	-	-	-	-	-	-
	DEPARTMENT_ID	Number	-	-	0	-	✓	-	-

1 - 3

Faculty:

```
desc Faculty
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **FACULTY**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
FACULTY	FACULTY_ID	Number	-	20	0	1	-	-	-
	FACULTY_NAME	Varchar2	100	-	-	-	-	-	-
	PASSPORT_NO	Varchar2	20	-	-	-	✓	-	-

1 - 3

Faculty_contract:

```
desc Faculty_contract
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **FACULTY_CONTRACT**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
FACULTY_CONTRACT	FACULTY_ID	Number	-	20	0	1	-	-	-
	CONTRACT_NO	Varchar2	100	-	-	-	-	-	-

1 - 2

Faculty_information:

```
desc Faculty_information
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **FACULTY_INFORMATION**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
FACULTY_INFORMATION	PASSPORT_NO	Varchar2	50	-	-	1	-	-	-
	CITY	Varchar2	100	-	-	-	-	-	-
	COUNTRY	Varchar2	50	-	-	-	✓	-	-

1 - 3

Information:

```
desc information
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **INFORMATION**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
INFORMATION	NEW_ID	Number	-	-	0	1	-	-	-
	LIBRARY_ID	Number	-	-	0	-	✓	-	-
	STUDENT_ID	Number	-	-	0	-	✓	-	-

1 - 3

Student_information:

```
desc student_information
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **STUDENT_INFORMATION**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
STUDENT_INFORMATION	STUDENT_ID	Number	-	20	0	1	-	-	-
	EMAIL_NO	Varchar2	100	-	-	-	✓	-	-

1 - 2

Course_information:

```
desc course_information
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **COURSE_INFORMATION**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
COURSE_INFORMATION	COURSE_ID	Number	-	20	0	1	-	-	-
	SECTION	Varchar2	100	-	-	-	✓	-	-

1 - 2

Information_1:

```
desc information_1
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **INFORMATION_1**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
INFORMATION_1	NEW_ID_1	Number	-	-	0	1	-	-	-
	STUDENT_ID	Number	-	-	0	-	✓	-	-
	COURSE_ID	Number	-	-	0	-	✓	-	-

1 - 3

Information_2:

```
desc information_2
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **INFORMATION_2**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
INFORMATION_2	NEW_ID_2	Number	-	-	0	1	-	-	-
	FACULTY_ID	Number	-	-	0	-	✓	-	-
	COURSE_ID	Number	-	-	0	-	✓	-	-

1 - 3

TABLE INFORMATION

Library:

```
select*
from library
```

Results Explain Describe Saved SQL History

LIBRARY_ID	LIBRARY_NAME	BOOKS_NAME	LOCATION	CAPACITY
1021	Bongobondhu	Tantra_illuminater	Iblish_chottor	1000
1023	Saya_nazrul	When_to_jump	Modhur_canteen	3000
1024	M_mounsur_ali	After_the_prophet	Hakim_chottor	2500
1025	M_Kamruzzaman	The_decision_book	Paris_road	1500
1022	Ta_juddin	Ted_talks	Central_library	2000

Department:

```
select*
from department
```

Results Explain Describe Saved SQL History

DEPARTMENT_ID	DEPARTMENT_NAME	NO_OF_PROGRAM
2003	BBA	128
2004	ECONOMICS	130
2001	CSE	148
2002	EEE	145
2005	ENGLISH	125

Student:

```
select *
from student
```

Results Explain Describe Saved SQL History

STUDENT_ID	FIRST_NAME	LAST_NAME	ADDRESS	DEPARTMENT_ID
1111	Nusrat	Jahan	Rampura	2001
1113	Zamil	Ahmed	Khilkhet	2003
1114	Ehsan	Talukder	Uttara	2004
1112	Emrul	Hasan	Mirpur	2002
1115	Ritu	Basak	Bashundhara	2005

Course:

```
select *
from course
```

Results Explain Describe Saved SQL History

COURSE_ID	COURSE_NAME	DEPARTMENT_ID
50005	Programming Language	2003
50007	English 1	2004
50001	Data structure	2001
50003	Electrical circuit 1	2002
50009	java	2005

