Assignment -

Theory

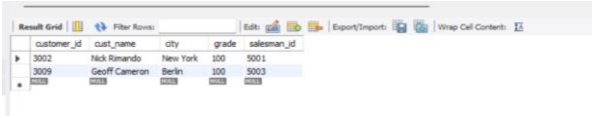
1.compare sql and nosql databases.

Aspect	SQL (Relational)	NoSQL (Non-relational)
Data Structure	Tables with rows and columns	Document-based, key-value, column-family, or graph-based
Schema	Fixed schema (predefined structure)	Flexible schema (dynamic and adaptable)
Scalability	Vertically scalable (upgrading hardware)	Horizontally scalable (adding more servers)
Data Integrity	ACID-compliant (strong consistency)	BASE-compliant (more available, less consistent)
Query Language	SQL (Structured Query Language)	Varies (e.g., MongoDB uses its own query language)
Performance	Efficient for complex queries and transactions	Better for large-scale data and fast read/write operations
Use Case	Best for transactional systems (banking, ERP, etc.)	Ideal for big data, real-time web apps, and data lakes
Examples	MySQL, PostgreSQL, Oracle, MS SQL Server	MongoDB, Cassandra, CouchDB, Neo4j

Practical-

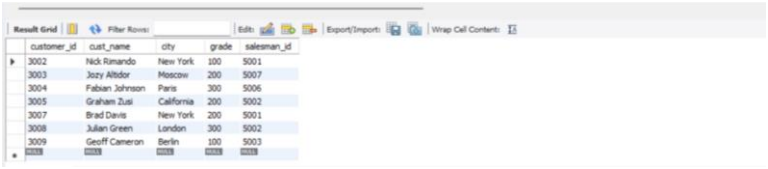
1. Write a SQL query to find customers who are either from the city 'New York' or who do not have a grade greater than 100. Return customer_id, cust_name, city, grade, and salesman_id.

```
select customer_id,cust_name,city,grade,salesman_id
from customer
where city = 'new york' or grade <= 100 or grade;
```



2. Write a SQL query to find all the customers in 'New York' city who have a grade value above 100. Return customer_id, cust_name, city, grade, and salesman_id.

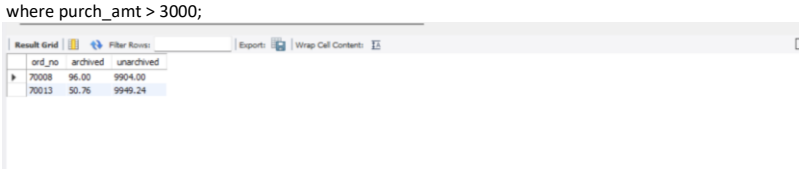
```
select customer_id, cust_name, city, grade,  salesman_id
from customer
where city = 'new york' or grade >= 100;
```



customer_id	cust_name	city	grade	salesman_id
3002	Nick Rimando	New York	100	5001
3003	Jozy Altidor	Moscow	200	5007
3004	Fabian Johnson	Paris	300	5006
3005	Graham Zusi	California	200	5002
3007	Brad Davis	New York	200	5001
3008	Julian Green	London	300	5002
3009	Geoff Cameron	Berlin	100	5003

3. Write a SQL query that displays order number, purchase amount, and the achieved and unachieved percentage (%) for those orders that exceed 50% of the target value of 6000.

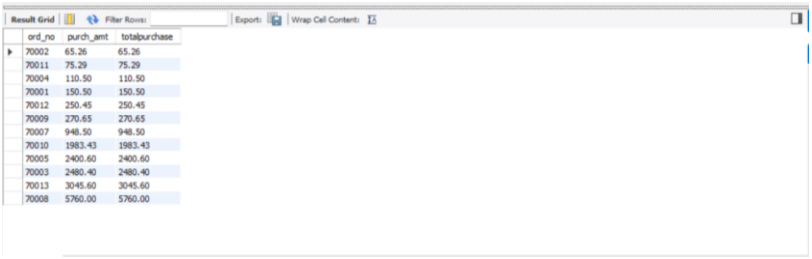
```
select ord_no, round((purch_amt /6000)*100,2) as archived, round((100-purch_amt /6000)*100,2) as unarchived
from orders
where purch_amt > 3000;
```



