Institute of Engineering

Pulchowk Campus

B.E. Sixth Semester

2077 Batch

Lab Report

on

Database Management System (DBMS)

Submitted by

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Lab 1

Basic Introduction to SQL

In this section students are supposed to write basic theory, commands and their syntax.

You are suggested to independently write this section.

Refer to the resources uploaded to the drive folder. All your theories must be based on MYSQL.

Lab 2

Installation of MySQL Community Edition on Windows

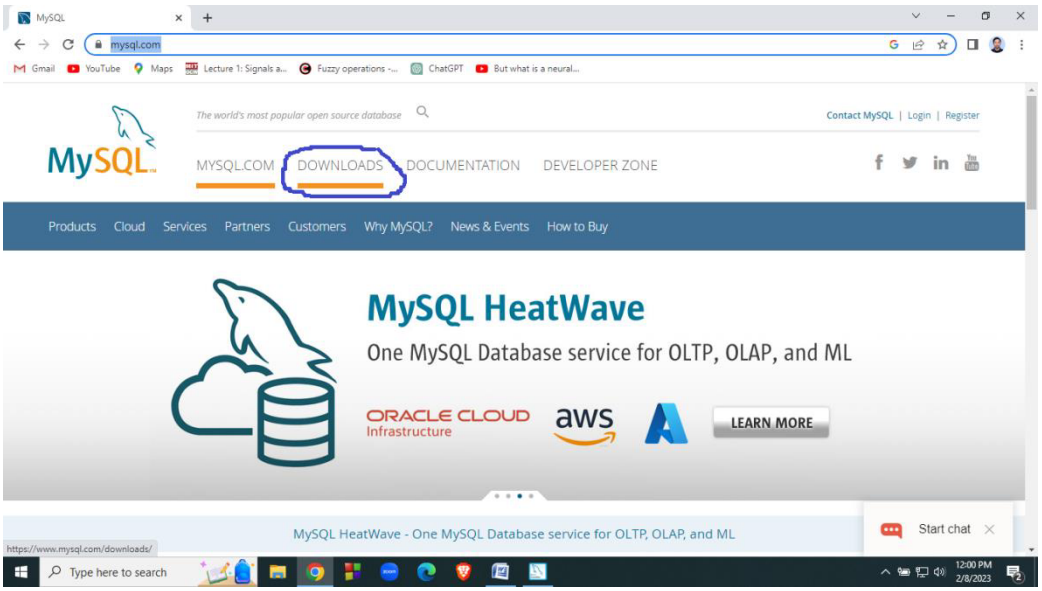
In this lab, students are expected to learn the process of installing MySQL Installer and configuring MySQL server for running DBMS queries in MySQL Workbench.

Following are the steps to be followed:

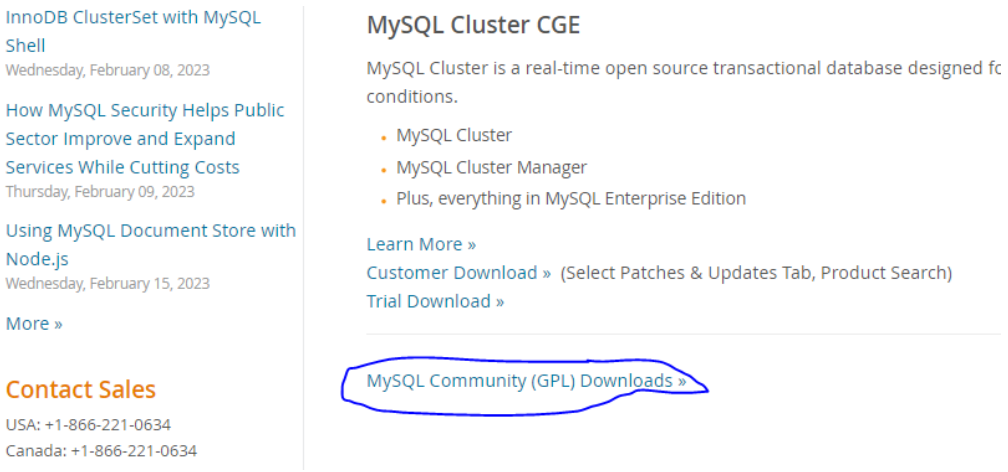
Steps for downloading MySQL Community Edition:

Step 1. Go to https://www.mysql.com/

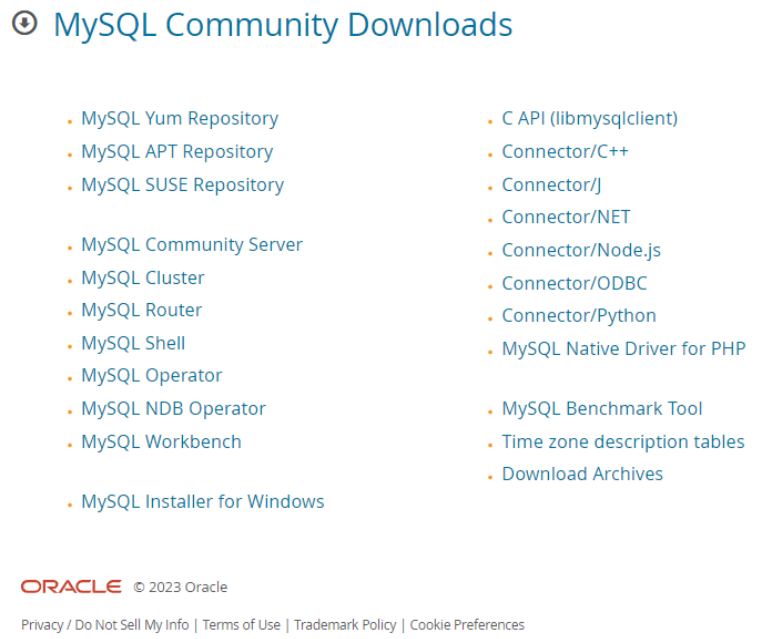
Step 2. Click on Downloads



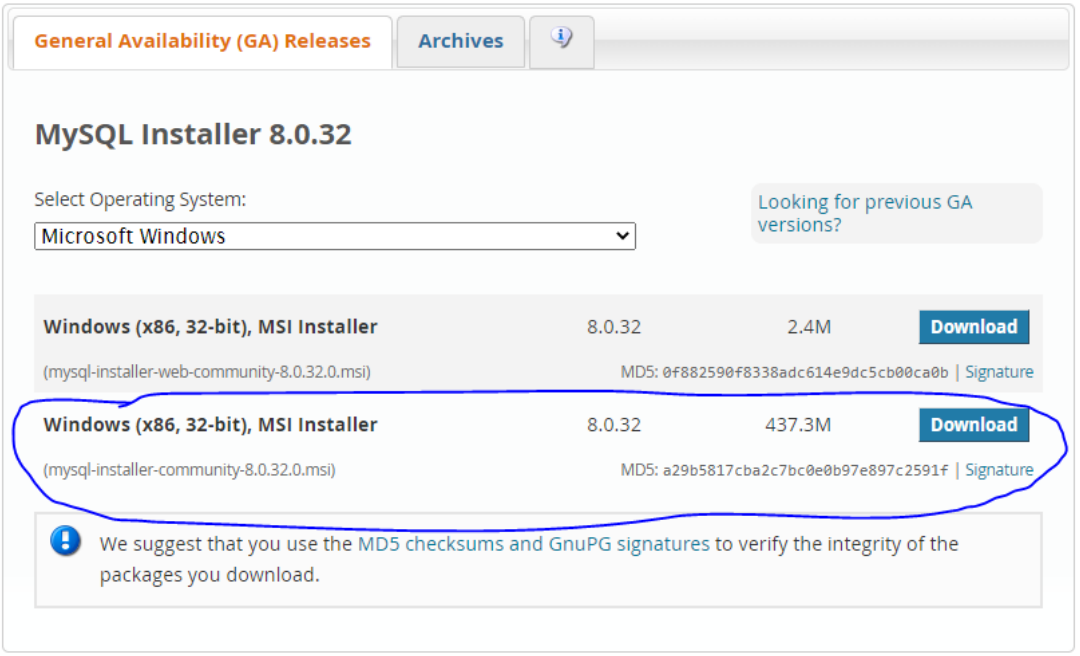
Step 3. After clicking on Downloads, scroll the webpage and locate the link for MySQL Community(GPL) Downloads



Step 4. Upon click on the aforementioned link, following list of downloads will be shown:

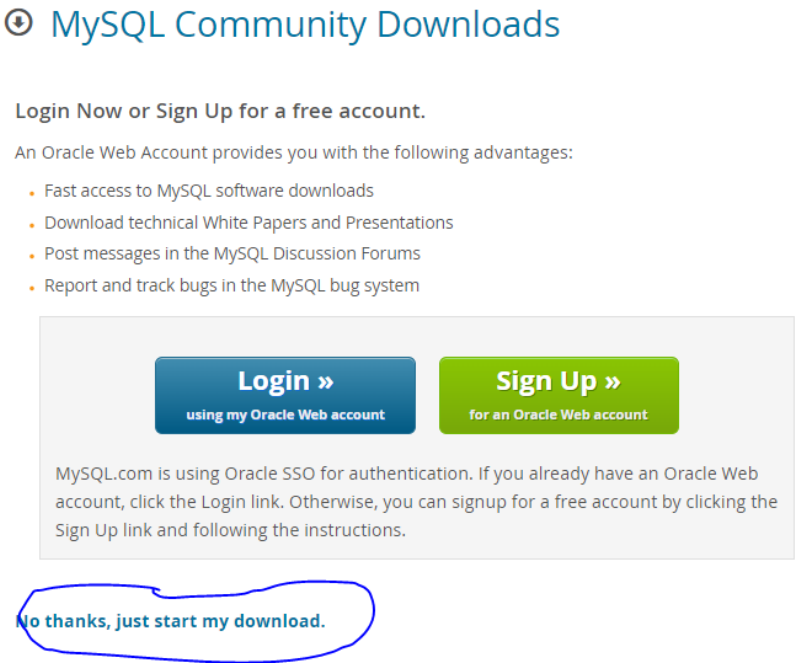


Step 5. Click on MySQL Installer for Windows. Following download links will be displayed:

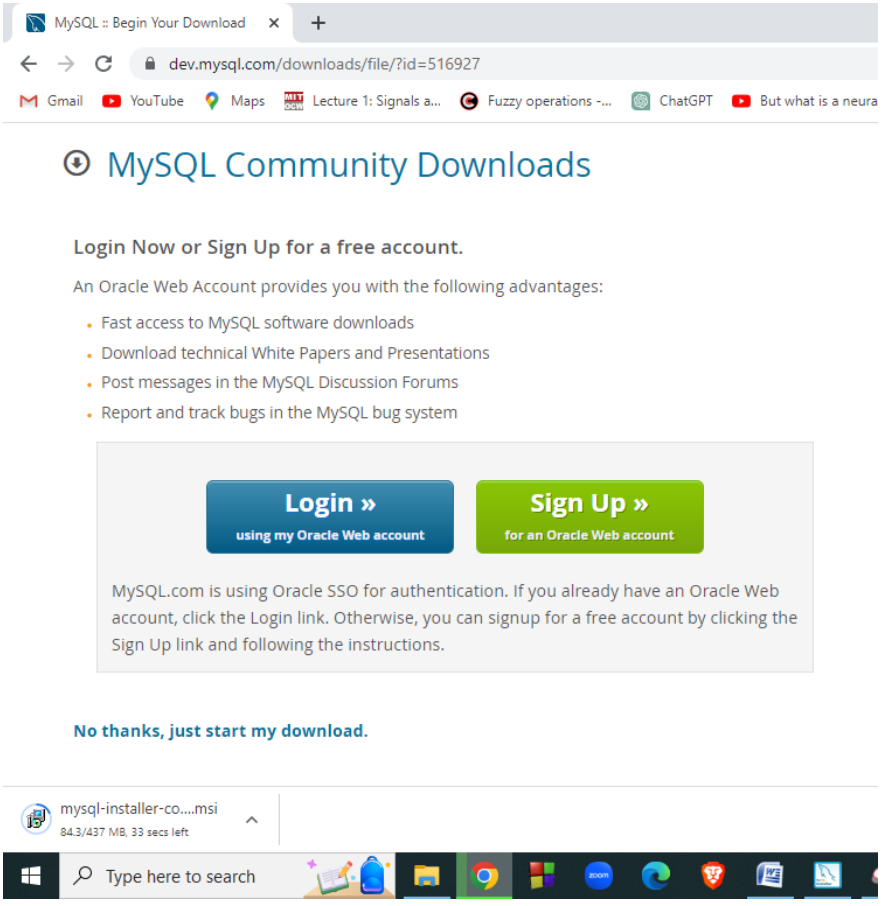


Step 6. Click on Windows(x86, 32bit), MSI Installer for offline installation.

Step 7. Before starting download, the web page suggests you to login or signup for oracle web account. If you like, you can open one. However, if you want to download directly, click on **No thanks, just start my download** as shown in the following image.



Step 8. Now, the browser will start the download of installer file.



This completes the download procedure.

Step 9. Double click on the downloaded MSI installer file for MySQL community edition.

Complete remaining steps yourself!

Lab 3

SQL Queries Set 1

In this lab, students are expected to learn basic MySQL queries to create a database, use existing database, create tables with a set of attributes, insert values, set constraints on attributes etc.

Q_1: Perform the following taks:

Task #1: Create a database called **`DBMS_BCT`**

Task #2: Use the database **`DBMS_BCTS`**

Task #3: Create a table **student** with following schema

`student(name, roll, marks, address)`

Task #4: Populate the table with following data

name	***roll***	***marks***	***address***
Ram	12	98	KTM
Shyam	13	99	PKR
Hari	14	95	BKT
Rita	15	85	TNU
Sita	16	78	KTM

Task #5: Write SQL queries to display the records of students in the order of marks (both ascending and descending).

Task #6: Write SQL query to display the records of students in alphabetical order (both forward and reverse alphabetical order)

Task #7: Write SQL query to display details of a student with roll no 12.

Task #8: Write SQL query to display details of students whose name is “Ram”

Task #9: Write SQL query to add an attribute phone_no

Task #10: Write SQL query to drop the attribute address.

