**SPECIAL FORCE : ASSIGNMENT 1**

**---------------------------------------------------------------------------------------------------------------------------**

**CREATE DATABASE specialforce;**

**mysql> USE specialforce;**

**Database changed**

**mysql> CREATE TABLE Departments (**

**department\_id INT PRIMARY KEY,**

**department\_name VARCHAR(50) NOT NULL**

**);**

**CREATE TABLE Employee (**

**employee\_id INT PRIMARY KEY,**

**first\_name VARCHAR(50) NOT NULL,**

**last\_name VARCHAR(50) NOT NULL,**

**email VARCHAR(100) UNIQUE,**

**hire\_date DATETIME NOT NULL,**

**salary DECIMAL(10,2) NOT NULL,**

**department\_id INT,**

**FOREIGN KEY (department\_id) REFERENCES Departments(department\_id)**

**);**

**CREATE TABLE Projects (**

**project\_id INT PRIMARY KEY,**

**project\_name VARCHAR(100) NOT NULL,**

**start\_date DATETIME NOT NULL,**

**end\_date DATETIME,**

**department\_id INT,**

**FOREIGN KEY (department\_id) REFERENCES Departments(department\_id)**

**);**

**INSERT INTO Departments (department\_id, department\_name) VALUES**

**(1, 'IT'),**

**(2, 'HR'),**

**(3, 'Sales'),**

**(4, 'Finance'),**

**(5, 'Marketing');**

**INSERT INTO Employees (employee\_id, first\_name, last\_name, email, hire\_date, salary,**

**department\_id) VALUES**

**(101, 'Ravi', 'Sharma', 'ravi.sharma@specialforce.com', '2017-05-15 ', 55000.00, 1),**

**(102, 'Neha', 'Kapoor', 'neha.kapoor@specialforce.com', '2019-03-23 ', 48000.00, 2),**

**(103, 'Jyoti', 'Verma', 'jyoti.verma@specialforce.com', '2020-11-02 ', 60000.00, 1),**

**(104, 'Anil', 'Patil', 'anil.patil@specialforce.com', '2018-09-18 ', 70000.00, 3),**

**(105, 'Pooja', 'Singh', 'pooja.singh@specialforce.com', '2021-06-10', 40000.00, 4),**

**(106, 'Sanjay', 'Iyer', 'sanjay.iyer@specialforce.com', '2018-01-22 ', 75000.00, 3),**

**(107, 'Jatin', 'Reddy', 'jatin.reddy@specialforce.com', '2021-12-12 ', 85000.00, 2),**

**(108, 'Shreya', 'Mehta', 'shreya.mehta@specialforce.com', '2022-04-19 ', 30000.00, 5),**

**(109, 'Rajesh', 'Gupta', 'rajesh.gupta@specialforce.com', '2020-08-11 ', 90000.00, 1),**

**(110, 'Kavita', 'Nair', 'kavita.nair@specialforce.com', '2021-02-07 ', 50000.00, 2);**

**INSERT INTO Projects (project\_id, project\_name, start\_date, end\_date, department\_id) VALUES**

**(201, 'Project Phoenix', '2021-01-15 ', '2022-07-30 00:00:00', 1),**

**(202, 'Client Onboarding', '2020-06-20 ', NULL, 3),**

**(203, 'Financial Overhaul', '2019-03-10 ', '2021-12-15 00:00:00', 4),**

**(204, 'Marketing Revamp', '2022-03-01 ', NULL, 5),**

**(205, 'Internal System Audit', '2023-02-15 ', NULL, 2);**

**SELECT \* FROM Departments;**

**+---------------+-----------------+**

**| department\_id | department\_name |**

**+---------------+-----------------+**

**| 1 | IT |**

**| 2 | HR |**

**| 3 | Sales |**

**| 4 | Finance |**

**| 5 | Marketing |**

**+---------------+-----------------+**

**| employee\_id | first\_name | last\_name | email | hire\_date | salary | department\_id |**

**+-------------+------------+-----------+-------------------------------+------------+----------+---------------+**

**| 101 | Ravi | Sharma | ravi.sharma@specialforce.com | 2017-05-15 | 55000.00 | 1 |**

**| 102 | Neha | Kapoor | neha.kapoor@specialforce.com | 2019-03-23 | 48000.00 | 2 |**

**| 103 | Jyoti | Verma | jyoti.verma@specialforce.com | 2020-11-02 | 60000.00 | 1 |**

**| 104 | Anil | Patil | anil.patil@specialforce.com | 2018-09-18 | 70000.00 | 3 |**

**| 105 | Pooja | Singh | pooja.singh@specialforce.com | 2021-06-10 | 40000.00 | 4 |**

**| 106 | Sanjay | Iyer | sanjay.iyer@specialforce.com | 2018-01-22 | 75000.00 | 3 |**

**| 107 | Jatin | Reddy | jatin.reddy@specialforce.com | 2021-12-12 | 85000.00 | 2 |**

**| 108 | Shreya | Mehta | shreya.mehta@specialforce.com | 2022-04-19 | 30000.00 | 5 |**

**| 109 | Rajesh | Gupta | rajesh.gupta@specialforce.com | 2020-08-11 | 90000.00 | 1 |**

**| 110 | Kavita | Nair | kavita.nair@specialforce.com | 2021-02-07 | 50000.00 | 2 |**

**+-------------+------------+-----------+-------------------------------+------------+----------+---------------+**

**SELECT \* FROM Projects;**

**+------------+-----------------------+------------+------------+---------------+**

**| project\_id | project\_name | start\_date | end\_date | department\_id |**

**+------------+-----------------------+------------+------------+---------------+**

**| 201 | Project Phoenix | 2021-01-15 | 2022-07-30 | 1 |**

**| 202 | Client Onboarding | 2020-06-20 | NULL | 3 |**

**| 203 | Financial Overhaul | 2019-03-10 | 2021-12-15 | 4 |**

**| 204 | Marketing Revamp | 2022-03-01 | NULL | 5 |**

**| 205 | Internal System Audit | 2023-02-15 | NULL | 2 |**

**+------------+-----------------------+------------+------------+---------------+**

**Query 1: Write a query to retrieve the first name, last name, and department name of all**

**employees. If an employee does not belong to any department, the department name should be null .**

**select e.first\_name, e.last\_name, department\_name from employee e,departments where e.department\_id = departments.department\_id;**

**+------------+-----------+-----------------+**

**| first\_name | last\_name | department\_name |**

**+------------+-----------+-----------------+**

**| Ravi | Sharma | IT |**

**| Neha | Kapoor | HR |**

**| Jyoti | Verma | IT |**

**| Anil | Patil | Sales |**

**| Pooja | Singh | Finance |**

**| Sanjay | Iyer | Sales |**

**| Jatin | Reddy | HR |**

**| Shreya | Mehta | Marketing |**

**| Rajesh | Gupta | IT |**

**| Kavita | Nair | HR |**

**+------------+-----------+-----------------+**

**Query 2: Find all employees in IT department earning > ₹50,000**

**select \* from employee where salary > 50000 and department\_id =(select department\_id from departments where department\_name='IT');**

