# CS313: DataBases and Information Systems Lab Lab Assignment 4

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# 1 Creating user called universityDB0004

## 1.1 Query

```
CREATE USER 'universityDB0004'@'localhost' IDENTIFIED BY 'password';
GRANT ALL PRIVILEGES ON university.* TO 'universityDB0004'@'localhost';
```

# 2 Creating database called university

#### 2.1 Query

```
CREATE DATABASE university;
SHOW DATABASES;
```

```
mysql> SHOW DATABASES;
 Database
 information_schema
 mydb
 mysql
 performance_schema
 phpmyadmin
 test
6 rows in set (0.00 sec)
mysql> CREATE DATABASE university;
Query OK, 1 row affected (0.00 sec)
mysql> SHOW DATABASES;
 Database
 information_schema
 mydb
 mysql
 performance_schema
 phpmyadmin
 test
 university
7 rows in set (0.00 sec)
```

# 3 Connecting to database called university

#### 3.1 Query

```
USE university;
SELECT DATABASE(); -- to see selected database.
```

```
[mysql> USE university;
Database changed
[mysql> SELECT DATABASE();
+----+
| DATABASE() |
+----+
| university |
+----+
1 row in set (0.00 sec)
```

# 4 Creating tables in the database using DDL.sql file

#### 4.1 Query

source /Users/apple/Desktop/5th sem/CS313 DBIS lab/assigns/assign4/DDL.sql; show tables;

```
mysql> source /Users/apple/Desktop/5th sem/CS313 DBIS lab/assigns/assign4/DDL.sql;
Query OK, 0 rows affected (0.06 sec)
Query OK, 0 rows affected (0.03 sec)
Query OK, 0 rows affected (0.02 sec)
Query OK, 0 rows affected (0.03 sec)
[mysql> SHOW TABLES;
 Tables_in_university |
 advisor
 classroom
  course
  department
  instructor
  prereq
  section
  student
  takes
  teaches
 time_slot
11 rows in set (0.00 sec)
```

# 5 Loading the data into tables using insert.sql

#### 5.1 Query

```
source /Users/apple/Desktop/5th sem/CS313 DBIS lab
/assigns/assign4/InsertValues.sql
```

```
mysql> source /Users/apple/Desktop/5th sem/CS313 DBIS lab/assigns/assign4/InsertValues.sql
Query OK, 0 rows affected (0.01 sec)
Query OK, 0 rows affected (0.00 sec)
Query OK, 0 rows affected (0.01 sec)
Query OK, 0 rows affected (0.00 sec)
Query OK, 1 row affected (0.00 sec)
Query OK, 1 row affected (0.01 sec)
Query OK, 1 row affected (0.00 sec)
Query OK, 1 row affected (0.00 sec)
Query OK, 1 row affected (0.00 sec)
Query OK, 1 row affected (0.01 sec)
Query OK, 1 row affected (0.00 sec)
```

# 6 Details of all the tables using information\_schema

## 6.1 Query

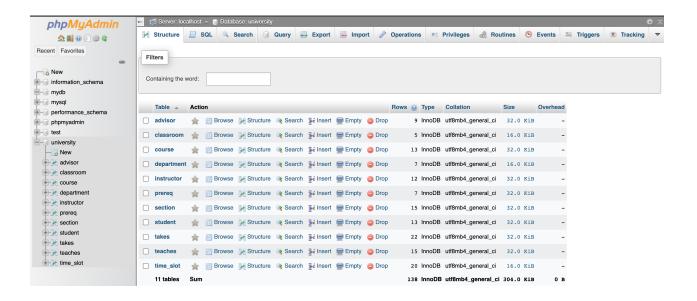
```
SELECT table_name, column_name, data_type
FROM information_schema.columns
WHERE table_name = 'student' || table_name = 'advisor' ||
    table_name = 'classroom' || table_name = 'course' ||
    table_name = 'department' || table_name = 'instructor' ||
    table_name = 'prereq' || table_name = 'section' ||
    table_name = 'takes' || table_name = 'teaches' ||
    table_name = 'time_slot';
```