Task #1 Solution:

```
create database DBMS_BCT;
```

Task #2 Solution:

```
use DBMS_BCT;
```

Task #3 Solution:

```
create table student
(
name varchar(50),
roll int,
marks int,
address varchar(50)
);
```

Task #4 Solution:

```
insert into student values("Ram",12,98,"A");
insert into student values("Hari",13,77,"B");
insert into student values("Shyam",14,78,"C");
insert into student values("Gita",15,79,"D");
insert into student values("Rita",16,80,"E");
```

Task #5 Solution:

```
select * from student
order by marks;
```

Output:

name	roll	marks	address
Hari	13	77	B
Shyam	14	78	C
Gita	15	79	D
Rita	16	80	E
Ram	12	98	A

```
select * from student
order by marks desc;
```

Output:

name	roll	marks	address
Ram	12	98	A
Rita	16	80	E
Gita	15	79	D
Shyam	14	78	C
Hari	13	77	B

Task #6 Solution:

```
select * from student
order by name;
```

Output:

```
+-------+------+-------+---------+
| name  | roll | marks | address |
+-------+------+-------+---------+
| Gita  |   15 |    79 | D       |
| Hari  |   13 |    77 | B       |
| Ram   |   12 |    98 | A       |
| Rita  |   16 |    80 | E       |
| Shyam |   14 |    78 | C       |
+-------+------+-------+---------+
```

```
select * from student
order by name desc;
```

Output:

```
+-------+------+-------+---------+
| name  | roll | marks | address |
+-------+------+-------+---------+
| Shyam |   14 |    78 | C       |
| Rita  |   16 |    80 | E       |
| Ram   |   12 |    98 | A       |
| Hari  |   13 |    77 | B       |
| Gita  |   15 |    79 | D       |
+-------+------+-------+---------+
```

Task #7 Solution:

```
select * from student
where roll = 12;
```

Output:

```
+------+------+-------+---------+
| name | roll | marks | address |
+------+------+-------+---------+
| Ram  |   12 |    98 | A       |
+------+------+-------+---------+
```

Task #8 Solution:

```
select * from student
where name = 'Ram';
```

Output:

```
+------+------+-------+---------+
| name | roll | marks | address |
+------+------+-------+---------+
| Ram  |   12 |    98 | A       |
+------+------+-------+---------+
```

Task #9 Solution:

```
alter table student
add column phone_no varchar(10) default NULL;
```

Output:

name	roll	marks	address	phone_no
Ram	12	98	A	NULL
Hari	13	77	B	NULL
Shyam	14	78	C	NULL
Gita	15	79	D	NULL
Rita	16	80	E	NULL

Task #10 Solution:

```
alter table student
drop column address;
```

Output:

name	roll	marks	phone_no
Ram	12	98	NULL
Hari	13	77	NULL
Shyam	14	78	NULL
Gita	15	79	NULL
Rita	16	80	NULL

Design two additional SQL questions yourself with at least 5-7 tasks. Questions should be different from other questions in this lab report.

Lab 4

SQL Queries Set 2

In this lab students are expected to learn SQL queries related to aggregate functions, setting integrity constraints(such as primary key, foreign key etc)

Q_1. Create a table employee with following schema:

employee(name, eid, designation, salary)

Perform following tasks:

Task #1. Populate employee table with 10 or more records

Task #2. Write SQL query to retrieve all records from the table.

Task #3. Write SQL query to set salary of all employees whose designation is "Supervisor"

Task #4. Write SQL query to change the name of employee with eid=50 to "Hari"

Task #5. Write SQL query to delete the record of a employee with eid=10

Task #6. Write SQL query to display average salary of employees

Task #7. Write SQL query to display the no. of employees

Task #8. Write SQL query to display the total salary paid by the company.

Task #9. Write SQL query to increase the salary of all employees by 10%.

***Solution*:**

```
create table employee(
eid int not null primary key,
name varchar(50),
salary int,
designation varchar(50)
);
```

Task #1 Solution:

```
insert into employee values(12,"Ram",30000,"Peon");
insert into employee values(13,"Hari",12000,"Supervisor");
insert into employee values(14,"Shyam",13000,"Store Keeper");
insert into employee values(15,"Rita",14000,"Librarian");
insert into employee values(16,"Gita",15000,"Cook");
insert into employee values(17,"Sita",18000,"Gate Keeper");
insert into employee values(18,"Dinesh",12000,"Supervisor");
insert into employee values(19,"Nabin",12000,"Supervisor");
insert into employee values(50,"Ramesh",20000,"Admin Officer");
insert into employee values(10,"Shailesh",10000,"Receptionist");
```

Task #2 Solution:

```
select *from employee;
```

Output:

eid	name	salary	designation
10	Shailesh	10000	Receptionist
12	Ram	30000	Peon
13	Hari	12000	Supervisor
14	Shyam	13000	Store Keeper
15	Rita	14000	Librarian
16	Gita	15000	Cook
17	Sita	18000	Gate Keeper
18	Dinesh	12000	Supervisor
19	Nabin	12000	Supervisor
50	Ramesh	20000	Admin Officer

Task #3 Solution:

```
SET SQL_SAFE_UPDATES = 0;
update employee
set salary=50000
where designation="Supervisor";
```

