ASSIGNMENT 8

CREATING TABLES:

```
-- Create Regions Table CREATE TABLE Regions ( RegionID INT PRIMARY KEY, RegionName VARCHAR(50) );
```

```
INSERT INTO Regions (RegionID, RegionName) VALUES (1, 'North America'), (2, 'Europe'), (3, 'Asia'), (4, 'South America'), (5, 'Africa');
```

```
-- Create Countries Table CREATE TABLE Countries ( CountryID INT PRIMARY KEY, CountryName VARCHAR(50), RegionID INT, FOREIGN KEY (RegionID) REFERENCES Regions(RegionID) );
```

```
INSERT INTO Countries (CountryID, CountryName, RegionID) VALUES (1, 'United States', 1), (2, 'Canada', 1), (3, 'Germany', 2), (4, 'France', 2), (5, 'Japan', 3), (6, 'China', 3), (7, 'Brazil', 4), (8, 'Argentina', 4);
```

```
-- Create Locations Table CREATE TABLE Locations ( LocationID INT PRIMARY KEY, StreetAddress VARCHAR(100), PostalCode VARCHAR(20), City VARCHAR(50), StateProvince VARCHAR(50), CountryID INT, FOREIGN KEY (CountryID) REFERENCES Countries(CountryID) );
```

```
INSERT INTO Locations (LocationID, StreetAddress, PostalCode, City, StateProvince, CountryID) VALUES (1, '123 Tech Lane', '94000', 'San Francisco', 'CA', 1), (2, '456 Maple Road', 'M5V 2T6', 'Toronto', 'ON', 2), (3, 'Unter den Linden 1', '10117', 'Berlin', 'Berlin', 3), (4, '789 Rue de la Paix', '75008', 'Paris', 'Ile-de-France', 4);
```

```
-- Create Jobs Table CREATE TABLE Jobs ( JobID INT PRIMARY KEY, JobTitle VARCHAR(50), MinSalary DECIMAL(10,2), MaxSalary DECIMAL(10,2) );
```

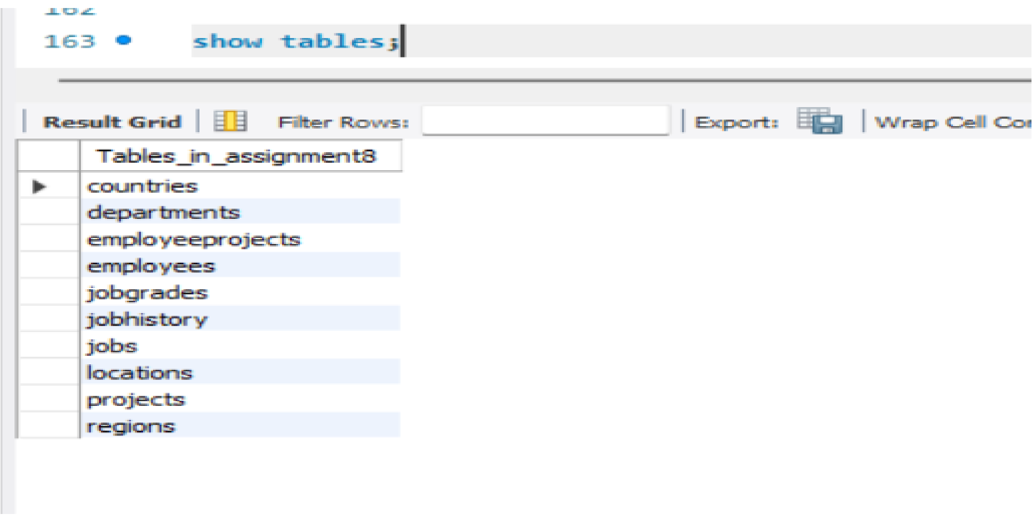
```
INSERT INTO Jobs (JobID, JobTitle, MinSalary, MaxSalary) VALUES (1, 'Software Engineer', 60000.00, 120000.00), (2, 'Project Manager', 80000.00, 150000.00), (3, 'Data Analyst', 50000.00, 90000.00), (4, 'HR Specialist', 45000.00, 85000.00), (5, 'Sales Representative', 40000.00, 100000.00);
```

```
-- Create JobGrades Table CREATE TABLE JobGrades ( GradeLevel VARCHAR(2) PRIMARY KEY, LowestSal DECIMAL(10,2), HighestSal DECIMAL(10,2) );
```

```
INSERT INTO JobGrades (GradeLevel, LowestSal, HighestSal) VALUES ('A', 0, 30000), ('B',
30001, 50000), ('C', 50001, 80000), ('D', 80001, 120000), ('E', 120001, 200000);

-- Create Departments Table CREATE TABLE Departments ( DeptID INT PRIMARY KEY,
DeptName VARCHAR(50), Location INT, FOREIGN KEY (Location) REFERENCES
Locations(LocationID) );

INSERT INTO Departments (DeptID, DeptName, Location) VALUES (1, 'Engineering', 1), (2,
'Human Resources', 2), (3, 'Sales', 3), (4, 'Marketing', 4);

-- Create Employees Table CREATE TABLE Employees ( EmpID INT PRIMARY KEY, Name
VARCHAR(100), DepartmentID INT, Salary DECIMAL(10,2), JobID INT, ManagerID INT,
FOREIGN KEY (DepartmentID) REFERENCES Departments(DeptID), FOREIGN KEY (JobID)
REFERENCES Jobs(JobID), FOREIGN KEY (ManagerID) REFERENCES Employees(EmpID) );

INSERT INTO Employees (EmpID, Name, DepartmentID, Salary, JobID, ManagerID) VALUES
(1, 'John Doe', 1, 90000.00, 1, NULL), (2, 'Jane Smith', 1, 95000.00, 2, 1), (3, 'Mike Johnson',
2, 70000.00, 4, 2), (4, 'Emily Brown', 3, 80000.00, 5, 1), (5, 'David Wilson', 4, 85000.00, 3, 2);

-- Create JobHistory Table CREATE TABLE JobHistory ( EmpID INT, StartDate DATE,
EndDate DATE, JobID INT, DepartmentID INT, PRIMARY KEY (EmpID, StartDate), FOREIGN
KEY (EmpID) REFERENCES Employees(EmpID), FOREIGN KEY (JobID) REFERENCES
Jobs(JobID), FOREIGN KEY (DepartmentID) REFERENCES Departments(DeptID) );

INSERT INTO JobHistory (EmpID, StartDate, EndDate, JobID, DepartmentID) VALUES (1,
'2018-01-15', '2020-06-30', 1, 1), (2, '2019-03-01', '2021-12-31', 2, 1), (3, '2017-11-01',
'2022-05-15', 4, 2), (4, '2020-02-15', NULL, 5, 3), (5, '2019-07-01', '2022-01-31', 3, 4);

-- Create Projects Table CREATE TABLE Projects ( ProjectID INT PRIMARY KEY,
ProjectName VARCHAR(100), DeptID INT, FOREIGN KEY (DeptID) REFERENCES
Departments(DeptID) );

INSERT INTO Projects (ProjectID, ProjectName, DeptID) VALUES (1, 'Website Redesign', 1),
(2, 'Employee Training Program', 2), (3, 'New Product Launch', 3), (4, 'Market Research', 4);

-- Create EmployeeProjects Table CREATE TABLE EmployeeProjects ( EmpID INT, ProjectID
INT, Role VARCHAR(50), PRIMARY KEY (EmpID, ProjectID), FOREIGN KEY (EmpID)
REFERENCES Employees(EmpID), FOREIGN KEY (ProjectID) REFERENCES
Projects(ProjectID) );
```

