Course Code: CSE 226
Course Title: Database Management System Lab

Database Lab report 1

[Submitted by]

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Problem title: Design database schema and populate the database with appropriate data set's.

Introduction: Database changes overtime as information is inserted and deleted. The collection of information is stored in database at a particular moment is called an record of the database. The overall design of database is called database schema's are changed in frequently if at all.

Problem statement: Database Schema for an Employee-Pay scenario (primary key columns are underlined)

employee (**emp_id: integer,** emp_name: string **NOT NULL**)
department (**dept_id: integer,** dept_name: string **NOT NULL**)
paydetails (**emp_id: integer, dept_id: integer,** basic: integer, deductions: integer, additions: integer, DOJ: date)
payroll(**pay_id: integer, emp_id: integer,** pay_date: date, paid_amount: integer)

For the above schema, perform the following-

1. Create the tables with the appropriate integrity constraints; insert around 10 records in each of the tables.
2. List all the employee names who joined after 1st January 2013.
3. List the individual amount paid to each employee on 1st of August 2016.
4. List the details of employees whose total salary is between $50,000 and $60,000.
5. Give a count of how many employees are working in each department.

Submitted query for condition no. 1:

Create employee table:

```
CREATE TABLE `employee`(
   emp_id          INT(5),
   emp_name        VARCHAR(30) NOT NULL,
   PRIMARY KEY(emp_id)
);
```

Insert data into the created table:

```
INSERT INTO `employee`(`emp_id`, `emp_name`) VALUES
('101', 'Fahim Kamal'),
('102', 'Sumaiya Sumi'),
('103', 'Ariful Islam'),
('104', 'Rafiul Islam'),
('105', 'Sirajul Islam'),
('106', 'Nurun Nahar'),
('107', 'Kamrun Nahar'),
('108', 'Monisha Moni'),
('109', 'Arizina Akter'),
('110', 'Ferdous Kamal')
```

Result:

emp_id	emp_name
101	Fahim Kamal
102	Sumaiya Sumi
103	Ariful Islam
104	Rafiul Islam
105	Sirajul Islam
106	Nurun Nahar
107	Kamrun Nahar
108	Monisha Moni
109	Arizina Akter
110	Ferdous Kamal

Create department table:

```
CREATE TABLE `department`(
   dept_id          INT(5),
   dept_name        VARCHAR(30) NOT NULL,
   PRIMARY KEY(dept_id)
);
```

Insert data into the created table:

```
INSERT INTO `department`(`dept_id`, `dept_name`) VALUES
('1101', 'Computer Science'),
('1102', 'electrical engineering'),
('1103', 'civil engineering'),
('1104', 'Laws'),
('1105', 'Business Administration'),
('1106', 'Management')
```

Result:

dept_id	dept_name
1101	Computer Science
1102	electrical engineering
1103	civil engineering
1104	Laws
1105	Business Administration
1106	Management

Create paydetails table:

```
CREATE TABLE `paydetails`(
   emp_id        INT(5),
   dept_id       INT(5),
   basic         INT(10),
   deductions    INT(10),
   additions     INT(10),
   DOJ           DATE,
   PRIMARY KEY(emp_id, dept_id),
   FOREIGN KEY(emp_id) REFERENCES `employee`(emp_id),
   FOREIGN KEY(dept_id) REFERENCES `department`(dept_id)
);
```

Insert data into the created table:

```
INSERT INTO `paydetails` (`emp_id`, `dept_id`, `basic`, `deductions`, `additions`, `DOJ`)
VALUES
('101', '1101', '55000', '1000', '3000', '2015-02-11'),
('102', '1101', '50000', '1000', '3000', '2015-08-16'),
('103', '1105', '40000', '1000', '2500', '2012-10-22'),
('104', '1105', '55000', '1500', '3500', '2014-10-06'),
('105', '1103', '54000', '1000', '3000', '2014-05-16'),
('106', '1105', '45000', '1200', '2000', '2015-11-24'),
('107', '1106', '40000', '800', '1700', '2016-01-25'),
('108', '1102', '47000', '1500', '1800', '2014-05-06'),
('109', '1104', '40000', '1000', '2200', '2015-04-19'),
('110', '1105', '56000', '1300', '3200', '2010-06-18');
```

Result:

emp_id	dept_id	basic	deductions	additions	DOJ
101	1101	55000	1000	3000	2015-02-11
102	1101	50000	1000	3000	2015-08-16
103	1105	40000	1000	2500	2012-10-22
104	1105	55000	1500	3500	2014-10-06
105	1103	54000	1000	3000	2014-05-16
106	1105	45000	1200	2000	2015-11-24
107	1106	40000	800	1700	2016-01-25
108	1102	47000	1500	1800	2014-05-06
109	1104	40000	1000	2200	2015-04-19
110	1105	56000	1300	3200	2010-06-18