**+-------------+------------+-----------+-------------------------------+------------+----------+---------------+**

**| employee\_id | first\_name | last\_name | email | hire\_date | salary | department\_id |**

**+-------------+------------+-----------+-------------------------------+------------+----------+---------------+**

**| 101 | Ravi | Sharma | ravi.sharma@specialforce.com | 2017-05-15 | 55000.00 | 1 |**

**| 103 | Jyoti | Verma | jyoti.verma@specialforce.com | 2020-11-02 | 60000.00 | 1 |**

**| 109 | Rajesh | Gupta | rajesh.gupta@specialforce.com | 2020-08-11 | 90000.00 | 1 |**

**Query 3: Write a query to list the first name, last name, and email of all employees whose first**

**name starts with 'J' and whose email contains specialforce.com.**

**select first\_name, last\_name, email from employee where First\_name like 'J%'and email like '%specialforce.com';**

**+------------+-----------+------------------------------+**

**| first\_name | last\_name | email |**

**+------------+-----------+------------------------------+**

**| Jyoti | Verma | jyoti.verma@specialforce.com |**

**| Jatin | Reddy | jatin.reddy@specialforce.com |**

**+------------+-----------+------------------------------+**

**Query 4: Write a query to find all the distinct department names in the Departments table.**

**select distinct department\_name from departments;**

**+-----------------+**

**| department\_name |**

**+-----------------+**

**| IT |**

**| HR |**

**| Sales |**

**| Finance |**

**| Marketing |**

**+-----------------+**

**Query 5: Write a query to calculate the total salary expenditure of each department.**

**select department\_name, sum(salary) from departments,employee where employee.department\_id= departments.department\_id group by department\_name;**

**+-----------------+-------------+**

**| department\_name | sum(salary) |**

**+-----------------+-------------+**

**| IT | 205000.00 |**

**| HR | 183000.00 |**

**| Sales | 145000.00 |**

**| Finance | 40000.00 |**

**| Marketing | 30000.00 |**

**+-----------------+-------------+**

**Query 6: Write a query to find the average salary of employees in the Finance department.**

**select avg(salary) from employee where department\_id = (select department\_id from departments where department\_name ='Finance');**

**+--------------+**

**| avg(salary) |**

**+--------------+**

**| 40000.000000 |**

**+--------------+1**

**Query 7: Write a query to find the minimum and maximum salaries of employees in the Sales department.**

**select max(salary) from employee where department\_id = (select department\_id from departments where department\_name = 'sales');**

**+-------------+**

**| max(salary) |**

**+-------------+**

**| 75000.00 |**

**+-------------+**

**Query 8: Write a query to count the number of employees in each department.**

select departments.department\_name, count(\*) count\_of\_employee from employee, departments where departments.department\_id = employee.department\_id group by departments.department\_name;

+-----------------+-------------------+

| department\_name | count\_of\_employee |

+-----------------+-------------------+

| IT | 3 |

| HR | 3 |

| Sales | 2 |

| Finance | 1 |

| Marketing | 1 |

+-----------------+-------------------+

**Query 9: Write a query to find all employees who were hired between January 1, 2018, and**

**December 31, 2020. Sort the result by hire date in ascending order.**

select \* from employee where hire\_date between '2018-01-01' and '2020-12-31' order by hire\_date;

+-------------+------------+-----------+-------------------------------+------------+--------+---------------+

| Employee\_id | First\_name | Last\_name | email | hire\_date | salary | department\_id |

+-------------+------------+-----------+-------------------------------+------------+--------+---------------+

| 106 | Sanjay | Iyer | sanjay.iyer@specialforce.com | 2018-01-22 | 75000 | 3 |

| 104 | Anil | Patil | anil.patil@specialforce.com | 2018-09-18 | 70000 | 3 |

| 102 | Neha | Kapoor | neha.kapoor@specialforce.com | 2019-03-23 | 48000 | 2 |

| 109 | Rajesh | Gupta | rajesh.gupta@specialforce.com | 2020-08-11 | 90000 | 1 |

| 103 | Jyoti | Verma | jyoti.verma@specialforce.com | 2020-11-02 | 60000 | 1 |

**Query 10: Write a query to list all employees who do not have an email address.**

select \* from employee where email is null;

**Query 11: Write a query to find all employees who work in HR, Finance, or IT departments.**

select \* from employee where department\_id in (select department\_id from departments where department\_name in ('HR','Finance','IT'));

+-------------+------------+-----------+-------------------------------+------------+--------+---------------+

| Employee\_id | First\_name | Last\_name | email | hire\_date | salary | department\_id |