Output:

eid	name	salary	designation
10	Shailesh	10000	Receptionist
12	Ram	30000	Peon
13	Hari	50000	Supervisor
14	Shyam	13000	Store Keeper
15	Rita	14000	Librarian
16	Gita	15000	Cook
17	Sita	18000	Gate Keeper
18	Dinesh	50000	Supervisor
19	Nabin	50000	Supervisor
50	Ramesh	20000	Admin Officer

Task #4 Solution:

```
update employee
set name="Hari"
where eid=50;
```

Output:

eid	name	salary	designation
10	Shailesh	10000	Receptionist
12	Ram	30000	Peon
13	Hari	50000	Supervisor
14	Shyam	13000	Store Keeper
15	Rita	14000	Librarian
16	Gita	15000	Cook
17	Sita	18000	Gate Keeper
18	Dinesh	50000	Supervisor
19	Nabin	50000	Supervisor
50	Hari	20000	Admin Officer

Task #5 Solution:

```
delete from employee
where eid=10;
```

Output:

eid	name	salary	designation
12	Ram	30000	Peon
13	Hari	50000	Supervisor
14	Shyam	13000	Store Keeper
15	Rita	14000	Librarian
16	Gita	15000	Cook
17	Sita	18000	Gate Keeper
18	Dinesh	50000	Supervisor
19	Nabin	50000	Supervisor
50	Hari	20000	Admin Officer

Task #6 Solution:

```
select avg(salary) from employee;
```

Output:

avg(salary)
28888.8889

Task #7 Solution:

```
select count(*) from employee;
```

Output:

```
+----------+
| count(*) |
+----------+
|        9 |
+----------+
```

Task #8 Solution:

```
select sum(salary) from employee;
```

Output:

```
+-------------+
| sum(salary) |
+-------------+
|      260000 |
+-------------+
```

Task #9 Solution:

```
update employee
set salary=1.1*salary;
```

Output:

```
+-----+--------+--------+---------------+
| eid | name   | salary | designation   |
+-----+--------+--------+---------------+
|  12 | Ram    |  33000 | Peon          |
|  13 | Hari   |  55000 | Supervisor    |
|  14 | Shyam  |  14300 | Store Keeper  |
|  15 | Rita   |  15400 | Librarian     |
|  16 | Gita   |  16500 | Cook          |
|  17 | Sita   |  19800 | Gate Keeper   |
|  18 | Dinesh |  55000 | Supervisor    |
|  19 | Nabin  |  55000 | Supervisor    |
|  50 | Hari   |  22000 | Admin Officer |
+-----+--------+--------+---------------+
```

Q2. Consider the following tables:

Student

Name	***Roll***	***CID***
Ram	1	S001
Shyam	2	S002
Hari	3	S003
Rita	4	S001
Sita	5	S002
Gita	6	S003

Course

CID	***Cname***
S001	DBMS
S002	TOC
S003	CN
S004	OS
S005	Extra
S006	AI

Perform the following tasks

1 Create two tables with following schema:
Student(Name, Roll, CID)

Course(CID, Cname)

2 Set CID of relation Student as foreign key which references CID of relation Course.
3 Populate the tables with records.
4 Write SQL query to retrieve records of all students along with course they took.
5 Write SQL query to display details of all students who took DBMS course.
6 Write SQL query to delete the table Course and comment on the result.
7 Write SQL query to insert a record ('Kartik', 7,'S007') into student table and comment on the result.

Solution:

Task #1 and 2 Solution:

```
create database dbms_bct;
use dbms_bct;

create table course
(
CID varchar(10),
Cname varchar(50),
primary key(CID)
);

create table student
(
name varchar(50),
roll int primary key,
CID varchar(10) ,
foreign key(CID) references Course(CID)
);
```

Task #3 Solution:

```
insert into course values('S001','DBMS');
insert into course values('S002','TOC');
insert into course values('S003','CN');
insert into course values('S004','OS');
insert into course values('S005','Extra');
insert into course values('S006','AI');


insert into student values('Ram',1,'S001');
insert into student values('Shyam',2,'S002');
insert into student values('Hari',3,'S003');
insert into student values('Rita',4,'S001');
insert into student values('Sita',5,'S002');
insert into student values('Gita',6,'S003');
```

Task # 4 Solution:

```
select * from student natural join course;
```

Output:

```
+------+-------+------+-------+
| CID  | name  | roll | Cname |
+------+-------+------+-------+
| S001 | Ram   |    1 | DBMS  |
| S002 | Shyam |    2 | TOC   |
| S003 | Hari  |    3 | CN    |
| S001 | Rita  |    4 | DBMS  |
| S002 | Sita  |    5 | TOC   |
| S003 | Gita  |    6 | CN    |
+------+-------+------+-------+
```

Task #5 Solution:

```
select * from student natural join course
where cname='DBMS';
```

Output:

```
+------+------+------+-------+
| CID  | name | roll | Cname |
+------+------+------+-------+
| S001 | Ram  |    1 | DBMS  |
| S001 | Rita |    4 | DBMS  |
+------+------+------+-------+
```

Task #6 Solution:

```
drop table course;
```

Output:

```
# generates following error message
Cannot drop table 'course' referenced by a foreign key
constraint 'student_ibfk_1' on table 'student'.
```

Task #7 Solution:

```
insert into student values('Kartik',7,'S007');
```

Output:

```
#Foreign key constraint fails
```

Lab 5

SQL Queries Set 3

In this lab students are expected to learn SQL queries related to nested query, aggregate function, as, like and having clause.