INSERT INTO EmployeeProjects (EmpID, ProjectID, Role) VALUES (1, 1, 'Lead Developer'), (2, 1, 'Project Manager'), (3, 2, 'Coordinator'), (4, 3, 'Sales Lead'), (5, 4, 'Analyst');

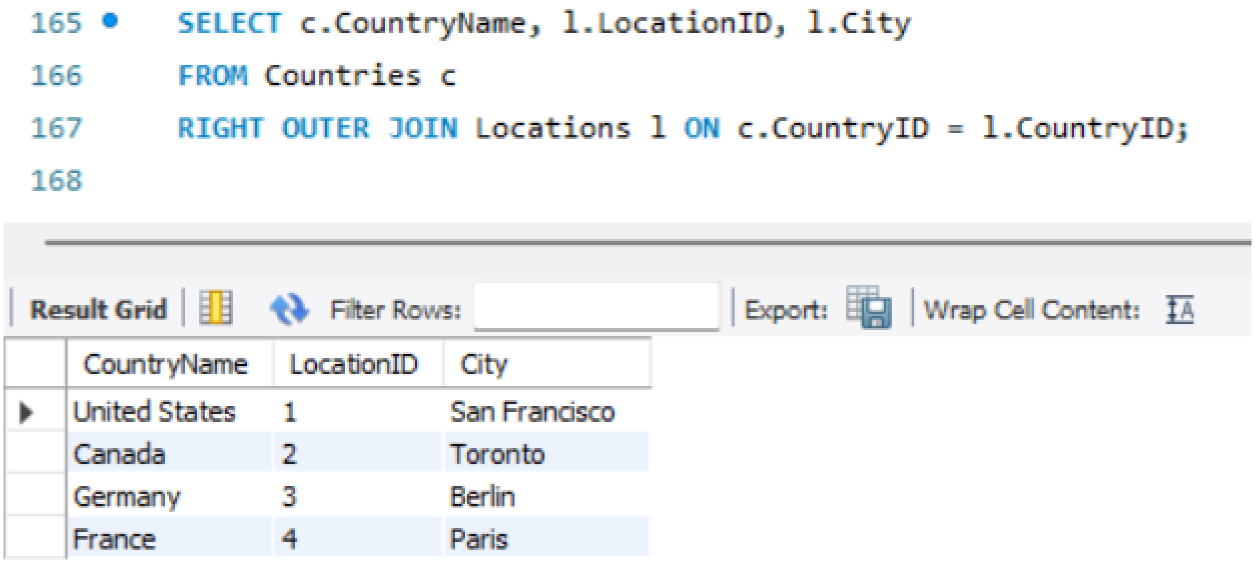
Q1.)



```sql
show tables;
```

Tables_in_assignment8
countries
departments
employeeprojects
employees
jobgrades
jobhistory
jobs
locations
projects
regions

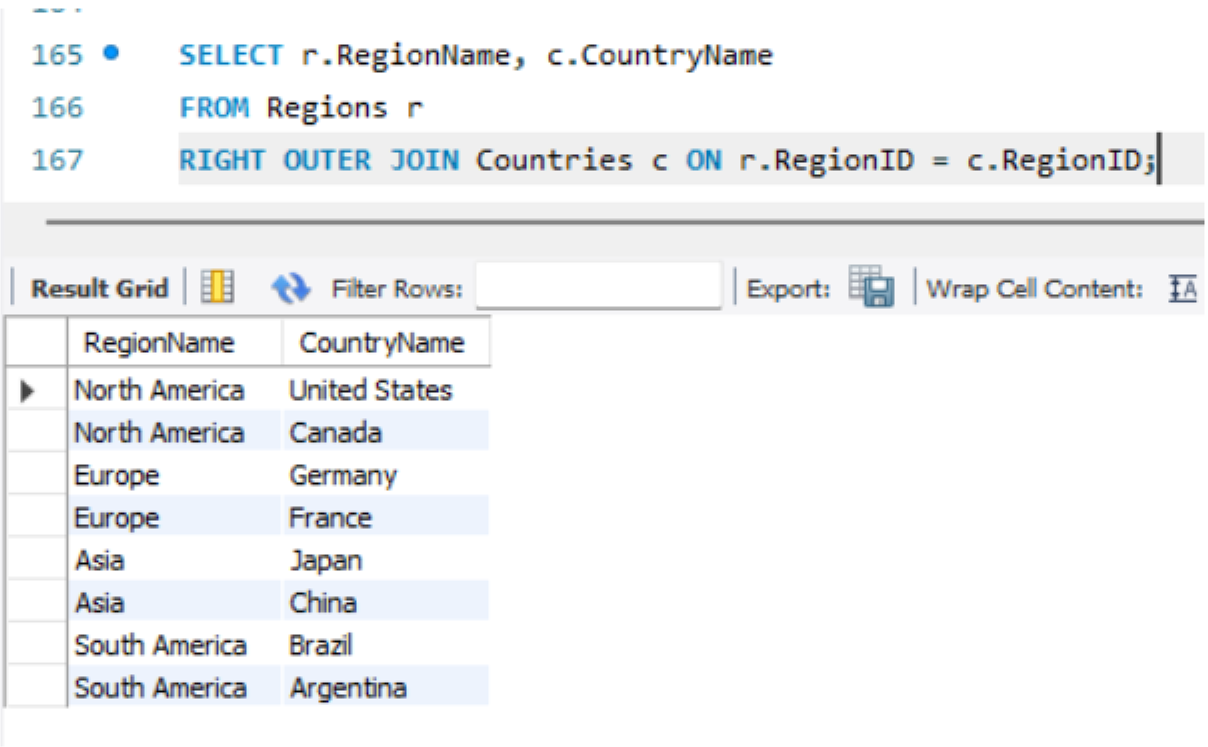
Q1.)



```sql
SELECT c.CountryName, l.LocationID, l.City
FROM Countries c
RIGHT OUTER JOIN Locations l ON c.CountryID = l.CountryID;
```