ord_no	archived	unarchived
70008	96.00	9904.00
70013	50.76	9949.24

4. Write a SQL query to calculate the total purchase amount of all orders. Return total purchase amount.

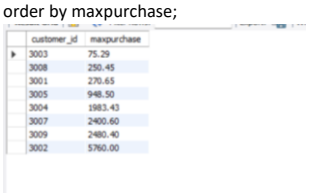
```
select ord_no,purch_amt, sum(purch_amt) as totalpurchase
from orders
group by ord_no,purch_amt
order by totalpurchase;
```



ord_no	purch_amt	totalpurchase
70002	65.26	65.26
70011	75.29	75.29
70004	110.50	110.50
70001	150.50	150.50
70012	250.45	250.45
70009	270.65	270.65
70007	948.50	948.50
70010	1983.43	1983.43
70005	2400.60	2400.60
70003	2480.40	2480.40
70013	3045.60	3045.60
70008	5760.00	5760.00

5.Write a SQL query to find the highest purchase amount ordered by each customer. Return customer_id, maximum purchase amount.

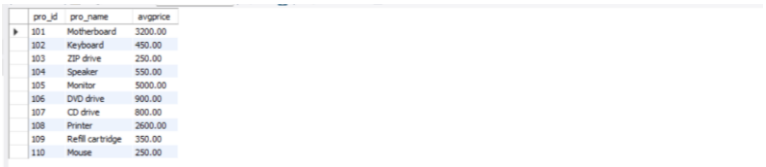
```
select customer_id,max(purch_amt) as maxpurchase
from orders
group by customer_id
order by maxpurchase;
```



customer_id	maxpurchase
3003	75.29
3008	250.45
3001	270.65
3005	948.50
3004	1983.43
3007	2400.60
3009	2480.40
3002	5760.00

6.Write a SQL query to calculate the average product price. Return average product price.

```
select pro_id,pro_name,round(avg(pro_price),2) as avgprice
from item_mast
group by pro_id,pro_name;
```



pro_id	pro_name	avgprice
101	Motherboard	3200.00
102	Keyboard	450.00
103	ZIP drive	250.00
104	Speaker	550.00
105	Monitor	5000.00
106	DVD drive	900.00
107	CD drive	800.00
108	Printer	2600.00
109	Refill cartridge	350.00
110	Mouse	250.00

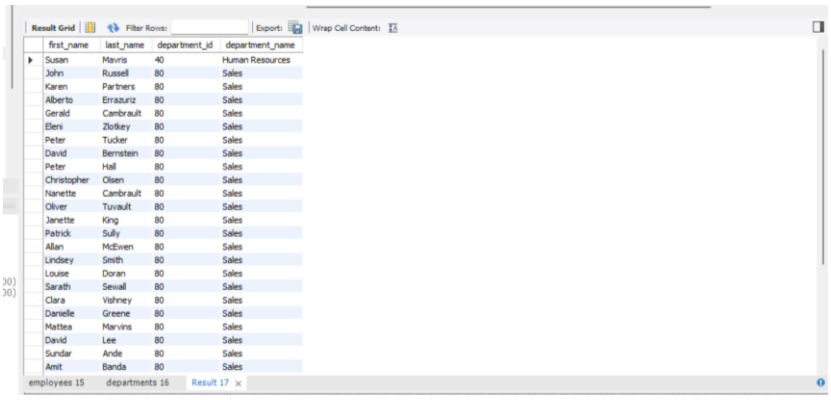
7. Write a SQL query to find those employees whose department is located at ‘Toronto’. Return first name, last name, employee_id, job_id.

```
SELECT e.employee_id,e.first_name,e.last_name,e.job_id
FROM employees e
join departments d
on e.department_id = d.department_id
join locations l
on d.location_id = l.location_id
where l.city='toronto';
```

employee_id	first_name	last_name	job_id
201	Michael	Hartstein	MK_MAN
202	Pat	Fay	MK_REP

8. Write a SQL query to find those employees whose salary is lower than that of employees whose job title is"MK_MAN". Exclude employees of the job title "MK_MAN". Return employee_id, first name, last name, job_id.

```
select employee_id,first_name,last_name,job_id
from employees
where salary <
   (select max(salary) lowersalary
   from employees
   where job_id = 'MK_MAN')
and job_id != 'MK_MAN';
```