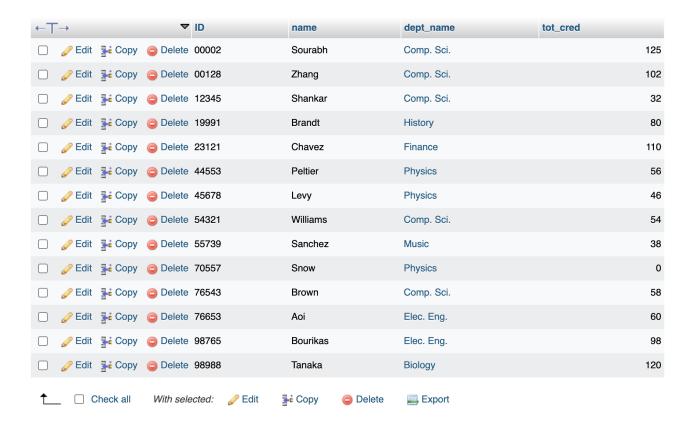
```
SCHOOL Teaching.cames_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_repares_clime_re
```

# 7 Operations using phpMyAdmin tool

#### 7.1 Query

```
INSERT INTO student
    VALUES('00002', 'Sourabh', 'Comp. Sci.', 125);
INSERT INTO course
   VALUES('CS-301', 'Computer Architecture', 'Comp. Sci.', 6);
INSERT INTO instructor
   VALUES('10001', 'Rajshekhar K', 'Comp. Sci.', 70000);
INSERT INTO teaches
    VALUES('10001', 'CS-301', '2', 'Spring', 2020);
INSERT INTO prereq
    VALUES('CS-301', 'CS-101');
INSERT INTO section
   VALUES('CS-301', '2', 'Spring', 2020, 'Watson', '120', 'B');
INSERT INTO classroom
   VALUES('Newton', '150', 100);
INSERT INTO department
   VALUES('MMAE', 'Newton', 95000);
INSERT INTO takes
   VALUES('00002', 'CS-301', '2', 'Spring', 2020, 'A+');
INSERT INTO advisor
   VALUES('00002', '10001');
INSERT INTO time_slot
   VALUES('B', 'M', 8, 30, 9, 30);
SELECT * FROM student;
SELECT * FROM course;
SELECT * FROM instructor;
SELECT * FROM teaches;
SELECT * FROM prereq;
SELECT * FROM section;
SELECT * FROM classroom;
SELECT * FROM department;
SELECT * FROM takes;
SELECT * FROM advisor;
SELECT * FROM time_slot;
```