CountryName	LocationID	City
United States	1	San Francisco
Canada	2	Toronto
Germany	3	Berlin
France	4	Paris

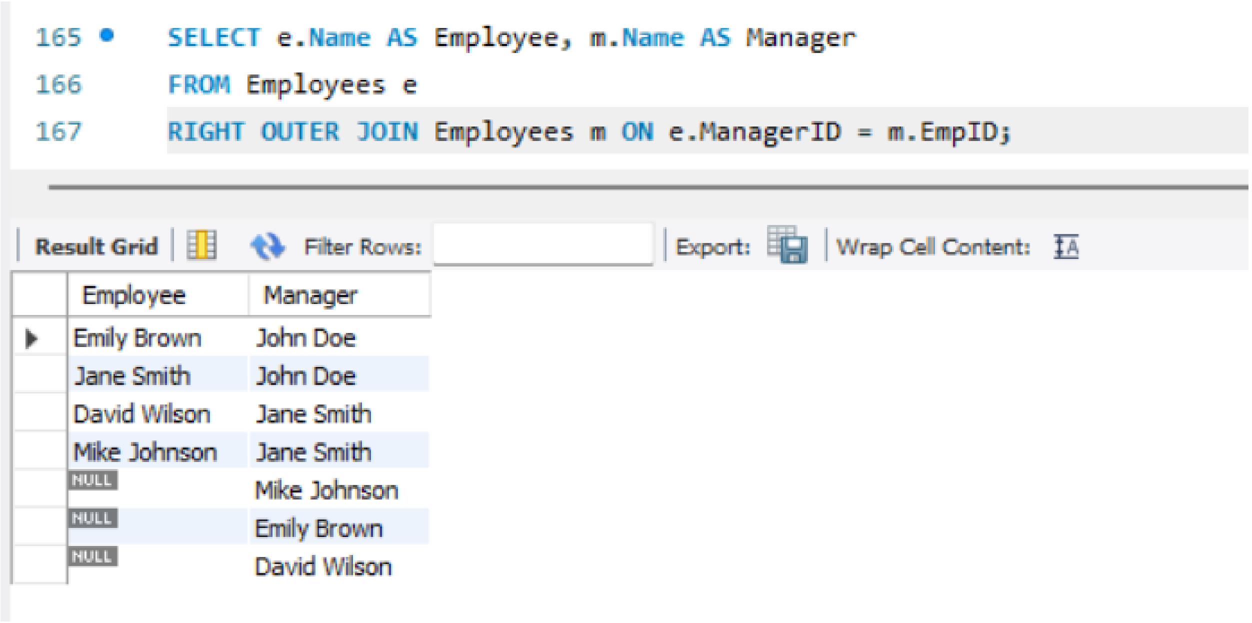
Q2.)



```sql
SELECT r.RegionName, c.CountryName
FROM Regions r
RIGHT OUTER JOIN Countries c ON r.RegionID = c.RegionID;
```

RegionName	CountryName
North America	United States
North America	Canada
Europe	Germany
Europe	France
Asia	Japan
Asia	China
South America	Brazil
South America	Argentina

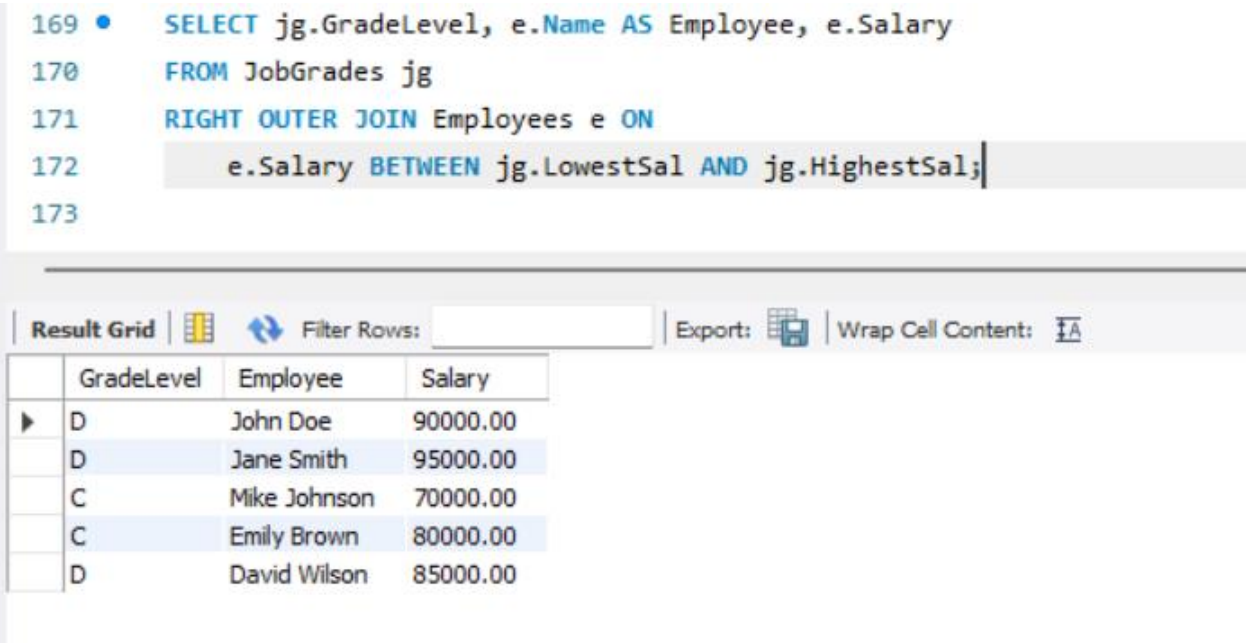
Q3.)



```sql
SELECT e.Name AS Employee, m.Name AS Manager
FROM Employees e
RIGHT OUTER JOIN Employees m ON e.ManagerID = m.EmpID;
```

Employee	Manager
Emily Brown	John Doe
Jane Smith	John Doe
David Wilson	Jane Smith
Mike Johnson	Jane Smith
NULL	Mike Johnson
NULL	Emily Brown
NULL	David Wilson

