VIJAY R

Superset ID:5371616

Saveetha Engineering College
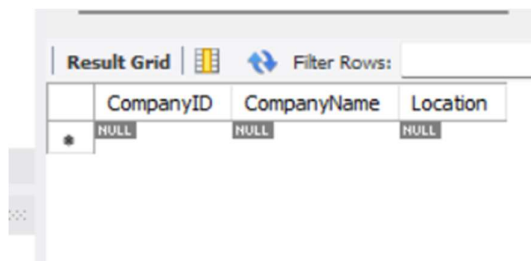
Coding Challenges: CareerHub, The Job Board

Tasks:

1. Provide a SQL script that initializes the database for the Job Board scenario "CareerHub".

```
CREATE DATABASE CareerHub;
USE CareerHub;
```

2. Create tables for Companies, Jobs, Applicants and Applications.

3. Define appropriate primary keys, foreign keys, and constraints.

```
CREATE TABLE Companies (
    CompanyID INT PRIMARY KEY AUTO_INCREMENT,
    CompanyName VARCHAR(255) NOT NULL,
    Location VARCHAR(255) NOT NULL
);
```



```
CREATE TABLE Jobs (
    JobID INT PRIMARY KEY AUTO_INCREMENT,
    CompanyID INT NOT NULL,
```

JobTitle VARCHAR(255) NOT NULL,

JobDescription TEXT NOT NULL,

JobLocation VARCHAR(255) NOT NULL,

Salary DECIMAL(10,2) NOT NULL,

JobType ENUM('Full-time', 'Part-time', 'Contract') NOT NULL,

PostedDate DATE NOT NULL,

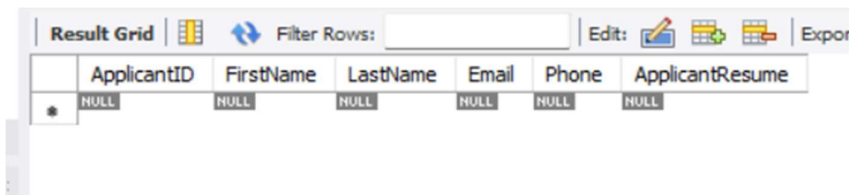FOREIGN KEY (CompanyID) REFERENCES Companies(CompanyID) ON DELETE CASCADE

);

JobID	CompanyID	JobTitle	JobDescription	JobLocation	Salary	JobType	PostedDate
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

CREATE TABLE Applicants (

    ApplicantID INT PRIMARY KEY AUTO_INCREMENT,

    FirstName VARCHAR(100) NOT NULL,

    LastName VARCHAR(100) NOT NULL,

    Email VARCHAR(255) UNIQUE NOT NULL,

    Phone VARCHAR(20) UNIQUE NOT NULL,

    ApplicantResume TEXT NOT NULL

);

ApplicantID	FirstName	LastName	Email	Phone	ApplicantResume
NULL	NULL	NULL	NULL	NULL	NULL

CREATE TABLE Applications (

    ApplicationID INT PRIMARY KEY AUTO_INCREMENT,

    JobID INT NOT NULL,

ApplicantID INT NOT NULL,

ApplicationDate DATE NOT NULL,

CoverLetter TEXT NOT NULL,

FOREIGN KEY (JobID) REFERENCES Jobs(JobID) ON DELETE CASCADE,

FOREIGN KEY (ApplicantID) REFERENCES Applicants(ApplicantID) ON DELETE CASCADE

);

ApplicationID	JobID	ApplicantID	ApplicationDate	CoverLetter
NULL	NULL	NULL	NULL	NULL

INSERT INTO Companies (CompanyName, Location) VALUES

('Tata Consultancy Services', 'Mumbai, India'),

('Google', 'Mountain View, USA'),

('Infosys', 'Bangalore, India'),

('Amazon', 'Seattle, USA'),

('HCL Technologies', 'Noida, India'),

('Microsoft', 'Redmond, USA'),

('Accenture', 'Dublin, Ireland'),

('Capgemini', 'Paris, France'),

('Wipro', 'Hyderabad, India'),

('IBM', 'New York, USA');

