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Subject: DBMS Lab Assignment 03

Table Creation Code:

```
CREATE TABLE departments
(
    dept_id INT AUTO_INCREMENT NOT NULL PRIMARY KEY,
    dept_name VARCHAR(200)
);

CREATE TABLE professors
(
    prof_id INT AUTO_INCREMENT NOT NULL PRIMARY KEY,
    prof_fname VARCHAR(200),
    prof_lname VARCHAR(200),
    dept_id INT NOT NULL,
    designation VARCHAR(200),
    salary DECIMAL(5, 2),
    doj DATE,
    email VARCHAR(200),
    phone VARCHAR(30),
    city VARCHAR(100),
    FOREIGN KEY (dept_id) REFERENCES departments(dept_id) ON DELETE CASCADE
);

CREATE TABLE works
(
    prof_id INT NOT NULL,
    dept_id INT NOT NULL,
    duration_yrs INT NOT NULL,
    FOREIGN KEY (prof_id) REFERENCES professors(prof_id) ON DELETE CASCADE,
    FOREIGN KEY (dept_id) REFERENCES departments(dept_id) ON DELETE CASCADE
);

CREATE TABLE shift
(
    prof_id INT NOT NULL,
    shift VARCHAR(100),
    working_hours INT,
    FOREIGN KEY (prof_id) REFERENCES professors(prof_id) ON DELETE CASCADE
```

```
);
```

Data Insertion Code:

```
INSERT INTO departments(dept_name)
VALUES
('CSE'),
('Chem Eng.'),
('EE'),
('AE'),
('Civil Eng.');
```

```
INSERT INTO professors(prof_fname, prof_lname, dept_id, designation, salary, email, phone, city, doj)
```

```
VALUES
('Sudarshan', 'Kumar', 4, 'HOD', 40.41, 'head.aero@iitb.ac.in', '(+91 22) 25767124 (0)', 'Mumbai', '2010-08-01'),
('Madhu', 'Vinjamur', 2, 'HOD', 40.41, 'head.chem@iitb.ac.in', '(+91 22) 25767124 (0)', 'Mumbai', '2008-09-01'),
('Deepankar', 'Choudhury', 5, 'HOD', 40.41, 'head.civil@iitb.ac.in', '(+91 22) 25767124 (0)', 'Mumbai', '2001-01-01'),
('Umesh', 'Bellur', 1, 'HOD', 40.41, 'head.cse@iitb.ac.in', '(+91 22) 25767124 (0)', 'Mumbai', '2009-08-01'),
('Kishore', 'Chatterjee', 3, 'HOD', 40.41, 'head.ee@iitb.ac.in', '(+91 22) 25767124 (0)', 'Mumbai', '2005-03-01'),
('Vinay', 'Ribeiro', 1, 'AP', 30.31, 'vinayr@cse.iitb.ac.in', '(+91 22) 25767124 (0)', 'Mumbai', '2015-01-01'),
('Vivek', 'Agarwal', 3, 'Professor', 35.41, 'agarwal@ee.iitb.ac.in', '(+91 22) 25767124 (0)', 'Mumbai', '2015-01-01');
```

```
INSERT INTO works(prof_id, dept_id, duration_yrs)
```

```
VALUES
(1, 4, 5),
(2, 2, 4),
(3, 5, 3),
(4, 1, 6),
(5, 3, 3),
(6, 1, 5),
(7, 3, 7);
```

```
INSERT INTO shift(prof_id, shift, working_hours)
```

```
VALUES
(1, 'Morning', 8),
(2, 'Afternoon', 8),
(3, 'Morning', 8),
(4, 'Afternoon', 8),
```

```
(5, 'Morning', 8),  
(6, 'Afternoon', 5),  
(7, 'Afternoon', 5);
```

Queries:

```
-  
- Find the professor details and department details using NATURAL JOIN.  
SELECT prof_fname, prof_lname, dept_name  
FROM professors  
NATURAL JOIN departments;  
  
-- Find the prof_id, prof_name and shift. (INNER JOIN)  
SELECT professors.prof_id AS prof_id, CONCAT(prof_fname, ' ', prof_lname) AS prof_name, shift  
FROM professors  
INNER JOIN shift  
ON professors.prof_id = shift.prof_id;  
  
-  
- List all the department details and the corresponding names of professors in the same  
-- department.(left outer join)  
SELECT dept_name, CONCAT(prof_fname, ' ', prof_lname) AS prof_name  
FROM departments  
LEFT JOIN professors  
ON departments.dept_id = professors.dept_id;  
  
-  
- List all the professors and the corresponding names of department.(right outer join)  
SELECT CONCAT(prof_fname, ' ', prof_lname) AS prof_name, dept_name  
FROM professors  
RIGHT JOIN departments  
ON professors.dept_id = departments.dept_id;  
  
-  
- Display professor name, dept_name, shift, salary where prof_id = 101  
;(multitable join)  
SELECT CONCAT(prof_fname, ' ', prof_lname) AS prof_name, dept_name, shift, salary  
FROM professors  
INNER JOIN departments ON professors.dept_id = departments.dept_id  
INNER JOIN shift ON professors.prof_id = shift.prof_id;
```

```

-
- list the total number of professor in each department.(count and any
join,groupby)
SELECT departments.dept_name AS 'Department', COUNT(*) AS 'Available Pr
ofessors'
FROM professors
INNER JOIN departments ON professors.dept_id = departments.dept_id
GROUP BY departments.dept_id;

-
- List the prof_id associated department and the dept_name having name
'computer';(subquery)
SELECT prof_id, dept_id
FROM professors
WHERE professors.dept_id IN (SELECT dept_id FROM departments WHERE dept
_name='CSE');

-
- Find the names of all departments where the professors joined in year
2015 (or date of joining is 1-1-2015).(subquery)
SELECT dept_name
FROM departments
WHERE dept_id IN (SELECT dept_id FROM professors WHERE doj='2015-01-
01');