+-------------+------------+-----------+-------------------------------+------------+--------+---------------+

| 101 | Ravi | Sharma | ravi.sharma@specialforce.com | 2017-05-15 | 55000 | 1 |

| 103 | Jyoti | Verma | jyoti.verma@specialforce.com | 2020-11-02 | 60000 | 1 |

| 109 | Rajesh | Gupta | rajesh.gupta@specialforce.com | 2020-08-11 | 90000 | 1 |

| 102 | Neha | Kapoor | neha.kapoor@specialforce.com | 2019-03-23 | 48000 | 2 |

| 107 | Jatin | Reddy | jatin.reddy@specialforce.com | 2021-12-12 | 85000 | 2 |

| 110 | Kavita | Nair | kavita.nair@specialforce.com | 2021-02-07 | 50000 | 2 |

| 105 | Pooja | Singh | pooja.singh@specialforce.com | 2021-06-10 | 40000 | 4 |

+-------------+------------+-----------+-------------------------------+------------+------+

**Query 12: Write a query to list the first name, last name, and salary of employees earning**

**between ₹30,000 and ₹70,000. Sort the results by salary in descending order.**

select first\_name, Last\_name, salary from employee where salary between 30000 and 70000;

+------------+-----------+--------+

| first\_name | Last\_name | salary |

+------------+-----------+--------+

| Ravi | Sharma | 55000 |

| Neha | Kapoor | 48000 |

| Jyoti | Verma | 60000 |

| Anil | Patil | 70000 |

| Pooja | Singh | 40000 |

| Shreya | Mehta | 30000 |

| Kavita | Nair | 50000 |

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**Transaction Management Tasks:**

Use transaction control statements to manage the salary updates as follows:

**Task 1: Increase HR Salaries:**

**Write a query to increase the salaries of all employees in the HR department by 5%. Start a transaction before applying the changes.**

update employee set salary = salary\*1.05 where department\_id = (select department\_id from departments where department\_name = 'HR');

**select \* from employee;**

+-------------+------------+-----------+-------------------------------+------------+--------+---------------+

| Employee\_id | First\_name | Last\_name | email | hire\_date | salary | department\_id |

+-------------+------------+-----------+-------------------------------+------------+--------+---------------+

| 101 | Ravi | Sharma | ravi.sharma@specialforce.com | 2017-05-15 | 55000 | 1 |

| 102 | Neha | Kapoor | neha.kapoor@specialforce.com | 2019-03-23 | 50400 | 2 |

| 103 | Jyoti | Verma | jyoti.verma@specialforce.com | 2020-11-02 | 60000 | 1 |

| 104 | Anil | Patil | anil.patil@specialforce.com | 2018-09-18 | 70000 | 3 |

| 105 | Pooja | Singh | pooja.singh@specialforce.com | 2021-06-10 | 40000 | 4 |

| 106 | Sanjay | Iyer | sanjay.iyer@specialforce.com | 2018-01-22 | 75000 | 3 |

| 107 | Jatin | Reddy | jatin.reddy@specialforce.com | 2021-12-12 | 89250 | 2 |

| 108 | Shreya | Mehta | shreya.mehta@specialforce.com | 2022-04-19 | 30000 | 5 |

| 109 | Rajesh | Gupta | rajesh.gupta@specialforce.com | 2020-08-11 | 90000 | 1 |

| 110 | Kavita | Nair | kavita.nair@specialforce.com | 2021-02-07 | 52500 | 2 |

**Task 2: Savepoint Before Sales Increase:**

**Set a savepoint before increasing the salaries of employees in the Sales department by 3%.**

start transaction;

Query OK, 0 rows affected (0.00 sec)

savepoint before1;

Query OK, 0 rows affected (0.00 sec)

**mysql> update employee set salary = salary\*1.03 where department\_id = (select department\_id from departments where department\_name = 'Sales');**

Query OK, 2 rows affected (0.03 sec)

Rows matched: 2 Changed: 2 Warnings: 0

**mysql> select \* from employee;**

+-------------+------------+-----------+-------------------------------+------------+--------+---------------+

| Employee\_id | First\_name | Last\_name | email | hire\_date | salary | department\_id |