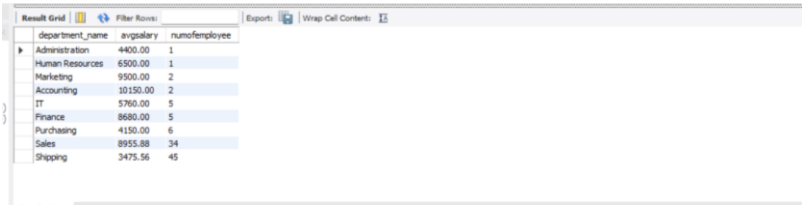
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

first_name	last_name	department_id	department_name
Susan	Mavris	40	Human Resources
John	Russell	80	Sales
Karen	Partners	80	Sales
Alberto	Errazuriz	80	Sales
Gerald	Cambrault	80	Sales
Eleni	Zlotkey	80	Sales
Peter	Tucker	80	Sales
David	Bernstein	80	Sales
Peter	Hall	80	Sales
Christopher	Olsen	80	Sales
Nanette	Cambrault	80	Sales
Oliver	Tuvault	80	Sales
Janette	King	80	Sales
Patrick	Sully	80	Sales
Allan	McEwen	80	Sales
Lindsey	Smith	80	Sales
Louise	Doran	80	Sales
Sarath	Sewall	80	Sales
Clara	Vishney	80	Sales
Danielle	Greene	80	Sales
Mattea	Marvins	80	Sales
David	Lee	80	Sales
Sundar	Ande	80	Sales
Amit	Banda	80	Sales

employees 15 | departments 16 | Result 17

10. Write a SQL query to calculate the average salary, the number of employees receiving commissions in that department. Return department name, average salary and number of employees.

```
select d.department_name , round(avg(e.salary),2) avgsalary ,count(*) numofemployee
from employees e
join departments d
on e.department_id = d.department_id
group by d.department_name
order by numofemployee;
```

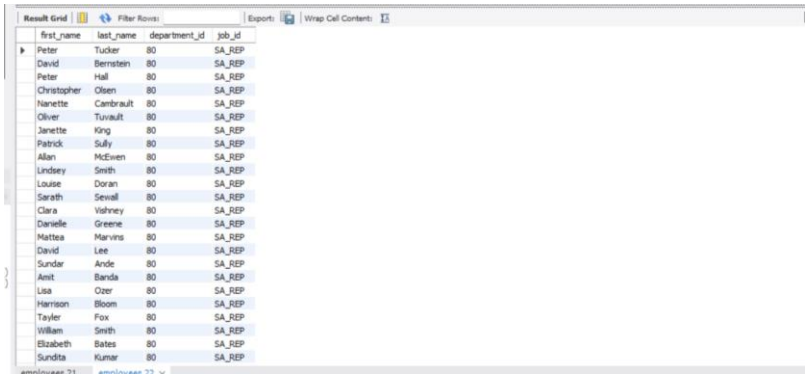


Result Grid | Filter Rows: | Export: | Wrap Cell Content:

department_name	avgsalary	numofemployee
Administration	4400.00	1
Human Resources	6500.00	1
Marketing	9500.00	2
Accounting	10150.00	2
IT	5760.00	5
Finance	8680.00	5
Purchasing	4150.00	6
Sales	8955.88	34
Shipping	3475.56	45

11. Write a SQL query to find out which employees have the same designation as the employee whose ID is 169. Return first name, last name, department ID, and job ID.