Q_1. Consider the following COURSE table given below:

CourseID	CourseName	CourseFee	Instructor
11	Programming	10000	Ravi
12	C#	15000	Jiban
13	Java	18000	Janak
14	XML	5000	Ravi
15	Database	12500	Han
16	ASP.net	10000	Shyam

Now answer the following questions:

a) Write SQL syntax to create the given table and insert few records in it.

```
create table COURSE
(
CourseID integer primary key,
CourseName varchar(50),
CourseFee integer,
Instructor varchar(50)
);

insert into COURSE values(11,'Programming',10000,'Ravi');
insert into COURSE values(12,'C#',15000,'Jiban');
insert into COURSE values(13,'Java',18000,'Janak');
insert into COURSE values(14,'XML',5000,'Ravi');
insert into COURSE values(15,'Database',12500,'Han');
insert into COURSE values(16,'ASP.NET',10000,'Shyam');
```

Output:

```
+----------+-------------+-----------+------------+
| CourseID | CourseName  | CourseFee | Instructor |
+----------+-------------+-----------+------------+
|       11 | Programming |     10000 | Ravi       |
|       12 | C#          |     15000 | Jiban      |
|       13 | Java        |     18000 | Janak      |
|       14 | XML         |      5000 | Ravi       |
|       15 | Database    |     12500 | Han        |
|       16 | ASP.NET     |     10000 | Shyam      |
+----------+-------------+-----------+------------+
```

b) Write SQL syntax to update the instructor to Ramesh whose CourseID is 12.

Solution:

```
update COURSE
set Instructor='Ramesh'
```

```
where CourseID=12;
```

Output:

CourseID	CourseName	CourseFee	Instructor
11	Programming	10000	Ravi
12	C#	15000	Ramesh
13	Java	18000	Janak
14	XML	5000	Ravi
15	Database	12500	Han
16	ASP.NET	10000	Shyam

c) Write SQL query to retrieve all information of courses that have more than one instructor.

Solution:

```
select count(instructor), instructor from Course
group by instructor
having count(instructor)>1;
```

d) Write SQL query to find the name of course whose fee is less than the average fee of all the courses.

Solution:

```
select CourseName from COURSE
where CourseFee<(Select avg(CourseFee) from COURSE);
```

Output:

CourseName
Programming
XML
ASP.NET

e) Write SQL query to count distinct number of instructors in the course table.

Solution:

```
select count(distinct Instructor) from COURSE;
```

Output:

count(distinct Instructor)
5

Q_2. Consider the following relation and attributes

PRODUCT

PID	Varchar(5)
ProductName	Varchar(40)
Unit Price	number(5)

a) Develop DDL in SQL to implement above schema.

Solution:

```
create table PRODUCT
(
PID Varchar(5),
ProductName Varchar(40),
UnitPrice numeric(5)
);
```

b) Develop SQL Queries to insert a new product named Smartphone with PID 12345 and price of 25000.

Solution:

```
insert into PRODUCT(PID,ProductName,UnitPrice)
values(12345,'Smartphone',25000);
```

c) Develop SQL queries to list product with unit price greater than 200.

Solution:

```
select * from Product
where UNITPRICE>200
```

d) Develop SQL queries to list products sorted by the "ProductName" column.

Solution:

```
select * from Product
order by ProductName;
```

e) Develop SQL queries to list details of product whose price I sgreater than the average price of all products.

Solution:

```
select * from PRODUCT
where UNITPRICE>(select avg(unitprice) from PRODUCT);
```

f) Develop SQL queries to delete all rows in a table without deleting the table.

Solution:

```
delete from Product;
```

g) Develop SQL queries to delete the table named product from the database.

Solution:

```
drop table PRODUCT;
```

Q_3. Consider the relational database where the primary keys are highlighted. Give an expression in SQL for each of the following queries:

Employee(**person_name**, street, city)

Works(**person_name**, company_name, salary)

Company(**company_name**, city)

Manages(**person_name**,manager_name)

a) Implement DDL for the given relation.

Solution:

```
create table Employee
(
person_name varchar(30) primary key,
street varchar (50),
city varchar(30)
);

create table Works
(
person_name varchar(30) primary key,
company_name varchar (50),
salary numeric
);

create table Company
(
company_name varchar(50) primary key,
city varchar(50)
);

create table Manages
(
person_name varchar(30) primary key,
manager_name varchar(30)
);
```

b) Find the names of all employees who work for the First Bank Corporation.