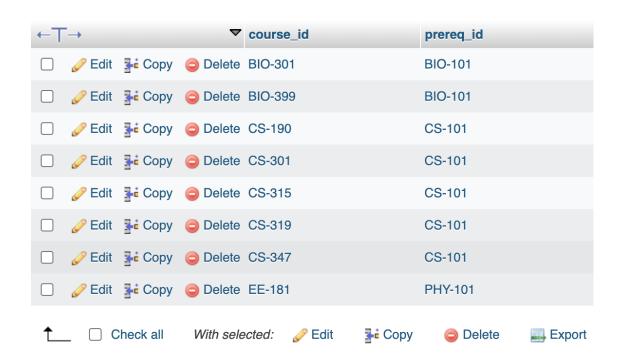


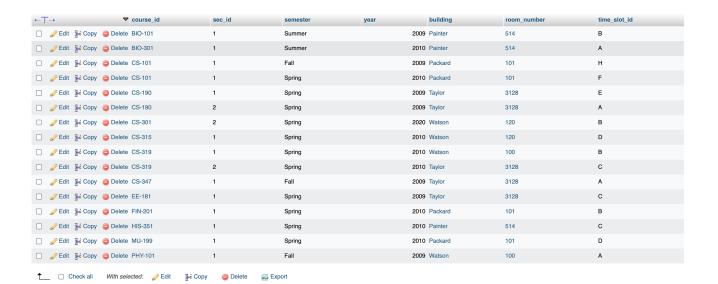


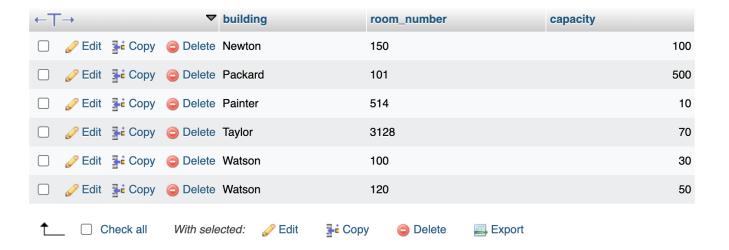
$\leftarrow T \rightarrow$	~	course_id	title	dept_name	credits
☐	Copy 🔵 Delete	BIO-101	Intro. to Biology	Biology	4
☐ Ø Edit	Copy 🔵 Delete	BIO-301	Genetics	Biology	4
☐ <i>⊘</i> Edit	Copy 🔵 Delete	BIO-399	Computational Biology	Biology	3
☐ Ø Edit	Copy   Delete	CS-101	Intro. to Computer Science	Comp. Sci.	4
□ Ø Edit 3	Copy   Delete	CS-190	Game Design	Comp. Sci.	4
□ Ø Edit 3	Copy 🔘 Delete	CS-301	Computer Architecture	Comp. Sci.	6
☐	Copy 🔵 Delete	CS-315	Robotics	Comp. Sci.	3
☐	Copy 🔘 Delete	CS-319	Image Processing	Comp. Sci.	3
☐ Ø Edit 3	Copy 🔘 Delete	CS-347	Database System Concepts	Comp. Sci.	3
☐	Copy 🔘 Delete	EE-181	Intro. to Digital Systems	Elec. Eng.	3
☐	Copy 🔵 Delete	FIN-201	Investment Banking	Finance	3
☐	Copy   Delete	HIS-351	World History	History	3
☐	Copy 向 Delete	MU-199	Music Video Production	Music	3
☐	Copy   Delete	PHY-101	Physical Principles	Physics	4
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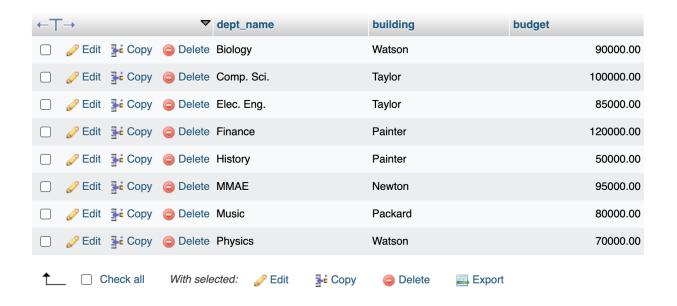
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		<b>≩</b> Copy	Delete	10001		Rajshekha	ır K	Comp. Sci.		70000.00
	Edit	<b>≩</b> € Сору	Delete	10101		Srinivasan		Comp. Sci.		65000.00
		<b>≩</b> Сору	Delete	12121		Wu		Finance		90000.00
	Edit	<b>≩</b> € Сору	Delete	15151		Mozart		Music		40000.00
	Edit	<b>З</b> Сору	Delete	22222		Einstein		Physics		95000.00
	Edit	<b>≩</b> Сору	Delete	32343		El Said		History		60000.00
	Edit	<b>≩</b> сору	Delete	33456		Gold		Physics		87000.00
	Edit	<b>≩</b> сору	Delete	45565		Katz		Comp. Sci.		75000.00
	Edit	<b>≩</b> сору	Delete	58583		Califieri		History		62000.00
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	Edit	<b>≩</b> Copy	Delete	98345		Kim		Elec. Eng.		80000.00
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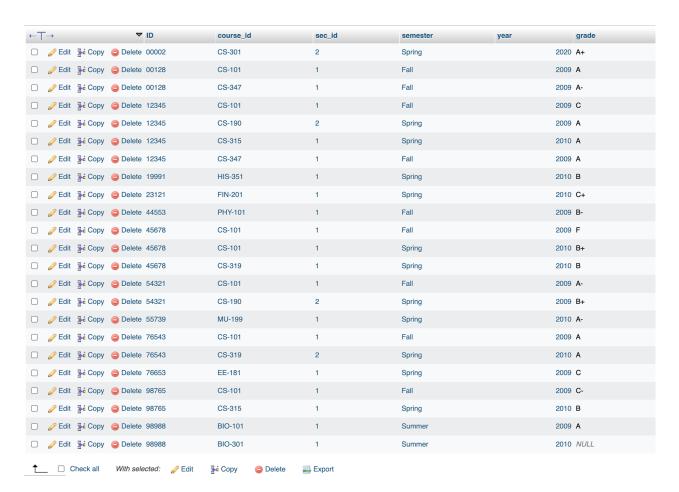
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☐	1 CS-101	1	Fall	2009
☐	1 CS-315	1	Spring	2010
☐	1 CS-347	1	Fall	2009
☐	1 FIN-201	1	Spring	2010
☐	1 MU-199	1	Spring	2010
☐	2 PHY-101	1	Fall	2009
☐ Ø Edit ♣ Copy ☐ Delete 3234	3 HIS-351	1	Spring	2010
☐	5 CS-101	1	Spring	2010
☐	5 CS-319	1	Spring	2010
☐ Ø Edit ♣ Copy ⊜ Delete 76766	6 BIO-101	1	Summer	2009
☐ Ø Edit ♣ Copy ☐ Delete 76766	6 BIO-301	1	Summer	2010
☐	1 CS-190	1	Spring	2009
☐	1 CS-190	2	Spring	2009
☐	1 CS-319	2	Spring	2010
☐	5 EE-181	1	Spring	2009
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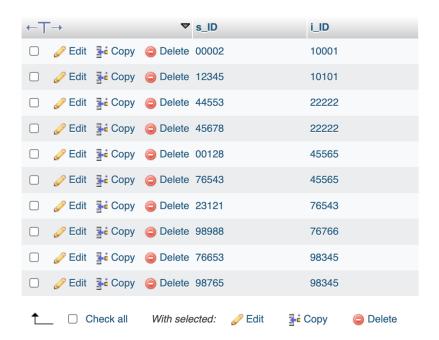