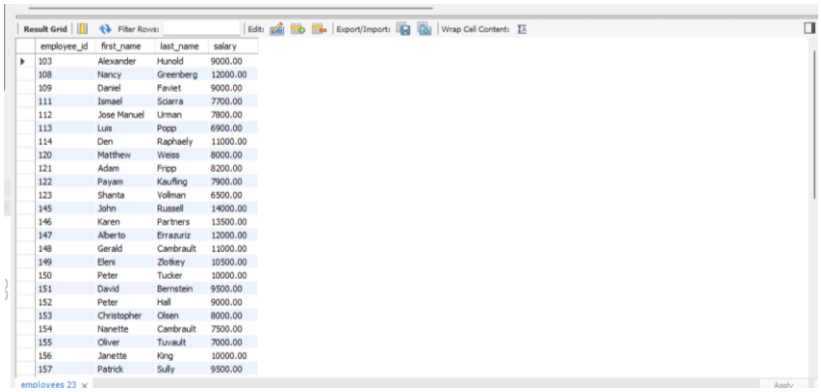
```
select*from employees;
select first_name,last_name,department_id,job_id
from employees
where job_id = (
        select job_id
        from employees
        where employee_id = 169);
```



first_name	last_name	department_id	job_id
Peter	Tucker	80	SA_REP
David	Bernstein	80	SA_REP
Peter	Hall	80	SA_REP
Christopher	Olsen	80	SA_REP
Nanette	Cambrault	80	SA_REP
Oliver	Tuvault	80	SA_REP
Janette	King	80	SA_REP
Patrick	Sully	80	SA_REP
Allan	McEwen	80	SA_REP
Lindsey	Smith	80	SA_REP
Louise	Doran	80	SA_REP
Sarath	Sewall	80	SA_REP
Clara	Vishney	80	SA_REP
Danielle	Greene	80	SA_REP
Mattea	Marvins	80	SA_REP
David	Lee	80	SA_REP
Sundar	Ande	80	SA_REP
Amit	Banda	80	SA_REP
Lisa	Ozer	80	SA_REP
Harrison	Bloom	80	SA_REP
Tayler	Fox	80	SA_REP
William	Smith	80	SA_REP
Elizabeth	Bates	80	SA_REP
Sundita	Kumar	80	SA_REP

12. Write a SQL query to find those employees who earn more than the average salary. Return employee ID, first name, last name.

```
select employee_id,first_name,last_name,salary
from employees
where salary >=
(select avg(salary) avgsalary
from employees);
```



employee_id	first_name	last_name	salary
103	Alexander	Hunold	9000.00
108	Nancy	Greenberg	12000.00
109	Daniel	Faviet	9000.00
111	Ismael	Sciarra	7700.00
112	Jose Manuel	Urman	7800.00
113	Luis	Popp	6900.00
114	Den	Raphaely	11000.00
120	Matthew	Weiss	8000.00
121	Adam	Fripp	8200.00
122	Payam	Kaufling	7900.00
123	Shanta	Vollman	6500.00
145	John	Russell	14000.00
146	Karen	Partners	13500.00
147	Alberto	Errazuriz	12000.00
148	Gerald	Cambrault	11000.00
149	Eleni	Zlotkey	10500.00
150	Peter	Tucker	10000.00
151	David	Bernstein	9500.00
152	Peter	Hall	9000.00
153	Christopher	Olsen	8000.00
154	Nanette	Cambrault	7500.00
155	Oliver	Tuvault	7000.00
156	Janette	King	10000.00
157	Patrick	Sully	9500.00

13.Write a SQL query to find all those employees who work in the Finance department. Return department ID, name (first), job ID, and department name.

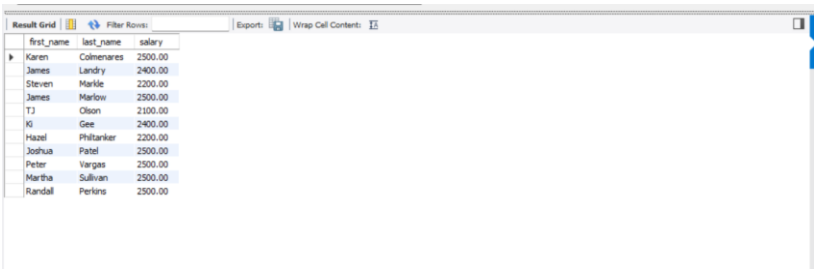
```
select d.department_id, e.first_name,e.job_id,d.department_name
from employees e
join departments d
on e.department_id = d.department_id
where department_name = 'finance';
```

department_id	first_name	job_id	department_name
100	Nancy	FI_MGR	Finance
100	Daniel	FI_ACCOUNT	Finance
100	Ismael	FI_ACCOUNT	Finance
100	Jose Manuel	FI_ACCOUNT	Finance
100	Luis	FI_ACCOUNT	Finance