Solution:

```
select person_name from WORKS where
company_name='First Bank Corporation';
```

c) Find the names of all employees who live in the same city and on the same street as do their managers.

Solution:

```
Select E1.person_name
From Employee as E1, Employee as E2, Manages as M
Where E1.person_name=M.person_name and
E2.person_name=M.manager_name
and E1.stree=E2.street and E1.city=E2.city
```

d) Find the names, street address and cities of residence of all employees who work for First Bank Corporation and earn more than $10,000 per annum.

Solution:

```
select *from
Employee
inner join WORKS
on Employee.person_name=Works.PERSON_NAME
where Works.COMPANY_NAME='First Bank Corporation' and
Works.salary>10000;
```

e) Give all employees of First Bank Corporation a 10 percent salary raise.

Solution:

```
update WORKS SET SALARY=1.1*SALARY
WHERE COMPANY_NAME='First Bank Corporation'
```

f) Delete all the tuples in the works relation for employees of Small Bank Corporation

Solution:

```
delete from Works where COMPANY_NAME='Small Bank Corporation';
```

Q_4. Create a student table with following schema

STUDENT(name, roll, marks, address);

a) Write SQL query to create the table.

Solution:

```
create table student
(
name varchar(20),
roll integer primary key,
marks integer,
address varchar(50)
);
```

b) Write SQL queries to populate the table with 10 records.

Solution:

```
insert into student values('Ram',12,98,'Palpa');
insert into student values('Shyam',13,99,'KTM');
```

```
insert into student values('Hari',14,88,'PKR');
insert into student values('Rita',15,57,'BRT');
insert into student values('Sita',16,66,'BKT');
insert into student values('Gita',17,29,'KTM');
insert into student values('Anita',18,54,'PKR');
insert into student values('Dinesh',19,49,'BIR');
insert into student values('Kartik',20,34,'JHP');
insert into student values('Tarun',21,39,'PKR');
```

After the execution of above commands the state of the database is:

name	roll	marks	address
Ram	12	98	Palpa
Shyam	13	99	KTM
Hari	14	88	PKR
Rita	15	57	BRT
Sita	16	66	BKT
Gita	17	29	KTM
Anita	18	54	PKR
Dinesh	19	49	BIR
Kartik	20	34	JHP
Tarun	21	39	PKR

c) Write SQL queries to list the details of all the student whose name starts with 'R'

Solution:

```
select * from student
where name like 'R%';
```

Output:

name	roll	marks	address
Ram	12	98	Palpa
Rita	15	57	BRT

d) Write SQL queries to display the details of all the student whose name ends with 'ita'

Solution:

```
select * from student
where name like '%ita';
```

Output:

name	roll	marks	address
Rita	15	57	BRT
Sita	16	66	BKT
Gita	17	29	KTM
Anita	18	54	PKR

e) Write SQL queries to count the no. of students whose name starts with 'R'

Solution:

```
select count(*) from student
where name like 'R%';
```

Output:

count(*)
2

f) Write SQL queries to count the no. of students whose name ends with 'ita'

Solution:

```
select count(*) from student
where name like '%ita';
```

Output:

count(*)
4

For Questions 2 and 3 generate the output yourself.

Lab 6

SQL Queries Set 4

In this lab, students are expected to learn queries related to cartesian product, join(natural join, theta join, equi join, left outer join, right outer join, full outer join etc), and set operations(such as union, intersection and difference).

Q_1. Consider following tables:

Students

stud#	name	course
100	Fred	PH
200	Dave	CM
300	Bob	CM

Courses

course#	name
PH	Pharmacy
CM	Computing

a. Create the schema for the tables Students and Courses.

Solution:

```
Create table Students(
studno integer primary key,
name varchar(50),
course varchar(4)
);

create table Courses(
courseno varchar(4) primary key,
name varchar(50)
);
```

b. Populate the tables with above indicated values.

Solution:

```
insert into Students values(100,'Fred','PH');
insert into Students values(200,'Dave','CM');
insert into Students values(300,'Bob','CM');

insert into Courses values('PH','Pharmacy');
insert into Courses values('CM','Computing');
```

c. Write SQL query to display the Cartesian product of two tables.

Solution:

```
select * from Students, Courses;
```

Output:

studno	name	course	courseno	name
100	Fred	PH	PH	Pharmacy
100	Fred	PH	CM	Computing
200	Dave	CM	PH	Pharmacy
200	Dave	CM	CM	Computing
300	Bob	CM	PH	Pharmacy
300	Bob	CM	CM	Computing

d. Write SQL query to display the result of the theta join operation

Students $\bowtie_{\text{stud\#=200}}$ **Courses**

Solution:

```
select * from Students, Courses
where studno = 200;
```

Output:

studno	name	course	courseno	name
200	Dave	CM	CM	Computing
200	Dave	CM	PH	Pharmacy

e. Write SQL query to display the result of the equi join operation

Students $\bowtie_{\text{course=course\#}}$ **Courses**

Solution:

studno	name	course	courseno	name
100	Fred	PH	PH	Pharmacy
200	Dave	CM	CM	Computing
300	Bob	CM	CM	Computing

Q_2. Consider following tables:

r

a	*b*
a1	b1
a2	b2
a3	b3

s

b	*c*
b1	c1
b2	c2
b4	c4

a. Write SQL query to create the schemas for tables *r* and *s* and to populate the indicated values.