# 7.3 Inserting more data into tables for question 8

```
-- insertions for 8a
INSERT INTO department VALUES('Civil', 'Watson', '70000');
INSERT INTO course
    VALUES('CV-101', 'Construction Engineering', 'Civil', '5');
INSERT INTO section
    VALUES('CV-101', '2', 'Spring', '2009', 'Taylor', '3128', 'C');
INSERT INTO section
    VALUES('CV-101', '2', 'Winter', '2009', 'Taylor', '3128', 'C');
INSERT INTO teaches VALUES('45565', 'CV-101', '2', 'Spring', '2009');
INSERT INTO teaches VALUES('10101', 'CV-101', '2', 'Winter', '2009');
-- insertions for 8b
INSERT INTO course
VALUES('CS-303', 'Introduction to Database Systems', 'Comp. Sci.', 6);
-- insertions for 8c
INSERT INTO department VALUES ('Chemical', 'Watson', '1000000');
INSERT INTO instructor
    VALUES ('11111', 'Schrodinger', 'Chemical', '90000');
INSERT INTO instructor
    VALUES ('33333', 'Avogadro', 'Chemical', '80000');
-- insertions for 8d
INSERT INTO student VALUES('20001', 'Abhishek', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20002', 'Siddharth', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20003', 'Bharath', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20004', 'Chirantan', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20005', 'Ankit', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20006', 'Chirag', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20007', 'Dibyashu', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20008', 'Apurva', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20009', 'Ayush', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20010', 'Abhineet', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20011', 'Lokesh', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20012', 'Aryaman', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20013', 'Hrishikesh', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20014', 'Devdatt', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20015', 'Devesh', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20016', 'Aryan', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20017', 'Surzith', 'Comp. Sci.', 150);
INSERT INTO student VALUES('20018', 'Nirmit', 'Comp. Sci.', 150);
```

```
INSERT INTO section
    VALUES('CS-101', '1', 'Fall', 2007, 'Watson', '100', 'E');
INSERT INTO section
    VALUES('CS-190', '1', 'Fall', 2007, 'Watson', '100', 'B');
INSERT INTO teaches VALUES('10101', 'CS-101', '1', 'Fall', '2007');
INSERT INTO teaches VALUES('10101', 'CS-190', '1', 'Fall', '2007');
INSERT INTO takes VALUES('20001', 'CS-101', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20002', 'CS-101', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20003', 'CS-101', '1', 'Fall', 2007, 'A');
INSERT INTO takes VALUES('20004', 'CS-101', '1', 'Fall', 2007, 'B');
INSERT INTO takes VALUES('20005', 'CS-101', '1', 'Fall', 2007, 'B+');
INSERT INTO takes VALUES('20006', 'CS-101', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20007', 'CS-101', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20008', 'CS-101', '1', 'Fall', 2007, 'A');
INSERT INTO takes VALUES('20009', 'CS-101', '1', 'Fall', 2007, 'B');
INSERT INTO takes VALUES('20010', 'CS-101', '1', 'Fall', 2007, 'B+');
INSERT INTO takes VALUES('20011', 'CS-101', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20012', 'CS-101', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20013', 'CS-101', '1', 'Fall', 2007, 'A');
INSERT INTO takes VALUES('20014', 'CS-101', '1', 'Fall', 2007, 'B');
INSERT INTO takes VALUES('20015', 'CS-101', '1', 'Fall', 2007, 'B+');
INSERT INTO takes VALUES('20016', 'CS-101', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20017', 'CS-101', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20018', 'CS-101', '1', 'Fall', 2007, 'A');
INSERT INTO takes VALUES('20002', 'CS-190', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20001', 'CS-190', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20003', 'CS-190', '1', 'Fall', 2007, 'A');
INSERT INTO takes VALUES('20004', 'CS-190', '1', 'Fall', 2007, 'B');
INSERT INTO takes VALUES('20005', 'CS-190', '1', 'Fall', 2007, 'B+');
INSERT INTO takes VALUES('20006', 'CS-190', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20007', 'CS-190', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20008', 'CS-190', '1', 'Fall', 2007, 'A');
INSERT INTO takes VALUES('20009', 'CS-190', '1', 'Fall', 2007, 'B');
INSERT INTO takes VALUES('20010', 'CS-190', '1', 'Fall', 2007, 'B+');
INSERT INTO takes VALUES('20011', 'CS-190', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20012', 'CS-190', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20013', 'CS-190', '1', 'Fall', 2007, 'A');
INSERT INTO takes VALUES('20014', 'CS-190', '1', 'Fall', 2007, 'B');
INSERT INTO takes VALUES('20015', 'CS-190', '1', 'Fall', 2007, 'B+');
INSERT INTO takes VALUES('20016', 'CS-190', '1', 'Fall', 2007, 'A+');
INSERT INTO takes VALUES('20017', 'CS-190', '1', 'Fall', 2007, 'A+');
```