CompanyID	CompanyName	Location
1	Tata Consultancy Services	Mumbai, India
2	Google	Mountain View, USA
3	Infosys	Bangalore, India
4	Amazon	Seattle, USA
5	HCL Technologies	Noida, India
6	Microsoft	Redmond, USA
7	Accenture	Dublin, Ireland
8	Capgemini	Paris, France
9	Wipro	Hyderabad, India
10	IBM	New York, USA
NULL	NULL	NULL

INSERT INTO Jobs (CompanyID, JobTitle, JobDescription, JobLocation, Salary, JobType, PostedDate) VALUES

(1, 'Software Engineer', 'Develop web applications', 'Mumbai, India', 1200000.00, 'Full-time', '2024-11-10'),

(2, 'Data Scientist', 'Analyze large datasets', 'Mountain View, USA', 150000.00, 'Full-time', '2024-12-05'),

(3, 'System Analyst', 'Optimize IT systems', 'Bangalore, India', 1000000.00, 'Full-time', '2024-12-20'),

(4, 'Cloud Architect', 'Design cloud solutions', 'Seattle, USA', 170000.00, 'Full-time', '2025-01-08'),

(5, 'Cybersecurity Specialist', 'Ensure system security', 'Noida, India', 1100000.00, 'Full-time', '2025-01-25'),
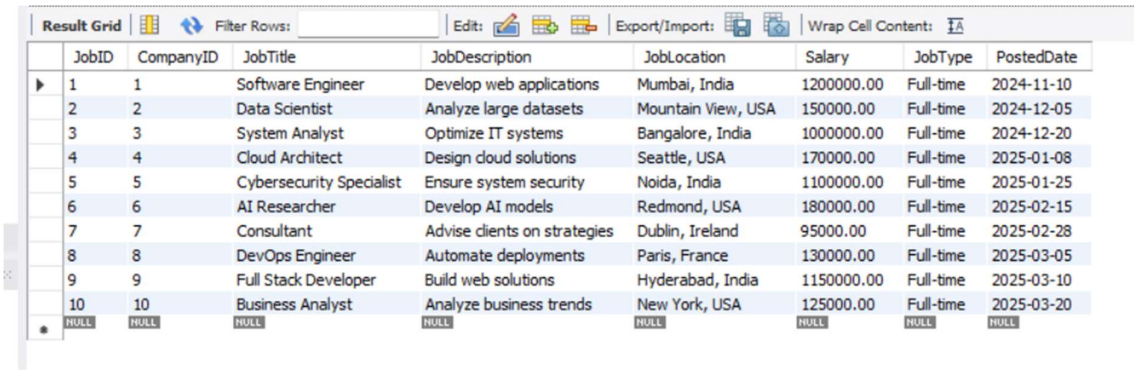
(6, 'AI Researcher', 'Develop AI models', 'Redmond, USA', 180000.00, 'Full-time', '2025-02-15'),

(7, 'Consultant', 'Advise clients on strategies', 'Dublin, Ireland', 95000.00, 'Full-time', '2025-02-28'),

(8, 'DevOps Engineer', 'Automate deployments', 'Paris, France', 130000.00, 'Full-time', '2025-03-05'),

(9, 'Full Stack Developer', 'Build web solutions', 'Hyderabad, India', 1150000.00, 'Full-time', '2025-03-10'),

(10, 'Business Analyst', 'Analyze business trends', 'New York, USA', 125000.00, 'Full-time', '2025-03-20');