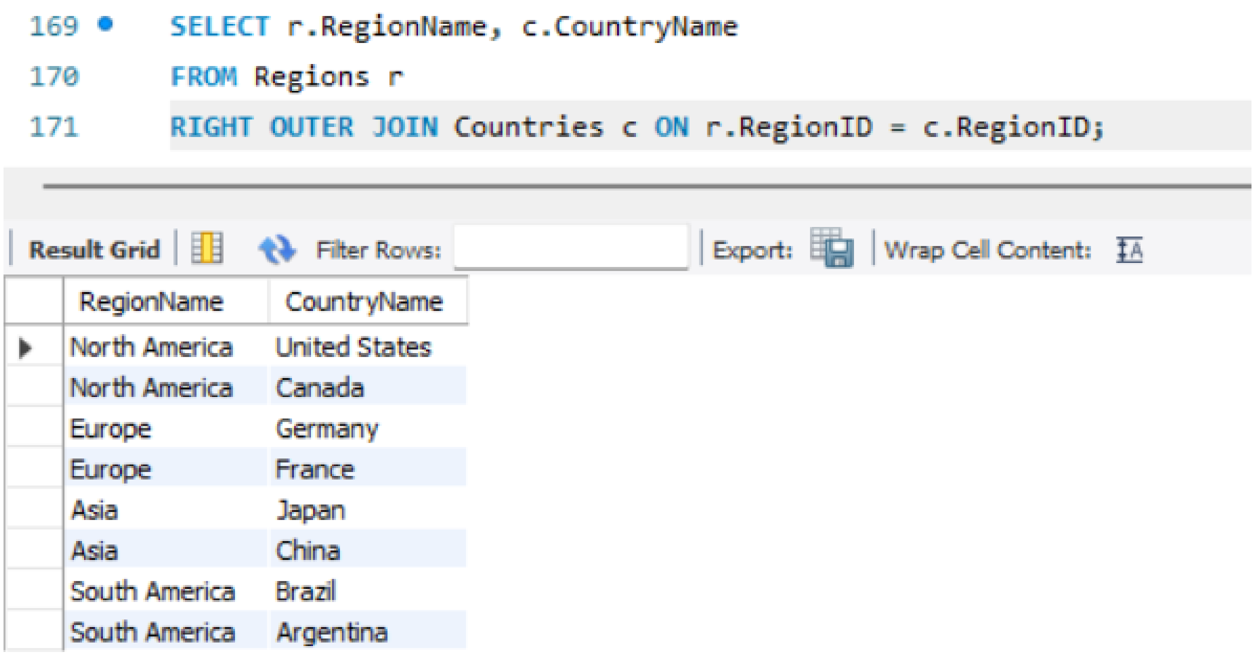
Q4.)



```sql
SELECT jg.GradeLevel, e.Name AS Employee, e.Salary
FROM JobGrades jg
RIGHT OUTER JOIN Employees e ON
    e.Salary BETWEEN jg.LowestSal AND jg.HighestSal;
```

GradeLevel	Employee	Salary
D	John Doe	90000.00
D	Jane Smith	95000.00
C	Mike Johnson	70000.00
C	Emily Brown	80000.00
D	David Wilson	85000.00

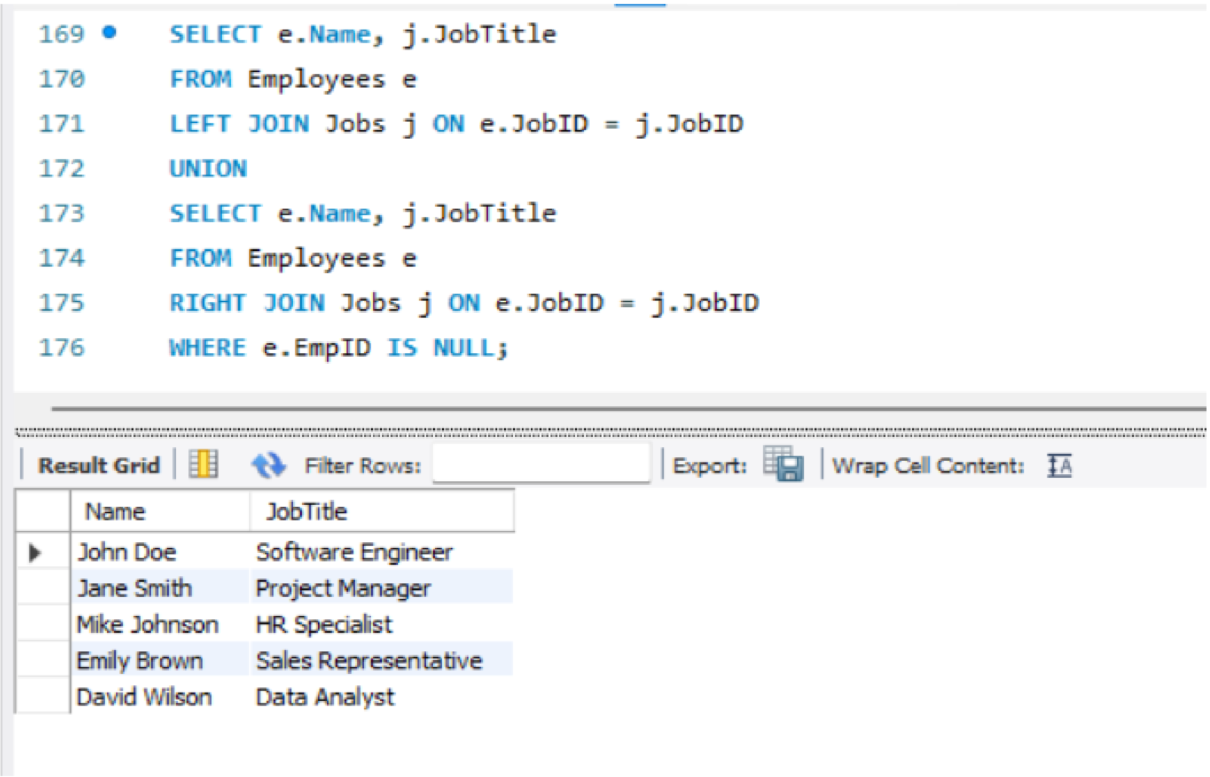
Q5.)



```sql
SELECT r.RegionName, c.CountryName
FROM Regions r
RIGHT OUTER JOIN Countries c ON r.RegionID = c.RegionID;
```

RegionName	CountryName
North America	United States
North America	Canada
Europe	Germany
Europe	France
Asia	Japan
Asia	China
South America	Brazil
South America	Argentina