+-------------+------------+-----------+-------------------------------+------------+--------+---------------+

| 101 | Ravi | Sharma | ravi.sharma@specialforce.com | 2017-05-15 | 55000 | 1 |

| 102 | Neha | Kapoor | neha.kapoor@specialforce.com | 2019-03-23 | 50400 | 2 |

| 103 | Jyoti | Verma | jyoti.verma@specialforce.com | 2020-11-02 | 60000 | 1 |

| 104 | Anil | Patil | anil.patil@specialforce.com | 2018-09-18 | 72100 | 3 |

| 105 | Pooja | Singh | pooja.singh@specialforce.com | 2021-06-10 | 40000 | 4 |

| 106 | Sanjay | Iyer | sanjay.iyer@specialforce.com | 2018-01-22 | 77250 | 3 |

| 107 | Jatin | Reddy | jatin.reddy@specialforce.com | 2021-12-12 | 89250 | 2 |

| 108 | Shreya | Mehta | shreya.mehta@specialforce.com | 2022-04-19 | 30000 | 5 |

| 109 | Rajesh | Gupta | rajesh.gupta@specialforce.com | 2020-08-11 | 90000 | 1 |

| 110 | Kavita | Nair | kavita.nair@specialforce.com | 2021-02-07 | 52500 | 2 |

+-------------+------------+-----------+-------------------------------+------------+--------+---------------+

mysql> **ROLLBACK TO SAVEPOINT before1;**

mysql> **select \* from employee;**

**+-------------+------------+-----------+-------------------------------+------------+--------+---------------+**

**| Employee\_id | First\_name | Last\_name | email | hire\_date | salary | department\_id |**

**+-------------+------------+-----------+-------------------------------+------------+--------+---------------+**

**| 101 | Ravi | Sharma | ravi.sharma@specialforce.com | 2017-05-15 | 55000 | 1 |**

**| 102 | Neha | Kapoor | neha.kapoor@specialforce.com | 2019-03-23 | 50400 | 2 |**

**| 103 | Jyoti | Verma | jyoti.verma@specialforce.com | 2020-11-02 | 60000 | 1 |**

**| 104 | Anil | Patil | anil.patil@specialforce.com | 2018-09-18 | 70000 | 3 |**

**| 105 | Pooja | Singh | pooja.singh@specialforce.com | 2021-06-10 | 40000 | 4 |**

**| 106 | Sanjay | Iyer | sanjay.iyer@specialforce.com | 2018-01-22 | 75000 | 3 |**

**| 107 | Jatin | Reddy | jatin.reddy@specialforce.com | 2021-12-12 | 89250 | 2 |**

**| 108 | Shreya | Mehta | shreya.mehta@specialforce.com | 2022-04-19 | 30000 | 5 |**

**| 109 | Rajesh | Gupta | rajesh.gupta@specialforce.com | 2020-08-11 | 90000 | 1 |**

**| 110 | Kavita | Nair | kavita.nair@specialforce.com | 2021-02-07 | 52500 | 2 |**

**+-------------+------------+-----------+-------------------------------+------------+--------+---------------+**

**Task 3: Rollback Sales Salary Increase:**

Rollback to the savepoint created . before the Sales salary increase

**ROLLBACK TO SAVEPOINT before1;**

**Task 4: Commit the Transaction:**

After rolling back the Sales increase, commit the changes made to the HR department salaries.

COMMIT;

**Query 13:** **Write a query to join the Employees and Departments tables to list employees and their department names. Make sure all employees are included, even if they don’t belong to any department.**

mysql> select first\_name, last\_name, department\_name from employee,departments where

employee.department\_id = departments.department\_id;

+------------+-----------+-----------------+

| first\_name | last\_name | department\_name |

+------------+-----------+-----------------+

| Ravi | Sharma | IT |

| Jyoti | Verma | IT |

| Rajesh | Gupta | IT |

| Neha | Kapoor | HR |

| Jatin | Reddy | HR |

| Kavita | Nair | HR |

| Anil | Patil | Sales |

| Sanjay | Iyer | Sales |

| Pooja | Singh | Finance |

| Shreya | Mehta | Marketing |

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**Query 14:** **Write a query to list employees who are working on projects that started after January 1, 2023.**

**select \* from employee where department\_id = (select department\_id from projects where start\_date > '2023-01-01');**