```

Tables:

```

mysql> SHOW TABLES
-> ;
+-----+
| Tables_in_a03_database |
+-----+
| departments             |
| professors              |
| shift                   |
| works                   |
+-----+
4 rows in set (0.01 sec)

```

Schema:

```
mysql> DESC professors;
```

Field	Type	Null	Key	Default	Extra
prof_id	int	NO	PRI	NULL	auto_increment
prof_fname	varchar(200)	YES		NULL	
prof_lname	varchar(200)	YES		NULL	
dept_id	int	NO	MUL	NULL	
designation	varchar(200)	YES		NULL	
salary	decimal(5,2)	YES		NULL	
doj	date	YES		NULL	
email	varchar(200)	YES		NULL	
phone	varchar(30)	YES		NULL	
city	varchar(100)	YES		NULL	

```
10 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM shift;
```

prof_id	shift	working_hours
1	Morning	8
2	Afternoon	8
3	Morning	8
4	Afternoon	8
5	Morning	8
6	Afternoon	5
7	Afternoon	5

```
7 rows in set (0.00 sec)
```

```
mysql> DESC shift;
```

Field	Type	Null	Key	Default	Extra
prof_id	int	NO	MUL	NULL	
shift	varchar(100)	YES		NULL	
working_hours	int	YES		NULL	

```
3 rows in set (0.00 sec)
```

```
mysql> DESC works;
```

Field	Type	Null	Key	Default	Extra
prof_id	int	NO	MUL	NULL	
dept_id	int	NO	MUL	NULL	
duration_yrs	int	NO		NULL	

```
3 rows in set (0.00 sec)
```

Tables Data:

```
mysql> SELECT * FROM departments;
```

dept_id	dept_name
1	CSE
2	Chem Eng.
3	EE
4	AE
5	Civil Eng.

5 rows in set (0.00 sec)

```
mysql> SELECT * FROM professors;
```

prof_id	prof_fname	prof_lname	dept_id	designation	salary	doj	email	phone	city
1	Sudarshan	Kumar	4	HOD	40.41	2010-08-01	head.aero@iitb.ac.in	(+91 22) 25767124 (O)	Mumbai
2	Madhu	Vinjamur	2	HOD	40.41	2008-09-01	head.chem@iitb.ac.in	(+91 22) 25767124 (O)	Mumbai
3	Deepankar	Choudhury	5	HOD	40.41	2001-01-01	head.civil@iitb.ac.in	(+91 22) 25767124 (O)	Mumbai
4	Umesh	Bellur	1	HOD	40.41	2009-08-01	head.cse@iitb.ac.in	(+91 22) 25767124 (O)	Mumbai
5	Kishore	Chatterjee	3	HOD	40.41	2005-03-01	head.ee@iitb.ac.in	(+91 22) 25767124 (O)	Mumbai
6	Vinay	Ribeiro	1	AP	30.31	2015-01-01	vinayr@cse.iitb.ac.in	(+91 22) 25767124 (O)	Mumbai
7	Vivek	Agarwal	3	Professor	35.41	2015-01-01	agarwal@ee.iitb.ac.in	(+91 22) 25767124 (O)	Mumbai

7 rows in set (0.00 sec)

```
mysql> SELECT * FROM shift;
```

prof_id	shift	working_hours
1	Morning	8
2	Afternoon	8
3	Morning	8
4	Afternoon	8
5	Morning	8
6	Afternoon	5
7	Afternoon	5

7 rows in set (0.00 sec)

```
mysql> SELECT * FROM works;
```

prof_id	dept_id	duration_yrs
1	4	5
2	2	4
3	5	3
4	1	6
5	3	3
6	1	5
7	3	7

7 rows in set (0.00 sec)

Queries:

```
mysql> -- Find the professor details and department details using NATURAL JOIN.
mysql> SELECT prof_fname, prof_lname, dept_name
      -> FROM professors
      -> NATURAL JOIN departments;
```

prof_fname	prof_lname	dept_name
Umesh	Bellur	CSE
Vinay	Ribeiro	CSE
Madhu	Vinjamur	Chem Eng.
Kishore	Chatterjee	EE
Vivek	Agarwal	EE
Sudarshan	Kumar	AE
Deepankar	Choudhury	Civil Eng.