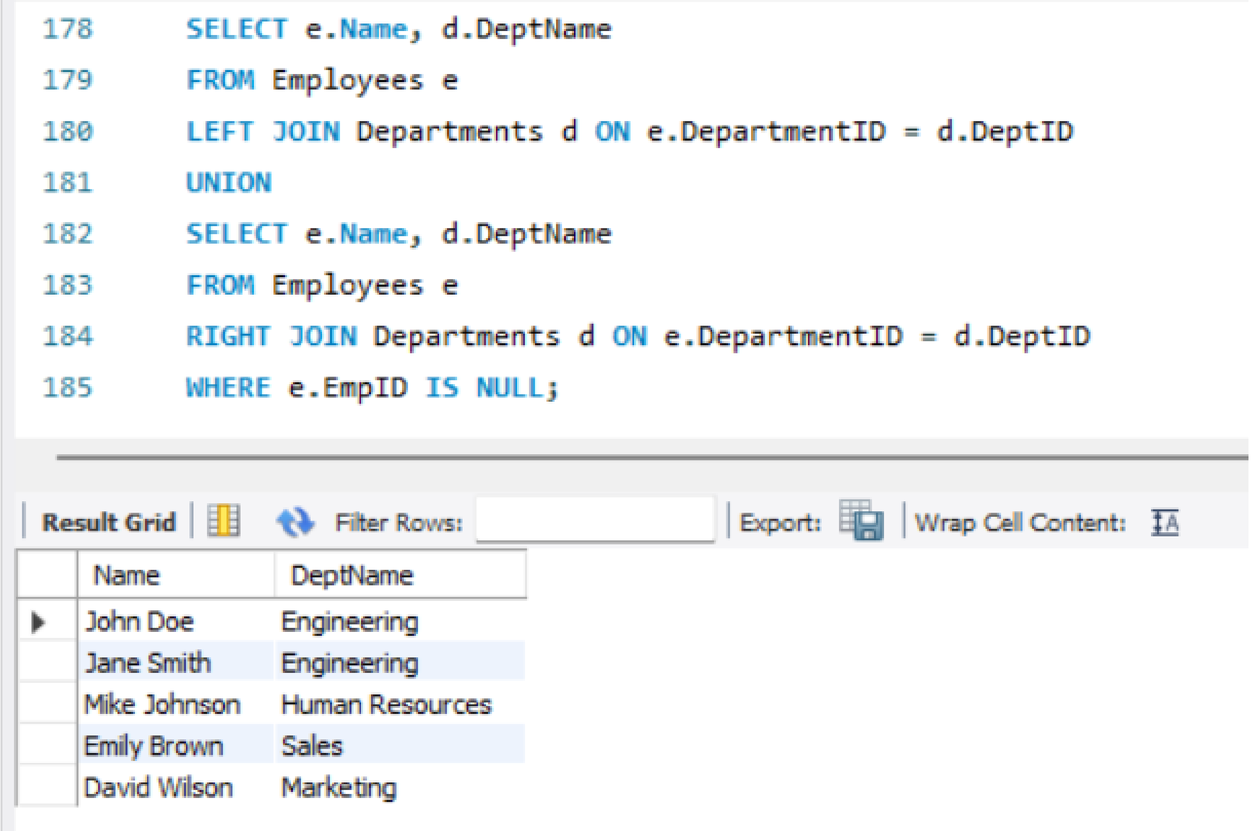
Q6.)



```sql
SELECT e.Name, j.JobTitle
FROM Employees e
LEFT JOIN Jobs j ON e.JobID = j.JobID
UNION
SELECT e.Name, j.JobTitle
FROM Employees e
RIGHT JOIN Jobs j ON e.JobID = j.JobID
WHERE e.EmpID IS NULL;
```

Name	JobTitle
John Doe	Software Engineer
Jane Smith	Project Manager
Mike Johnson	HR Specialist
Emily Brown	Sales Representative
David Wilson	Data Analyst

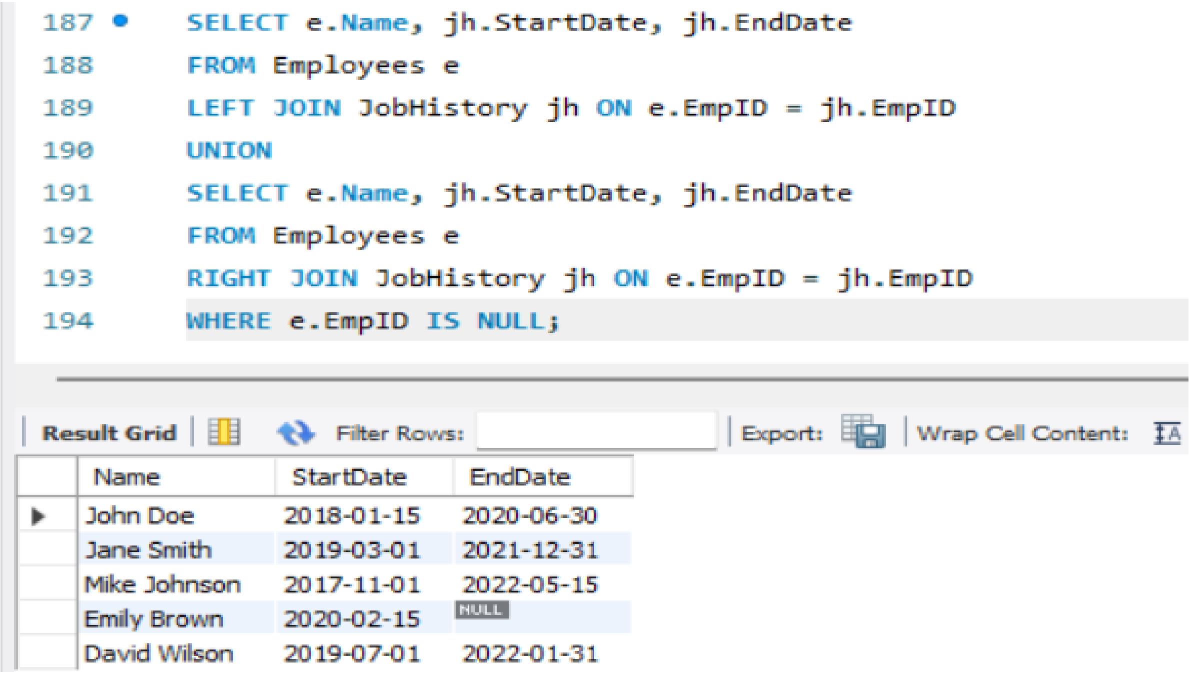
Q7.)



```sql
SELECT e.Name, d.DeptName
FROM Employees e
LEFT JOIN Departments d ON e.DepartmentID = d.DeptID
UNION
SELECT e.Name, d.DeptName
FROM Employees e
RIGHT JOIN Departments d ON e.DepartmentID = d.DeptID
WHERE e.EmpID IS NULL;
```

Name	DeptName
John Doe	Engineering
Jane Smith	Engineering
Mike Johnson	Human Resources
Emily Brown	Sales
David Wilson	Marketing