Result 25

14.From the following table, write a SQL query to find the employees who earn less than the employee of ID 182. Return first name, last name, and salary.

```
select first_name,last_name, salary
from employees
where salary <=
(select salary
from employees
where employee_id = 182);
```



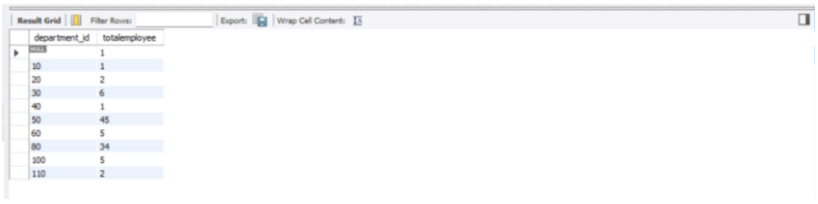
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

first_name	last_name	salary
Karen	Colmenares	2500.00
James	Landry	2400.00
Steven	Markle	2200.00
James	Marlow	2500.00
TJ	Olson	2100.00
Ki	Gee	2400.00
Hazel	Philtanker	2200.00
Joshua	Patel	2500.00
Peter	Vargas	2500.00
Martha	Sullivan	2500.00
Randall	Perkins	2500.00

stored procedure

15. Create a stored procedure CountEmployeesByDept that returns the number of employees in each department.

```
delimiter //
create procedure countemployee()
begin
   select department_id,count(*) as totalemployee
   from employees
   group by department_id;
end//
delimiter ;
call countemployee();
```



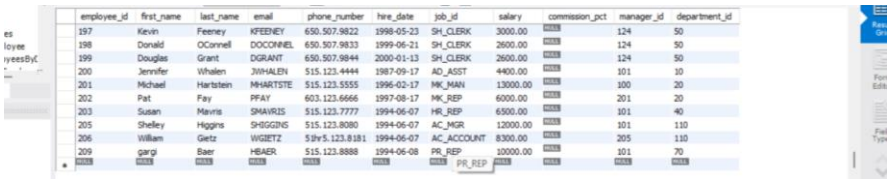
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

department_id	totalemployee
NULL	1
10	1
20	2
30	6
40	1
50	45
60	5
80	34
100	5
110	2

16.Create a stored procedure AddNewEmployee that adds a new employee to the database.

```
delimiter //
create procedure addnewemployee(
 in employee_id INT UNSIGNED ,
  in first_name VARCHAR(20),
   in last_name VARCHAR(25) ,
  in email VARCHAR(25) ,
  in phone_number VARCHAR(20),
```

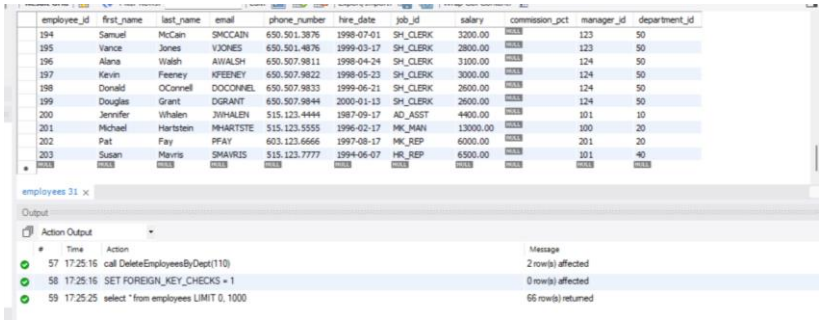
```
 in  hire_date DATE ,
 in  job_id VARCHAR(10) ,
 in  salary DECIMAL(8, 2),
 in  commission_pct DECIMAL(5, 2),
 in  manager_id INT UNSIGNED,
 in  department_id INT UNSIGNED
)
begin
 INSERT INTO employees
VALUES
(employee_id, first_name, last_name, email, phone_number, hire_date, job_id, salary, commission_pct, manager_id, department_id);
end //
delimiter ;
SET FOREIGN_KEY_CHECKS = 1;
call addNEWemployee(209, 'gargi', 'Baer', 'HBAER', '515.123.8888', '1994-06-08', 'PR_REP', 10000, NULL, 101, 70);
SET FOREIGN_KEY_CHECKS = 1;
```



employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct	manager_id	department_id
197	Kevin	Feeney	KFEENEY	650.507.9822	1998-05-23	SH_CLERK	3000.00	NULL	124	50
198	Donald	OConnell	DOCONNEL	650.507.9833	1999-06-21	SH_CLERK	2600.00	NULL	124	50
199	Douglas	Grant	DGRANT	650.507.9844	2000-01-13	SH_CLERK	2600.00	NULL	124	50
200	Jennifer	Whalen	JWHALEN	515.123.4444	1987-09-17	AD_ASST	4400.00	NULL	101	10
201	Michael	Hartstein	MHARTSTE	515.123.5555	1996-02-17	MK_MAN	13000.00	NULL	100	20
202	Pat	Fay	PFAY	603.123.6666	1997-08-17	MK_REP	6000.00	NULL	201	20
203	Susan	Mavris	SMAVRIS	515.123.7777	1994-06-07	HR_REP	6500.00	NULL	101	40
205	Shelley	Higgins	SHIGGINS	515.123.8080	1994-06-07	AC_MGR	12000.00	NULL	101	110
206	William	Gietz	WGIETZ	51jv5.123.8181	1994-06-07	AC_ACCOUNT	8300.00	NULL	205	110
209	gargi	Baer	HBAER	515.123.8888	1994-06-08	PR_REP	10000.00	NULL	101	70
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

17. Create a stored procedure DeleteEmployeesByDept that removes all employees from a specific department.

```
delimiter //
create procedure DeleteEmployeesByDept(in dept_id int unsigned)
begin
   delete
   from employees
   where  dept_id = department_id;
end //
delimiter ;
 SET FOREIGN_KEY_CHECKS = 0;
call DeleteEmployeesByDept(70);
SET FOREIGN_KEY_CHECKS = 0;
```



employee_id	first_name	last_name	email	phone_number	hire_date	job_id	salary	commission_pct	manager_id	department_id
194	Samuel	McCain	SMCCAIN	650.501.3876	1998-07-01	SH_CLERK	3200.00	NULL	123	50
195	Vance	Jones	VJONES	650.501.4876	1999-03-17	SH_CLERK	2800.00	NULL	123	50
196	Alana	Walsh	AWALSH	650.507.9811	1998-04-24	SH_CLERK	3100.00	NULL	124	50
197	Kevin	Feeney	KFEENEY	650.507.9822	1998-05-23	SH_CLERK	3000.00	NULL	124	50
198	Donald	OConnell	DOCONNEL	650.507.9833	1999-06-21	SH_CLERK	2600.00	NULL	124	50
199	Douglas	Grant	DGRANT	650.507.9844	2000-01-13	SH_CLERK	2600.00	NULL	124	50
200	Jennifer	Whalen	JWHALEN	515.123.4444	1987-09-17	AD_ASST	4400.00	NULL	101	10
201	Michael	Hartstein	MHARTSTE	515.123.5555	1996-02-17	MK_MAN	13000.00	NULL	100	20
202	Pat	Fay	PFAY	603.123.6666	1997-08-17	MK_REP	6000.00	NULL	201	20
203	Susan	Mavris	SMAVRIS	515.123.7777	1994-06-07	HR_REP	6500.00	NULL	101	40
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

employees 31 ×

Output

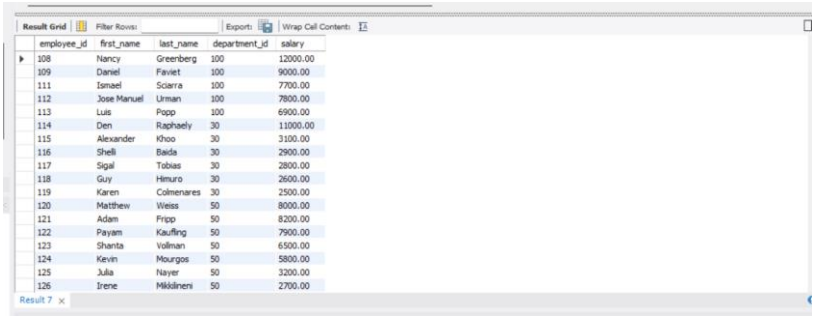
Action Output

#	Time	Action	Message
57	17:25:16	call DeleteEmployeesByDept(110)	2 row(s) affected
58	17:25:16	SET FOREIGN_KEY_CHECKS = 1	0 row(s) affected
59	17:25:25	select * from employees LIMIT 0, 1000	66 row(s) returned