Result Grid		Filter Rows:		Edit:			Export/Import:			Wrap Cell Content:	
	JobID	CompanyID	JobTitle	JobDescription	JobLocation	Salary	JobType	PostedDate
▶	1	1	Software Engineer	Develop web applications	Mumbai, India	1200000.00	Full-time	2024-11-10
	2	2	Data Scientist	Analyze large datasets	Mountain View, USA	150000.00	Full-time	2024-12-05
	3	3	System Analyst	Optimize IT systems	Bangalore, India	1000000.00	Full-time	2024-12-20
	4	4	Cloud Architect	Design cloud solutions	Seattle, USA	170000.00	Full-time	2025-01-08
	5	5	Cybersecurity Specialist	Ensure system security	Noida, India	1100000.00	Full-time	2025-01-25
	6	6	AI Researcher	Develop AI models	Redmond, USA	180000.00	Full-time	2025-02-15
	7	7	Consultant	Advise clients on strategies	Dublin, Ireland	95000.00	Full-time	2025-02-28
	8	8	DevOps Engineer	Automate deployments	Paris, France	130000.00	Full-time	2025-03-05
	9	9	Full Stack Developer	Build web solutions	Hyderabad, India	1150000.00	Full-time	2025-03-10
	10	10	Business Analyst	Analyze business trends	New York, USA	125000.00	Full-time	2025-03-20
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

INSERT INTO Applicants (FirstName, LastName, Email, Phone, ApplicantResume) VALUES

('Ravi', 'Kumar', 'ravi.kumar@email.com', '+91 9876543210', 'Experienced software developer...'),

('John', 'Smith', 'john.smith@email.com', '+1 1234567890', 'Expert in machine learning...'),

('Ayesha', 'Fatima', 'ayesha.fatima@email.com', '+91 8765432109', 'Python backend developer...'),

('Emily', 'Johnson', 'emily.johnson@email.com', '+1 2345678901', 'Cloud engineer with AWS certification...'),

('Vikram', 'Singh', 'vikram.singh@email.com', '+91 7654321098', 'Data scientist with deep learning expertise...'),

('Michael', 'Brown', 'michael.brown@email.com', '+1 3456789012', 'Cybersecurity expert with 5 years of experience...'),

('Sanjana', 'Reddy', 'sanjana.reddy@email.com', '+91 6543210987', 'Web developer proficient in React and Node.js...'),

('Lucas', 'Martinez', 'lucas.martinez@email.com', '+33 4567890123', 'Business consultant with international experience...'),

('Neha', 'Sharma', 'neha.sharma@email.com', '+91 5432109876', 'DevOps engineer skilled in Kubernetes and Docker...'),

('Sophia', 'Williams', 'sophia.williams@email.com', '+1 4567890123', 'Experienced business analyst in fintech domain...');

ApplicantID	FirstName	LastName	Email	Phone	ApplicantResume
1	Ravi	Kumar	ravi.kumar@email.com	+91 9876543210	Experienced software developer...
2	John	Smith	john.smith@email.com	+1 1234567890	Expert in machine learning...
3	Ayesha	Fatima	ayesha.fatima@email.com	+91 8765432109	Python backend developer...
4	Emily	Johnson	emily.johnson@email.com	+1 2345678901	Cloud engineer with AWS certification...
5	Vikram	Singh	vikram.singh@email.com	+91 7654321098	Data scientist with deep learning expertise...
6	Michael	Brown	michael.brown@email.com	+1 3456789012	Cybersecurity expert with 5 years of experienc...
7	Sanjana	Reddy	sanjana.reddy@email.com	+91 6543210987	Web developer proficient in React and Node.js...
8	Lucas	Martinez	lucas.martinez@email.com	+33 4567890123	Business consultant with international experienc...
9	Neha	Sharma	neha.sharma@email.com	+91 5432109876	DevOps engineer skilled in Kubernetes and Dock...
10	Sophia	Williams	sophia.williams@email.com	+1 4567890123	Experienced business analyst in fintech domain...
NULL	NULL	NULL	NULL	NULL	NULL

INSERT INTO Applications (JobID, ApplicantID, ApplicationDate, CoverLetter) VALUES