Create **payroll** table:

```
CREATE TABLE `payroll`(
   pay_id          INT(5),
   emp_id          INT(5),
   pay_date        DATE,
   paid_amount     INT(10),
   PRIMARY KEY(pay_id),
   FOREIGN KEY(emp_id) REFERENCES `employee`(emp_id)
);
```

Insert data into the created table:

```
INSERT INTO `payroll` (`pay_id`, `emp_id`, `pay_date`, `paid_amount`) VALUES
('10101', '101', '2016-08-01', '51000'),
('10102', '102', '2016-08-01', '45000'),
('10103', '103', '2016-08-01', '47000'),
('10104', '104', '2016-08-01', '36000'),
('10105', '105', '2016-08-01', '57000'),
('10106', '106', '2016-08-01', '55000'),
('10107', '107', '2016-08-01', '47000'),
('10108', '108', '2016-08-01', '42000'),
('10109', '109', '2016-08-01', '51000'),
('10110', '110', '2016-08-01', '56000');
```

Result:

pay_id	emp_id	pay_date	paid_amount
10101	101	2016-08-01	51000
10102	102	2016-08-01	45000
10103	103	2016-08-01	47000
10104	104	2016-08-01	36000
10105	105	2016-08-01	57000
10106	106	2016-08-01	55000
10107	107	2016-08-01	47000
10108	108	2016-08-01	42000
10109	109	2016-08-01	51000
10110	110	2016-08-01	56000

Submitted query for condition no. 2:

List all the employee names who joined after 1st January 2013.

Query:

```
SELECT  emp_name, DOJ
FROM employee, paydetails
WHERE paydetails.DOJ >= '2013-01-01' and employee.emp_id = paydetails.emp_id
```

Result:

emp_name	DOJ
Fahim Kamal	2015-02-11
Sumaiya Sumi	2015-08-16
Rafiul Islam	2014-10-06
Sirajul Islam	2014-05-16
Kamrun Nahar	2016-01-25
Monisha Moni	2014-05-06
Arizina Akter	2015-04-19

Submitted query for condition no. 3:

List the individual amount paid to each employee on 1st of August 2016

Query:

```
SELECT DISTINCT
   employee.emp_name,
   payroll.pay_date,
   payroll.paid_amount
FROM
   employee,
   payroll
WHERE
   payroll.pay_date = '2016-08-01' AND employee.emp_id = payroll.emp_id
```

Result:

emp_name	pay_date	paid_amount
Fahim Kamal	2016-08-01	51000
Sumaiya Sumi	2016-08-01	45000
Ariful Islam	2016-08-01	47000
Rafiul Islam	2016-08-01	36000
Sirajul Islam	2016-08-01	57000
Nurun Nahar	2016-08-01	55000
Kamrun Nahar	2016-08-01	47000
Monisha Moni	2016-08-01	42000
Arizina Akter	2016-08-01	51000
Ferdous Kamal	2016-08-01	56000

Submitted query for condition no. 4:

List the details of employees whose total salary is between $50,000 and $60,000.

Query:

```
SELECT
   employee.emp_id,
   employee.emp_name,
   ((paydetails.basic + paydetails.additions)-paydetails.deductions) AS total_salary
FROM
   employee,
   paydetails
WHERE
   employee.emp_id = paydetails.emp_id AND(
        ((paydetails.basic + paydetails.additions)-paydetails.deductions) BETWEEN 50000 AND
60000
   )
```

Result:

emp_id	emp_name	total_salary
101	Fahim Kamal	57000
102	Sumaiya Sumi	52000
104	Rafiul Islam	57000
105	Sirajul Islam	56000
110	Ferdous Kamal	57900

Submitted query for condition no. 5:

Give a count of how many employees are working in each department.

Query:

```
SELECT
   department.dept_name,
   COUNT(paydetails.dept_id) AS emp_no
FROM
   department,
   paydetails
WHERE
   department.dept_id = paydetails.dept_id
GROUP BY
   department.dept_name
```

Result:

dept_name	emp_no
Business Administration	4
civil engineering	1
Computer Science	2
electrical engineering	1
Laws	1
Management	1

Conclusion: A database management system is really important because it manages data efficiently and allows users to perform multiple tasks with ease. A database management system stores, organizes and manages a large amount of information within a single software application. Use of this system increases efficiency of business operations and reduces overall costs.