# 8 SQL queries on phpMyAdmin

8.1 Find the course\_id, title, instructor\_id and name of those instructors who are from CSE department but are teaching a course of Civil department in the year 2009. Arrange results in ascending order of instructor names.

#### Query

course_id	title	ID	name 🔺 1
CV-101	Construction Engineering	45565	Katz
CV-101	Construction Engineering	10101	Srinivasan

8.2 Add a new course with course\_id as CS-333 (with suitable values for other attributes) for the CSE department which will have CS-303 as a prerequisite. Write insert statements for the same.

# Query

```
INSERT INTO course
    VALUES('CS-333', 'Advanced Database Systems', 'Comp. Sci.', 6);
INSERT INTO prereq
    VALUES('CS-333', 'CS-303');
SELECT *
FROM course NATURAL JOIN prereq;
```

course_id	title	dept_name	credits	prereq_id
BIO-301	Genetics	Biology	4	BIO-101
BIO-399	Computational Biology	Biology	3	BIO-101
CS-190	Game Design	Comp. Sci.	4	CS-101
CS-301	Computer Architecture	Comp. Sci.	6	CS-101
CS-315	Robotics	Comp. Sci.	3	CS-101
CS-319	Image Processing	Comp. Sci.	3	CS-101
CS-333	Advanced Database Systems	Comp. Sci.	6	CS-303
CS-347	Database System Concepts	Comp. Sci.	3	CS-101
EE-181	Intro. to Digital Systems	Elec. Eng.	3	PHY-101

# 8.3 Update salaries of instructors by 10% if their departments have a budget of more than 900000 rupees. Write the update statements for the same.

#### Query

dept_name	building	budget	ID	name	salary
Chemical	Watson	1000000.00	11111	Schrodinger	90000.00
Chemical	Watson	1000000.00	33333	Avogadro	80000.00

Figure 1: Table before updation

dept_name	building	budget	ID	name	salary
Chemical	Watson	1000000.00	11111	Schrodinger	99000.00
Chemical	Watson	1000000.00	33333	Avogadro	88000.00

Figure 2: Table after updation

8.4 Find CSE department courses (id and title) and number of students taking that course in the year 2007 and semester Fall where the number is greater than 15. Arrange the results in ascending order of course id.

#### Query

```
SELECT *
FROM (SELECT course.course_id, course.title
    FROM course NATURAL JOIN section
    WHERE dept_name = 'Comp. Sci.' AND
        semester = 'Fall' AND
        year = '2007') as CSE_courses NATURAL JOIN
    (SELECT course_id, COUNT(ID) as `Number of students`
    FROM takes
    GROUP BY course_id
    HAVING COUNT(ID) > 15) as courses_15
ORDER BY CSE_courses.course_id ASC;
```

course_id 🔺 1	title	Number of students
CS-101	Intro. to Computer Science	25
CS-190	Game Design	19