+-------------+------------+-----------+------------------------------+------------+--------+---------------+

| Employee\_id | First\_name | Last\_name | email | hire\_date | salary | department\_id |

+-------------+------------+-----------+------------------------------+------------+--------+---------------+

| 102 | Neha | Kapoor | neha.kapoor@specialforce.com | 2019-03-23 | 50400 | 2 |

| 107 | Jatin | Reddy | jatin.reddy@specialforce.com | 2021-12-12 | 89250 | 2 |

| 110 | Kavita | Nair | kavita.nair@specialforce.com | 2021-02-07 | 52500 | 2 |

+-------------+------------+-----------+------------------------------+------------+--------+---------------+

**Query 15:** **Write a query to list all departments, even those without any employees assigned.**

**select d.department\_id, d.department\_name, e.employee\_id, e.first\_name from departments d left join employee e on d.department\_id = e.department\_id;**

----+-----------------+-------------+------------+

| department\_id | department\_name | employee\_id | first\_name |

+---------------+-----------------+-------------+------------+

| 1 | IT | 101 | Ravi |

| 1 | IT | 103 | Jyoti |

| 1 | IT | 109 | Rajesh |

| 2 | HR | 102 | Neha |

| 2 | HR | 107 | Jatin |

| 2 | HR | 110 | Kavita |

| 3 | Sales | 104 | Anil |

| 3 | Sales | 106 | Sanjay |

| 4 | Finance | 105 | Pooja |

| 5 | Marketing | 108 | Shreya |

+---------------+-----------------+-------------+------------+

**Query 16:** **Write a query to find the employee with the highest salary in each department.**

**SELECT e.employee\_id, e.first\_name, e.salary, e.department\_id FROM employee e WHERE salary = (SELECT MAX(salary) FROM employee WHERE department\_id = e.department\_id);**

+-------------+------------+--------+---------------+

| employee\_id | first\_name | salary | department\_id |

+-------------+------------+--------+---------------+

| 105 | Pooja | 40000 | 4 |

| 106 | Sanjay | 75000 | 3 |

| 107 | Jatin | 89250 | 2 |

| 108 | Shreya | 30000 | 5 |

| 109 | Rajesh | 90000 | 1 |

+-------------+------------+--------+---------------+

**Query 17:** Write a query to remove all data from the Employees table but keep the structure intact.

**mysql>** **TRUNCATE TABLE Employees;**

**Query 18:** Write a query to drop the Projects table from the database.

**mysql>** **drop table projects;**

**Query 19:** SpecialForce Private Limited realized they need to store the phone numbers of employees. Write a query to add a new column phone\_number (VARCHAR(15)) to the Employees table using the ALTER statement.

**mysql>alter table employee add column Phone\_number varchar(15);**

**Query 20:** The company also decided to track the budget for each project. Write a query to add a column budget (DECIMAL(10,2)) to the Projects table.

**mysql>** alter table projects add column budget DECIMAL(10,2) ;

**Query 21:** Write a query to find the 2nd largest salary from the Employees table using:

 A **subquery**.

**mysql>** select max(salary) from employee where salary <(select max(salary) from employee);

+-------------+

| max(salary) |

+-------------+

| 89250 |

+-------------+

 The LIMIT clause.

**mysql>** select salary from employee order by salary desc limit 1 offset 1;

+--------+

| salary |

+--------+

| 89250 |

+--------+

**Query 22:** Write a query to find the 3rd largest salary from the Employees table using:

 A **subquery**.

**mysql>** select max(salary) from employee where salary <(select max(salary) from employee where salary < (select Max(salary) from employee));

+-------------+

| max(salary) |

+-------------+

| 75000 |

The LIMIT clause.

**mysql>** select salary from employee order by salary desc limit 1 offset 2;

+--------+

| salary |

+--------+

| 75000 |

+--------+



**Query 23:** Write a query to drop the Projects table.

**mysql>** drop table projects;

**Query 24:** Write a query to truncate the Employees table

**mysql>** TRUNCATE TABLE Employees;