(1, 1, '2024-11-12', 'I am excited to apply for this software engineer position...'),

(2, 2, '2024-12-07', 'Data science is my passion, and I look forward to contributing...'),

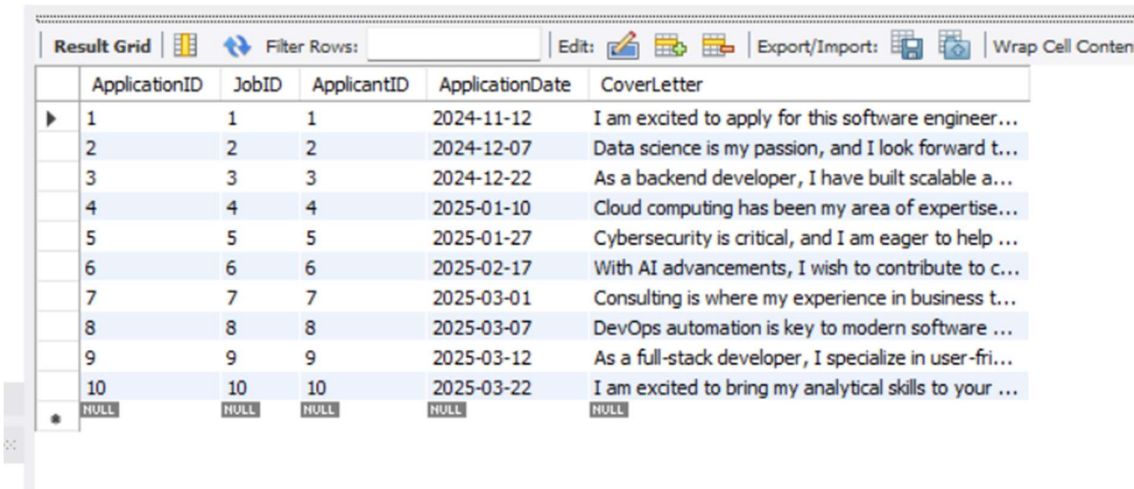(3, 3, '2024-12-22', 'As a backend developer, I have built scalable applications...'),

(4, 4, '2025-01-10', 'Cloud computing has been my area of expertise for years...'),

(5, 5, '2025-01-27', 'Cybersecurity is critical, and I am eager to help strengthen systems...'),

(6, 6, '2025-02-17', 'With AI advancements, I wish to contribute to cutting-edge research...'),

(7, 7, '2025-03-01', 'Consulting is where my experience in business transformation fits best...'),

(8, 8, '2025-03-07', 'DevOps automation is key to modern software development, and I excel at it...'),

(9, 9, '2025-03-12', 'As a full-stack developer, I specialize in user-friendly applications...'),

(10, 10, '2025-03-22', 'I am excited to bring my analytical skills to your business strategy team...');

	ApplicationID	JobID	ApplicantID	ApplicationDate	CoverLetter
▶	1	1	1	2024-11-12	I am excited to apply for this software engineer...
	2	2	2	2024-12-07	Data science is my passion, and I look forward t...
	3	3	3	2024-12-22	As a backend developer, I have built scalable a...
	4	4	4	2025-01-10	Cloud computing has been my area of expertise...
	5	5	5	2025-01-27	Cybersecurity is critical, and I am eager to help ...
	6	6	6	2025-02-17	With AI advancements, I wish to contribute to c...
	7	7	7	2025-03-01	Consulting is where my experience in business t...
	8	8	8	2025-03-07	DevOps automation is key to modern software ...
	9	9	9	2025-03-12	As a full-stack developer, I specialize in user-fri...
	10	10	10	2025-03-22	I am excited to bring my analytical skills to your ...
*	NULL	NULL	NULL	NULL	NULL

4. Ensure the script handles potential errors, such as if the database or tables already exist.

```
100  15:36:54  CREATE TABLE Companies (   CompanyID INT PRIMARY KEY AUTO_INCREMENT,   CompanyName VA...   Error Code: 1050. Table 'companies' already exists
```

5. Write an SQL query to count the number of applications received for each job listing in the "Jobs" table. Display the job title and the corresponding application count. Ensure that it lists all jobs, even if they have no applications.