18. Create a stored procedure GetTopPaidEmployees that retrieves the highest-paid employee in each department.

```
DELIMITER //
CREATE PROCEDURE GetTopPaidEmployees()
BEGIN
```

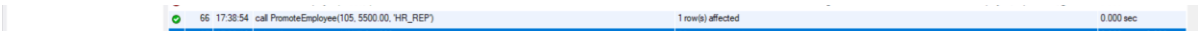
```
  SELECT e.employee_id, e.first_name, e.last_name, e.department_id, e.salary
   FROM employees e
   WHERE e.salary = (
      SELECT MAX(e.salary)
      FROM employees
      WHERE department_id = e.department_id
      );
END //

DELIMITER ;

CALL GetTopPaidEmployees();
```



employee_id	first_name	last_name	department_id	salary
108	Nancy	Greenberg	100	12000.00
109	Daniel	Faviet	100	9000.00
111	Ismael	Sciarra	100	7700.00
112	Jose Manuel	Urman	100	7800.00
113	Luis	Popp	100	6900.00
114	Den	Raphaely	30	11000.00
115	Alexander	Khoo	30	3100.00
116	Shelli	Baida	30	2900.00
117	Sigal	Tobias	30	2800.00
118	Guy	Himuro	30	2600.00
119	Karen	Colmenares	30	2500.00
120	Matthew	Weiss	50	8000.00
121	Adam	Fripp	50	8200.00
122	Payam	Kaufling	50	7900.00
123	Shanta	Vollman	50	6500.00
124	Kevin	Mourgos	50	5800.00
125	Julia	Nayer	50	3200.00
126	Irene	Mikkilineni	50	2700.00

19. Create a stored procedure PromoteEmployee that increases an employee's salary and changes their job role.

```
delimiter //
create procedure PromoteEmployee(IN emp_id INT,
   IN new_salary DECIMAL(8,2),
   IN new_job_id VARCHAR(10)
)
begin
update employees
set salary = new_salary,
      job_id = new_job_id
   WHERE employee_id = emp_id;
end //
delimiter ;
call PromoteEmployee(105, 5500.00, 'HR_REP');
```



20. Create a stored procedure AssignManagerToDepartment that assigns a new manager to all employees in a specific department.

```
delimiter //
create procedure AssignManagerToDepartment (in  dept_id INT UNSIGNED,
in  new_manager_id INT UNSIGNED)
begin
update employees
set manager_id = new_manager_id
where department_id = dept_id;
```

end //

delimiter ;

call AssignManagerToDepartment(50,114);

No-sql

1.retrive all employee records.

db.collection.find()

2.find employee who work in the IT department.

employee> db.collection.find({department:'IT'});

```
employee> db.collection.find({department:'IT'});
[
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6a'),
    name: 'Bob Smith',
    age: 40,
    department: 'IT',
    salary: 80000,
    joining_date: '2015-08-20'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6c'),
    name: 'David White',
    age: 28,
    department: 'IT',
    salary: 72000,
    joining_date: '2021-01-10'
  },
  {
    _id: ObjectId('685d1125f2b99a1d0c748a60'),
    name: 'Bob Smith',
    age: 40,
    department: 'IT',
    salary: 80000,
    joining_date: '2015-08-20'
  },
  {
    _id: ObjectId('685d1125f2b99a1d0c748a62'),
    name: 'David White',
    age: 28,
    department: 'IT',
    salary: 72000,
    joining_date: '2021-01-10'
  },
  {
    _id: ObjectId('685d1125f2b99a1d0c748a66'),
    name: 'Henry Ford',
    age: 50,
    department: 'IT',
    salary: 95000,
    joining_date: '2008-12-15'
  }
]
```

3.find employee who have a salary greater than 70000.