Faculty:

```
select *
from faculty
```

Results Explain Describe Saved SQL History

FACULTY_ID	FACULTY_NAME	PASSPORT_NO
6002	FARHAT TASANNUM FARAH	dd--37763672
6005	NADIA NOWSHIN	yy--8382726378
6001	RIFAT TASNIM ANANNYA	ka--19902376
6003	PROF. DR. KHONDAKER ABDUL MALEQUE	aa--672827822
6004	DR. A.K. MONAW-WAR UDDIN AHMAD	he--872876328

Faculty_contract:

```
select *
from faculty_contract
```

Results Explain Describe Saved SQl

FACULTY_ID	CONTRACT_NO
6002	farah@aiub.edu
6004	akmwuahmad@aiub.edu
6001	rifat.tasnim@aiub.edu
6003	maleque@aiub.edu
6005	nowshin@aiub.edu

Faculty_information:

```
select *
from faculty_information
```

Results Explain Describe Saved SQL History

PASSPORT_NO	CITY	COUNTRY
dd--37763672	CHOTTOGRAM	BANGLADESH
he--872876328	RANGPUR	BANGLADESH
yy--8382726378	SYDNEY	AUSTRALIA
ka--19902376	DHAKA	BANGLADESH
aa--672827822	SYLHET	BANGLADESH

Information:

```
select *
from information
```

Results Explain Describe Saved SQL Hi

NEW_ID	LIBRARY_ID	STUDENT_ID
4	1024	1114
1	1021	1111
2	1022	1112
3	1023	1113
5	1025	1115

Student_information:

```
select *
from student_information
```

Results Explain Describe Saved SQL H

STUDENT_ID	EMAIL_NO
1112	imrulhasan003@.com
1115	ritubasak009@gmail.com
1111	nusratjahan009@gmail.com
1113	zamilahmed990@gmail.com
1114	eshantalukder00@gmail.com

Course_information:

```
Select *
from  course_information
```

Results Explain Describe S

COURSE_ID	SECTION
50001	DD9091-A
50007	DD9094-D
50003	DD9092-B
50005	DD9093-C
50009	DD9095-E

Information_1:

```
select *
from information_1
```

Results Explain Describe Saved SQL Hist

NEW_ID_1	STUDENT_ID	COURSE_ID
9091	1111	50001
9093	1113	50005
9092	1112	50003
9094	1114	50007
9095	1115	50009

Information_2:

```
select *
from information_2
```

Results Explain Describe Saved SQL His

NEW_ID_2	FACULTY_ID	COURSE_ID
10003	6003	50005
10004	6004	50007
10001	6001	50001
10002	6002	50003
10005	6005	50009

CONSTRAINT DISABLE / ENABLE

For department table:

Disable constraint not null:

```
alter table Department
disable constraint Department_name_nn

desc department
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **DEPARTMENT**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPARTMENT	DEPARTMENT_ID	Number	-	20	0	1	-	-	-
	DEPARTMENT_NAME	Varchar2	20	-	-	-	✓	-	-
	NO_OF_PROGRAM	Number	-	10	0	-	✓	-	-

1 - 3

Enable constraint not null:

```
alter table Department
enable constraint Department_name_nn

desc department
```

Results Explain Describe Saved SQL History

Object Type **TABLE** Object **DEPARTMENT**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
DEPARTMENT	DEPARTMENT_ID	Number	-	20	0	1	-	-	-
	DEPARTMENT_NAME	Varchar2	20	-	-	-	-	-	-
	NO_OF_PROGRAM	Number	-	10	0	-	✓	-	-

1 - 3

Insert value:

```
select*
from department
```

Results Explain Describe Saved SQL History

DEPARTMENT_ID	DEPARTMENT_NAME	NO_OF_PROGRAM
2003	BBA	128
2004	ECONOMICS	130
2001	CSE	148
2002	EEE	145
2005	ENGLISH	125
2021	MATH	126

6 rows returned in 0.00 seconds CSV Export

For faculty table:

Disable constraint not null:

```
alter table faculty
disable constraint faculty_name_ww

desc Faculty
```

Results Explain **Describe** Saved SQL History

Object Type **TABLE** Object **FACULTY**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
FACULTY	FACULTY_ID	Number	-	20	0	1	-	-	-
	FACULTY_NAME	Varchar2	100	-	-	-	✓	-	-
	PASSPORT_NO	Varchar2	20	-	-	-	✓	-	-

1 - 3

Enable constraint not null:

```
alter table faculty
enable constraint faculty_name_ww

desc Faculty
```

Results Explain **Describe** Saved SQL History

Object Type **TABLE** Object **FACULTY**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
FACULTY	FACULTY_ID	Number	-	20	0	1	-	-	-
	FACULTY_NAME	Varchar2	100	-	-	-	-	-	-
	PASSPORT_NO	Varchar2	20	-	-	-	✓	-	-

1 - 3

Insert value:

```
select *
from faculty
```

Results Explain Describe Saved SQL History

FACULTY_ID	FACULTY_NAME	PASSPORT_NO
6002	FARHAT TASANNUM FARAH	dd--37763672
6005	NADIA NOWSHIN	yy--8382726378
6021	ZARIN KHAN	yd--83827987378
6001	RIFAT TASNIM ANANNYA	ka--19902376
6003	PROF. DR. KHONDAKER ABDUL MALEQUE	aa--672827822
6004	DR. A.K. MONAW-WAR UDDIN AHMAD	he--872876328

6 rows returned in 0.00 seconds CSV Export

SEQUENCES

Library Table:

create sequence library_seq

increment by 1

start with 1021

maxvalue 100000

```
select Library_id
from library sequence
```

Results Explain Describ

LIBRARY_ID
1021
1022
1023
1024
1025

Course Information Table:

create sequence course_information_seq

increment by 2

start with 50001

maxvalue 100000

```
select Course_id
from course_information sequence
```

Results Explain Describe Saved SQL

COURSE_ID
50001
50003
50005
50007
50009

VIEW

Faculty Table:

```
create or replace view FACULTY_1
as select Faculty_id "F_ID",Faculty_name "F_NAME",Passport_no "PASS_NO"
from faculty

Select *
from FACULTY_1
```

Results Explain Describe Saved SQL History

F_ID	F_NAME	PASS_NO
6002	FARHAT TASANNUM FARAH	dd--37763672
6005	NADIA NOWSHIN	yy--8382726378
6021	ZARIN KHAN	yd--83827987378
6001	RIFAT TASNIM ANANNYA	ka--19902376
6003	PROF. DR. KHONDAKER ABDUL MALEQUE	aa--672827822
6004	DR. A.K. MONAW-WAR UDDIN AHMAD	he--872876328

Course Table:

```
create or replace view COURSE_1
as select course_id "C_NO",Course_name "C_NAME'
from course

Select *
from COURSE_1
```

Results Explain Describe Saved SQL History

C_NO	C_NAME
50005	Programming Language
50007	English 1
50001	Data structure
50003	Electrical circuit 1
50009	java

QUERY QUESTIONS

1.Display department name where student id is 1112.

2.Find out in which library Ted Talks book is available and select the location of that library.

3.Find out the faculty_id and passport _no of faculty whose name starts with R and ends with A.

4.Find out the passport no and contract no of Rifat Tasnim Anannya.

5.Find the city and Country of a faculty with faculty_id-6001.

6.find out the library where zamil is allow.

7.Find out the Email_no of Zamil or Ehsan.

8.Find out the section of java course.

9.Find out all info of student course id with 5001.

10.Find out the faculty id of java course.

RELATIONAL ALGEBRA

1.Display department name where student id of a student is 1112.

Answer: $\pi_{department\_name}[\sigma_{student\_id=1112}$ **and** $\sigma_{student.department\_id=department.department\_id}^{(department\ x\ student)}]$

2.Find out in which library ted_talk book is available and select the location of this library.

Answer: $\pi_{library\_name,location}[\sigma_{book\_name=''ted\_talk''}^{(library)}]$

3.Find out the passport number and contact no of the faculty.

Answer: $\pi_{passport\_no}^{(faculty)} \cap \pi_{contact\_no}^{(faculty\_contact)}$

4.Find out all information of student course id with 5001.

Answer: $^{\sigma}\sigma_{course\_id=5001}$ **and (student x information1)**

$\sigma_{information1.student\_id=student.student\_id}$

5.Find out the faculty id of Java course.

Answer: $\pi_{faculty\_id}[\sigma_{course\_name=''JAVA''}$ **and** $\sigma_{information2.course\_id=course.course\_id}^{(information\ x\ course)}]$

This project helped us to understand how can we store many data and never loose them . We faced problem when we were normalizing this data .Normalization is very sensitive. We have learnt how SQL works and the program thinks. Now future plan is to observe our surrounding more carefully and try to make a database based on that.