Solution:

```
create table r(
a varchar(4),
b varchar(4)
);

create table s(
b varchar(4),
c varchar(4)
);

insert into r values('a1','b1');
insert into r values('a2','b2');
insert into r values('a3','b3');

insert into s values('b1','c1');
insert into s values('b2','c2');
insert into s values('b4','c4');
```

b. Write SQL query to display the result of the natural join operation r ⋈ s

Solution:

```
select * from r natural join s;
```

Output:

```
+------+------+------+
| b    | a    | c    |
+------+------+------+
| b1   | a1   | c1   |
| b2   | a2   | c2   |
+------+------+------+
```

c. Write SQL query to display the result of the left outer join operation r ⟕ s

Solution:

```
select a,r.b,s.c from r left join s on r.b=s.b;
```

Output:

```
+------+------+------+
| a    | b    | c    |
+------+------+------+
| a1   | b1   | c1   |
| a2   | b2   | c2   |
| a3   | b3   | NULL |
+------+------+------+
```

d. Write SQL query to display the result of the right outer join operation r ⟖ s

Solution:

```
select a,s.b,c from r right join s on r.b=s.b;
```

Output:

```
+------+------+------+
| a    | b    | c    |
+------+------+------+
| a1   | b1   | c1   |
| a2   | b2   | c2   |
| NULL | b4   | c4   |
+------+------+------+
```

e. Write SQL query to display the result of the full outer join operation r ⋈ s

Solution:

```
create view g as
(select a,r.b,s.c from r left join s on r.b=s.b);

create view h as
(select a,s.b,c from r right join s on r.b=s.b);

select * from g union select * from h;
```

Output:

```
+------+------+------+
| a    | b    | c    |
+------+------+------+
| a1   | b1   | c1   |
| a2   | b2   | c2   |
| a3   | b3   | NULL |
| NULL | b4   | c4   |
+------+------+------+
```

Q_3. Consider following tables:

First

id	*name*
1	A
2	B
3	C
4	D

Second

id	*Name*
2	B
3	C
5	E
6	F

a. Write SQL query to create schema for the tables First and Second.

Solution:

```
create table First(
id integer,
name varchar(4)
);

create table Second(
id integer,
name varchar(4)
```

```
);
```

b. Write SQL query to populate the indicated values.

Solution:

```
insert into First values(1,'A');
insert into First values(2,'B');
insert into First values(3,'C');
insert into First values(4,'D');

insert into Second values(2,'B');
insert into Second values(3,'C');
insert into Second values(5,'E');
insert into Second values(6,'F');
```

c. Write SQL query to find the union of two tables.

Solution:

```
select * from First union Select * from Second;
```

Output:

id	name
1	A
2	B
3	C
4	D
5	E
6	F

d. Write SQL query to find the intersection of the two tables.

Solution:

```
select * from First intersect Select * from Second;
```

or alternatively following query can be written to generate same output:

```
select * from First where id in(Select id from Second);
```

Output:

id	name
2	B
3	C

e. Write SQL query to find the difference of the two tables.

Solution:

```
select * from First where id not in(Select id from Second);
```

Output:

```
+------+------+
| id   | name |
+------+------+
|    1 | A    |
|    4 | D    |
+------+------+
```

Lab 7
SQL Queries Set 5

Design at least five SQL questions related to SQL clauses such as *group by*, *having*, *as*, *exists*, *some*, *all* etc.
Design one SQL question related to creating a view, displaying records from a view, and dropping a view.

Lab 8
Relational Database Design using ER diagram

In this lab, students are expected to learn how to draw ER diagram using draw.io
Following are the tasks covered in this lab:
Task #1: Draw an ER diagram for **COMPANY** database.
Task #2: Draw an ER diagram for **MOVIE** database.
Task #3: Draw an ER diagram for **AIRLINE RESERVATION SYSTEM** database.
Task #4: Draw an ER diagram for **HOSPITAL MANAGEMENT SYSTEM** database.
Task #5: Draw an ER diagram for **LIBRARY MANAGEMENT SYSTEM** database.
Task #6: Draw an ER diagram for **UNIVERSITY** database.
Task #7: Draw an ER diagram for **BANK** database.
Task #8: Draw an ER diagram of any system involving **Specialization and Generalization**.

It is to be noted that your image must be in vector format.

Lab 9
Group Project and presentation

In this lab, students are expected to develop a group project where you are required to design ER diagram for any system other than that covered in previous labs. Then the concept of mapping ER diagram components to relational model must be applied. Finally draw a detailed schema diagram of the design outlining key attributes and foreign key constraints.