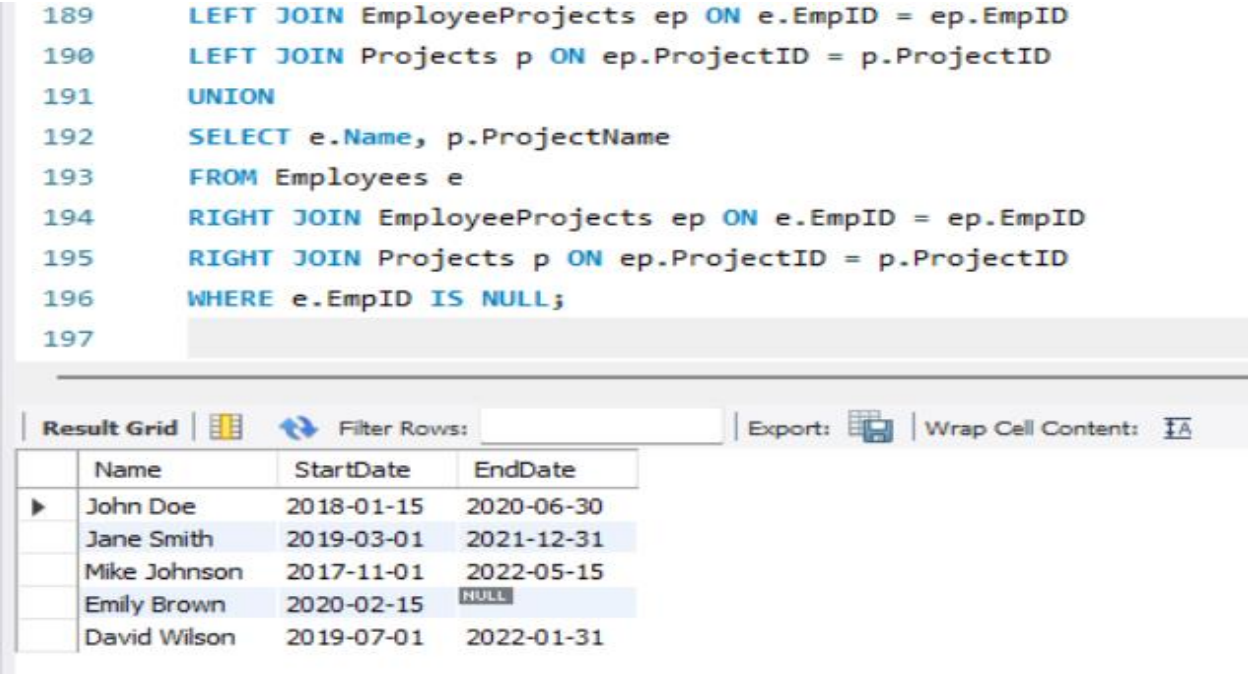
Q8.)



```
SELECT e.Name, jh.StartDate, jh.EndDate
FROM Employees e
LEFT JOIN JobHistory jh ON e.EmpID = jh.EmpID
UNION
SELECT e.Name, jh.StartDate, jh.EndDate
FROM Employees e
RIGHT JOIN JobHistory jh ON e.EmpID = jh.EmpID
WHERE e.EmpID IS NULL;
```

Name	StartDate	EndDate
John Doe	2018-01-15	2020-06-30
Jane Smith	2019-03-01	2021-12-31
Mike Johnson	2017-11-01	2022-05-15
Emily Brown	2020-02-15	NULL
David Wilson	2019-07-01	2022-01-31

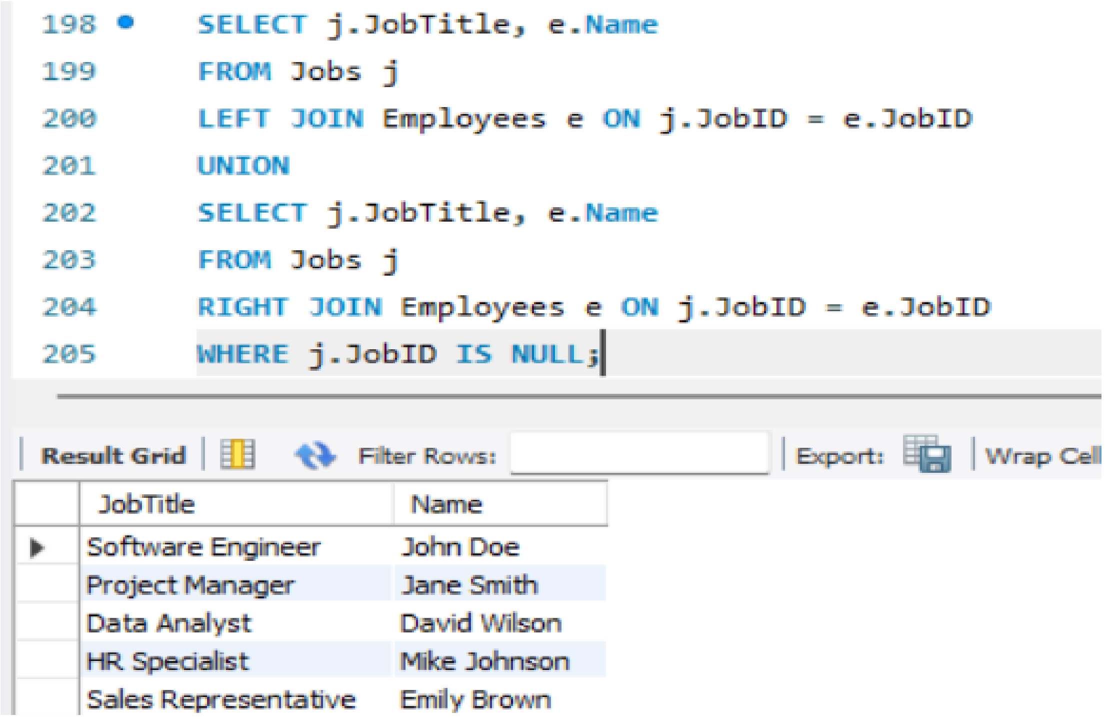
Q9.)



```
LEFT JOIN EmployeeProjects ep ON e.EmpID = ep.EmpID
LEFT JOIN Projects p ON ep.ProjectID = p.ProjectID
UNION
SELECT e.Name, p.ProjectName
FROM Employees e
RIGHT JOIN EmployeeProjects ep ON e.EmpID = ep.EmpID
RIGHT JOIN Projects p ON ep.ProjectID = p.ProjectID
WHERE e.EmpID IS NULL;

```

Name	StartDate	EndDate
John Doe	2018-01-15	2020-06-30
Jane Smith	2019-03-01	2021-12-31
Mike Johnson	2017-11-01	2022-05-15
Emily Brown	2020-02-15	NULL
David Wilson	2019-07-01	2022-01-31