SELECT j.JobTitle, COUNT(a.ApplicationID) AS ApplicationCount

FROM Jobs j

LEFT JOIN Applications a ON j.JobID = a.JobID

GROUP BY j.JobID, j.JobTitle;

	JobTitle	ApplicationCount
▶	Software Engineer	1
	Data Scientist	1
	System Analyst	1
	Cloud Architect	1
	Cybersecurity Specialist	1
	AI Researcher	1
	Consultant	1
	DevOps Engineer	1
	Full Stack Developer	1
	Business Analyst	1

6. Develop an SQL query that retrieves job listings from the "Jobs" table within a specified salary range. Allow parameters for the minimum and maximum salary values. Display the job title, company name, location, and salary for each matching job.

SELECT j.JobTitle, c.CompanyName, j.JobLocation, j.Salary

FROM Jobs j

JOIN Companies c ON j.CompanyID = c.CompanyID

WHERE j.Salary BETWEEN '95000.00' AND '130000.00';

Result Grid | Filter Rows: | Export: | Wrap C

|	JobTitle	CompanyName	JobLocation	Salary
▶	Consultant	Accenture	Dublin, Ireland	95000.00
	DevOps Engineer	Capgemini	Paris, France	130000.00
	Business Analyst	IBM	New York, USA	125000.00

7. Write an SQL query that retrieves the job application history for a specific applicant. Allow a parameter for the ApplicantID, and return a result set with the job titles, company names, and application dates for all the jobs the applicant has applied to.

SELECT j.JobTitle, c.CompanyName, a.ApplicationDate

FROM Applications a

JOIN Jobs j ON a.JobID = j.JobID

JOIN Companies c ON j.CompanyID = c.CompanyID

WHERE a.ApplicantID = 3;

8. Create an SQL query that calculates and displays the average salary offered by all companies for job listings in the "Jobs" table. Ensure that the query filters out jobs with a salary of zero.

SELECT AVG(Salary) AS AverageSalary

FROM Jobs

WHERE Salary > 0;

9. Write an SQL query to identify the company that has posted the most job listings. Display the company name along with the count of job listings they have posted. Handle ties if multiple companies have the same maximum count.

SELECT c.CompanyName, COUNT(j.JobID) AS JobCount

FROM Companies c

JOIN Jobs j ON c.CompanyID = j.CompanyID

GROUP BY c.CompanyID, c.CompanyName

HAVING COUNT(j.JobID) = (

   SELECT MAX(JobCount)

   FROM (SELECT COUNT(JobID) AS JobCount FROM Jobs GROUP BY CompanyID) AS JobCounts

);

CompanyName	JobCount
Wipro	1
Tata Consultancy Services	1
Microsoft	1
Infosys	1
IBM	1
HCL Technologies	1
Google	1
Capgemini	1
Amazon	1
Accenture	1

10. Find the applicants who have applied for positions in companies located in 'CityX' and have at least 3 years of experience.

ALTER TABLE Applicants ADD COLUMN ExperienceYears INT NOT NULL DEFAULT 0;

SET SQL_SAFE_UPDATES = 0;

UPDATE Applicants

SET ExperienceYears = CASE

   WHEN ApplicantID = 1 THEN 5

   WHEN ApplicantID = 2 THEN 2

   WHEN ApplicantID = 3 THEN 4

   WHEN ApplicantID = 4 THEN 1

   WHEN ApplicantID = 5 THEN 6

   WHEN ApplicantID = 6 THEN 3

   WHEN ApplicantID = 7 THEN 7

   WHEN ApplicantID = 8 THEN 2

   WHEN ApplicantID = 9 THEN 5

   WHEN ApplicantID = 10 THEN 8

END;