7 rows in set (0.00 sec)

```
mysql>
mysql> -- Find the prof_id, prof_name and shift. (INNER JOIN)
mysql> SELECT professors.prof_id AS prof_id, CONCAT(prof_fname, ' ', prof_lname) AS prof_name, shift
      -> FROM professors
      -> INNER JOIN shift
      -> ON professors.prof_id = shift.prof_id;
```

prof_id	prof_name	shift
1	Sudarshan Kumar	Morning
2	Madhu Vinjamur	Afternoon
3	Deepankar Choudhury	Morning
4	Umesh Bellur	Afternoon
5	Kishore Chatterjee	Morning
6	Vinay Ribeiro	Afternoon
7	Vivek Agarwal	Afternoon

7 rows in set (0.00 sec)

```
mysql>
mysql> -- List all the department details and the corresponding names of professors in the same
mysql> -- department.(left outer join)
mysql> SELECT dept_name, CONCAT(prof_fname, ' ', prof_lname) AS prof_name
      -> FROM departments
      -> LEFT JOIN professors
      -> ON departments.dept_id = professors.dept_id;
```

dept_name	prof_name
CSE	Umesh Bellur
CSE	Vinay Ribeiro
Chem Eng.	Madhu Vinjamur
EE	Kishore Chatterjee
EE	Vivek Agarwal
AE	Sudarshan Kumar
Civil Eng.	Deepankar Choudhury

7 rows in set (0.00 sec)

```
mysql>
mysql> -- List all the professors and the corresponding names of department.(right outer join)
mysql> SELECT CONCAT(prof_fname, ' ', prof_lname) AS prof_name, dept_name
-> FROM professors
-> RIGHT JOIN departments
-> ON professors.dept_id = departments.dept_id;
```

prof_name	dept_name
Umesh Bellur	CSE
Vinay Ribeiro	CSE
Madhu Vinjamur	Chem Eng.
Kishore Chatterjee	EE
Vivek Agarwal	EE
Sudarshan Kumar	AE
Deepankar Choudhury	Civil Eng.

```
7 rows in set (0.00 sec)
```

```
mysql>
mysql> -- Display professor name, dept_name, shift, salary where prof_id = 101;(multitable join)
mysql> SELECT CONCAT(prof_fname, ' ', prof_lname) AS prof_name, dept_name, shift, salary
-> FROM professors
-> INNER JOIN departments ON professors.dept_id = departments.dept_id
-> INNER JOIN shift ON professors.prof_id = shift.prof_id;
```

prof_name	dept_name	shift	salary
Umesh Bellur	CSE	Afternoon	40.41
Vinay Ribeiro	CSE	Afternoon	30.31
Madhu Vinjamur	Chem Eng.	Afternoon	40.41
Kishore Chatterjee	EE	Morning	40.41
Vivek Agarwal	EE	Afternoon	35.41
Sudarshan Kumar	AE	Morning	40.41
Deepankar Choudhury	Civil Eng.	Morning	40.41

```
7 rows in set (0.00 sec)
```

```
mysql>
mysql> -- list the total number of professor in each department.(count and any join,groupby)
mysql> SELECT departments.dept_name AS 'Department', COUNT(*) AS 'Available Professors'
-> FROM professors
-> INNER JOIN departments ON professors.dept_id = departments.dept_id
-> GROUP BY departments.dept_id;
```

Department	Available Professors
CSE	2
Chem Eng.	1
EE	2
AE	1
Civil Eng.	1

```
5 rows in set (0.00 sec)
```



```
mysql>
mysql> -- List the prof_id associated department and the dept_name having name 'computer';(subquery)
mysql> SELECT prof_id, dept_id
  -> FROM professors
  -> WHERE professors.dept_id IN (SELECT dept_id FROM departments WHERE dept_name='CSE');
+-----+-----+
| prof_id | dept_id |
+-----+-----+
|      4 |      1 |
|      6 |      1 |
+-----+-----+
2 rows in set (0.00 sec)
```

```
mysql>
mysql> -- Find the names of all departments where the professors joined in year 2015 (or date of joining is 1-1-2015).(subquery)
mysql> SELECT dept_name
  -> FROM departments
  -> WHERE dept_id IN (SELECT dept_id FROM professors WHERE doj='2015-01-01');
+-----+
| dept_name |
+-----+
| CSE       |
| EE        |
+-----+
2 rows in set (0.00 sec)
```