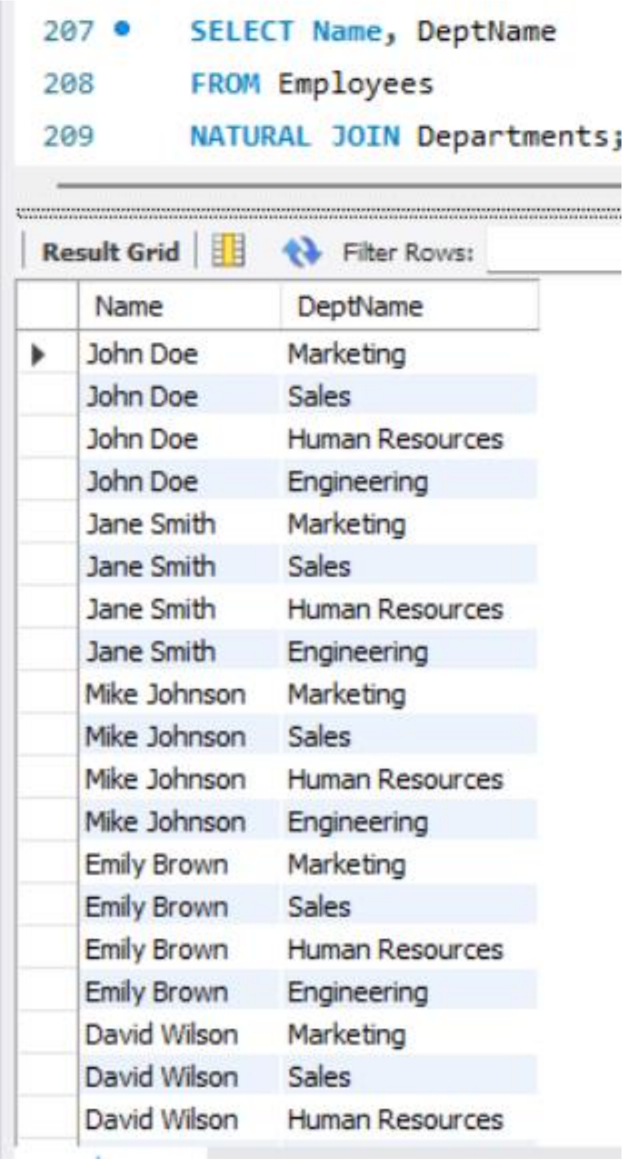
Q10.)



```sql
SELECT j.JobTitle, e.Name
FROM Jobs j
LEFT JOIN Employees e ON j.JobID = e.JobID
UNION
SELECT j.JobTitle, e.Name
FROM Jobs j
RIGHT JOIN Employees e ON j.JobID = e.JobID
WHERE j.JobID IS NULL;
```

JobTitle	Name
Software Engineer	John Doe
Project Manager	Jane Smith
Data Analyst	David Wilson
HR Specialist	Mike Johnson
Sales Representative	Emily Brown

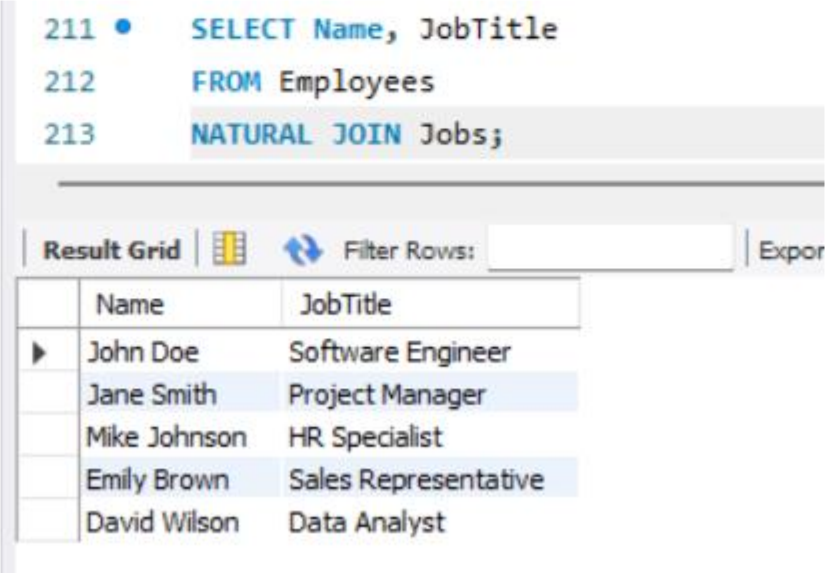
Q11.)



```sql
SELECT Name, DeptName
FROM Employees
NATURAL JOIN Departments;
```

Name	DeptName
John Doe	Marketing
John Doe	Sales
John Doe	Human Resources
John Doe	Engineering
Jane Smith	Marketing
Jane Smith	Sales
Jane Smith	Human Resources
Jane Smith	Engineering
Mike Johnson	Marketing
Mike Johnson	Sales
Mike Johnson	Human Resources
Mike Johnson	Engineering
Emily Brown	Marketing
Emily Brown	Sales
Emily Brown	Human Resources
Emily Brown	Engineering
David Wilson	Marketing
David Wilson	Sales
David Wilson	Human Resources

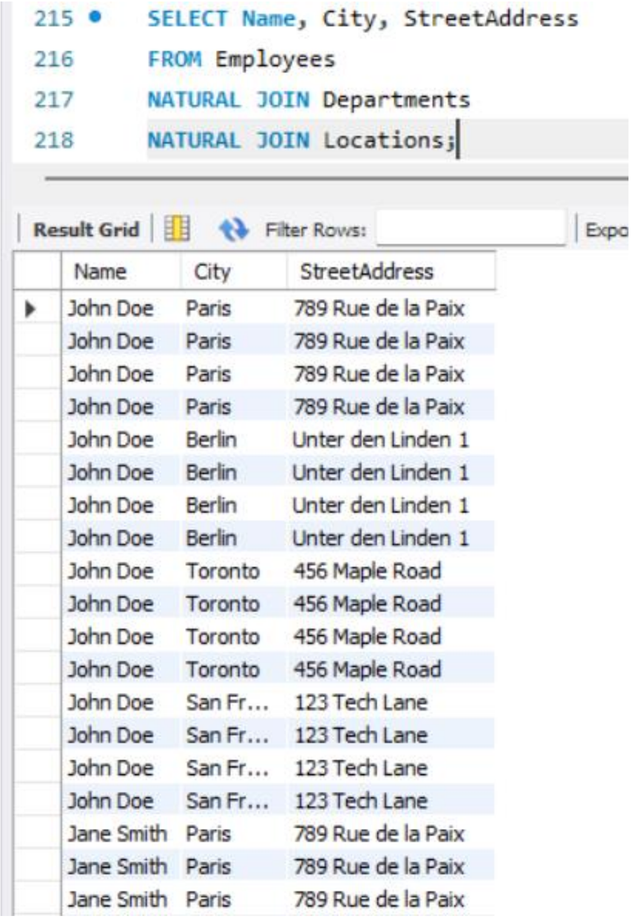
Q12.)



```sql
SELECT Name, JobTitle
FROM Employees
NATURAL JOIN Jobs;
```