employee> db.collection.find({salary:{$gt:70000}});

```
employee> db.collection.find({salary:{$gt:70000}});
[
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6a'),
    name: 'Bob Smith',
    age: 40,
    department: 'IT',
    salary: 80000,
    joining_date: '2015-08-20'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6b'),
    name: 'Charlie Brown',
    age: 35,
    department: 'Finance',
    salary: 78750,
    joining_date: '2018-11-30'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6c'),
    name: 'David White',
    age: 28,
    department: 'IT',
    salary: 72000,
    joining_date: '2021-01-10'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6e'),
    name: 'Franklin Adams',
    age: 45,
    department: 'Finance',
    salary: 94500,
    joining_date: '2010-07-12'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a72'),
    name: 'Jack Carter',
    age: 27,
    department: 'Finance',
    salary: 71400,
    joining_date: '2022-04-10'
  },
  {
    _id: ObjectId('685d1125f2b99a1d0c748a60'),
    name: 'Bob Smith',
    age: 40,
    department: 'IT',
    salary: 80000,
```

4. find employee who joined after 2018.

employee> db.collection.find({joining_date:{$gt:'2018'}});

```
employee> db.collection.find({joining_date:{$gt:'2018'}});
[
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a69'),
    name: 'Alice Johnson',
    age: 30,
    department: 'HR',
    salary: 60000,
    joining_date: '2019-05-15'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6b'),
    name: 'Charlie Brown',
    age: 35,
    department: 'Finance',
    salary: 78750,
    joining_date: '2018-11-30'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6c'),
    name: 'David White',
    age: 28,
    department: 'IT',
    salary: 72000,
    joining_date: '2021-01-10'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6f'),
    name: 'Grace Lee',
    age: 29,
    department: 'HR',
    salary: 58000,
    joining_date: '2020-06-05'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a72'),
    name: 'Jack Carter',
    age: 27,
    department: 'Finance',
    salary: 71400,
    joining_date: '2022-04-10'
  },
  {
    _id: ObjectId('685d1125f2b99a1d0c748a5f'),
    name: 'Alice Johnson',
    age: 30,
    department: 'HR',
    salary: 60000,
    joining_date: '2019-05-15'
  },
```

5.find employee between the ages of 30 and 40.

employee> db.collection.find({age:{$gt:30,$lt:40}});

```
employee> db.collection.find({age:{$gt:30,$lt:40}});
[
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6b'),
    name: 'Charlie Brown',
    age: 35,
    department: 'Finance',
    salary: 78750,
    joining_date: '2018-11-30'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a6d'),
    name: 'Emma Wilson',
    age: 32,
    department: 'Marketing',
    salary: 65000,
    joining_date: '2017-03-25'
  },
  {
    _id: ObjectId('685bc5f8d1ebee75a6748a71'),
    name: 'Isabella Martinez',
    age: 38,
    department: 'Marketing',
    salary: 70000,
    joining_date: '2016-09-18'
  },
  {
    _id: ObjectId('685d1125f2b99a1d0c748a61'),
    name: 'Charlie Brown',
    age: 35,
    department: 'Finance',
    salary: 75000,
    joining_date: '2018-11-30'
  },
  {
    _id: ObjectId('685d1125f2b99a1d0c748a63'),
    name: 'Emma Wilson',
    age: 32,
    department: 'Marketing',
    salary: 65000,
    joining_date: '2017-03-25'
  },
  {
    _id: ObjectId('685d1125f2b99a1d0c748a67'),
    name: 'Isabella Martinez',
    age: 38,
    department: 'Marketing',
    salary: 70000,
    joining_date: '2016-09-18'
```

6.increase the salary of all employee in the finance department by 5%.

employee> db.collection.updateMany({department:'Finance'},{$mul:{salary:1.05}});

```
employee> db.collection.updateMany({department:'Finance'},{$mul:{salary:1.05}});
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 6,
  modifiedCount: 6,
  upsertedCount: 0
}
```

7.delete employee who joined before 2010.

employee> db.collection.deleteMany({joining_date:{$lt:"2010"}});

```
employee> db.collection.deleteMany({joining_date:{$lt:"2010"}});
{ acknowledged: true, deletedCount: 1 }
employee>
```

8. find the highest-paid employee.

db.collection.find().sort({salary:-1}).limit(1);