	Name	JobTitle
▶	John Doe	Software Engineer
	Jane Smith	Project Manager
	Mike Johnson	HR Specialist
	Emily Brown	Sales Representative
	David Wilson	Data Analyst

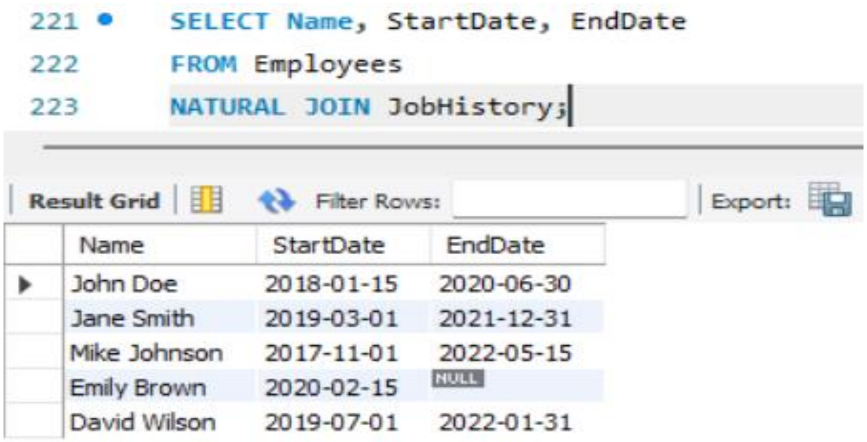
Q13.)



```sql
SELECT Name, City, StreetAddress
FROM Employees
NATURAL JOIN Departments
NATURAL JOIN Locations;
```

	Name	City	StreetAddress
▶	John Doe	Paris	789 Rue de la Paix
	John Doe	Paris	789 Rue de la Paix
	John Doe	Paris	789 Rue de la Paix
	John Doe	Paris	789 Rue de la Paix
	John Doe	Berlin	Unter den Linden 1
	John Doe	Berlin	Unter den Linden 1
	John Doe	Berlin	Unter den Linden 1
	John Doe	Berlin	Unter den Linden 1
	John Doe	Toronto	456 Maple Road
	John Doe	Toronto	456 Maple Road
	John Doe	Toronto	456 Maple Road
	John Doe	Toronto	456 Maple Road
	John Doe	San Fr...	123 Tech Lane
	John Doe	San Fr...	123 Tech Lane
	John Doe	San Fr...	123 Tech Lane
	John Doe	San Fr...	123 Tech Lane
	Jane Smith	Paris	789 Rue de la Paix
	Jane Smith	Paris	789 Rue de la Paix
	Jane Smith	Paris	789 Rue de la Paix

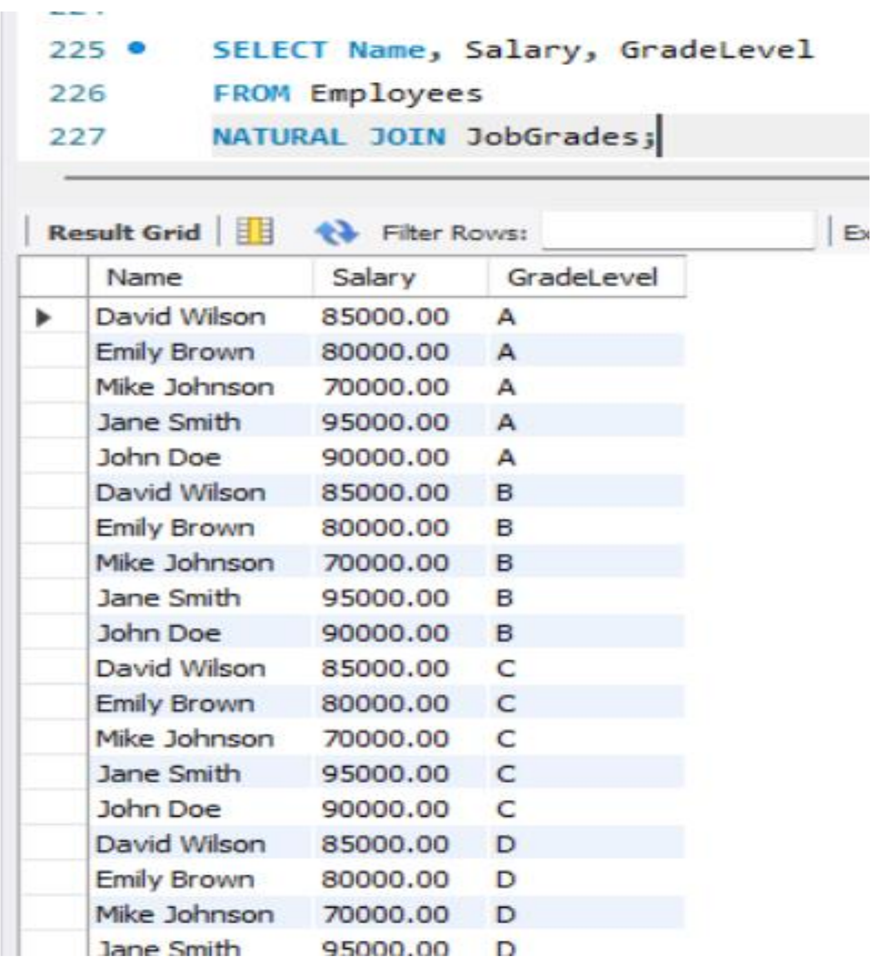
Q14.)



```
SELECT Name, StartDate, EndDate
FROM Employees
NATURAL JOIN JobHistory;
```

Name	StartDate	EndDate
John Doe	2018-01-15	2020-06-30
Jane Smith	2019-03-01	2021-12-31
Mike Johnson	2017-11-01	2022-05-15
Emily Brown	2020-02-15	NULL
David Wilson	2019-07-01	2022-01-31

Q15.)



```
SELECT Name, Salary, GradeLevel
FROM Employees
NATURAL JOIN JobGrades;
```

Name	Salary	GradeLevel
David Wilson	85000.00	A
Emily Brown	80000.00	A
Mike Johnson	70000.00	A
Jane Smith	95000.00	A
John Doe	90000.00	A
David Wilson	85000.00	B
Emily Brown	80000.00	B
Mike Johnson	70000.00	B
Jane Smith	95000.00	B
John Doe	90000.00	B
David Wilson	85000.00	C
Emily Brown	80000.00	C
Mike Johnson	70000.00	C
Jane Smith	95000.00	C
John Doe	90000.00	C
David Wilson	85000.00	D
Emily Brown	80000.00	D
Mike Johnson	70000.00	D
Jane Smith	95000.00	D