SELECT a.FirstName, a.LastName, c.CompanyName, c.Location, a.ExperienceYears
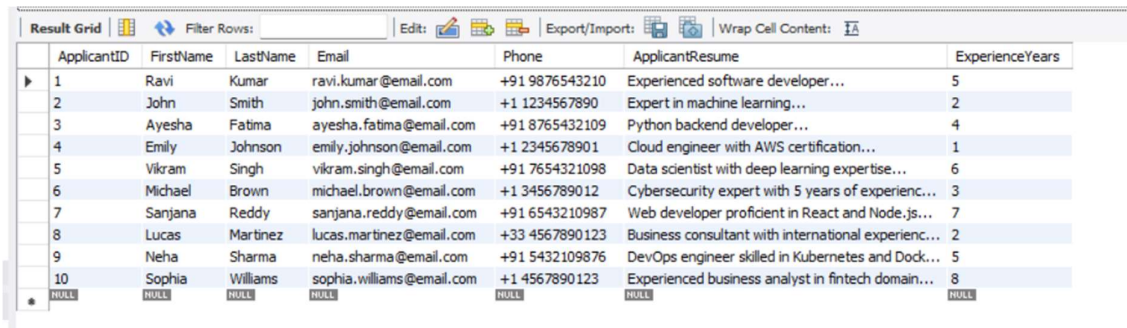
FROM Applications app

JOIN Jobs j ON app.JobID = j.JobID

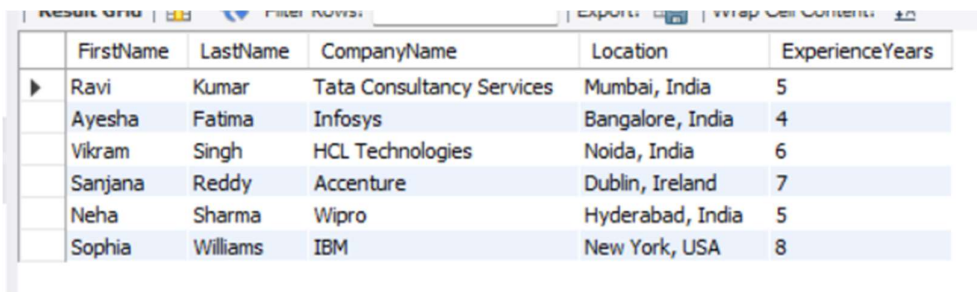JOIN Companies c ON j.CompanyID = c.CompanyID

JOIN Applicants a ON app.ApplicantID = a.ApplicantID

WHERE c.Location IN ('Mumbai, India', 'Mountain View, USA', 'Bangalore, India',

'Seattle, USA', 'Noida, India', 'Redmond, USA',

'Dublin, Ireland', 'Paris, France', 'Hyderabad, India', 'New York, USA')

AND a.ExperienceYears > 3;

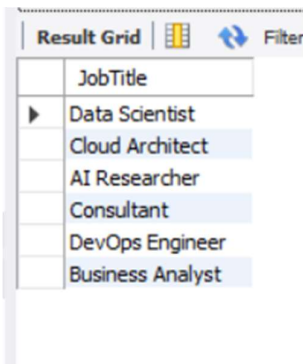| ApplicantID	FirstName	LastName	Email	Phone	ApplicantResume	ExperienceYears
1	Ravi	Kumar	ravi.kumar@email.com	+91 9876543210	Experienced software developer...	5
2	John	Smith	john.smith@email.com	+1 1234567890	Expert in machine learning...	2
3	Ayesha	Fatima	ayesha.fatima@email.com	+91 8765432109	Python backend developer...	4
4	Emily	Johnson	emily.johnson@email.com	+1 2345678901	Cloud engineer with AWS certification...	1
5	Vikram	Singh	vikram.singh@email.com	+91 7654321098	Data scientist with deep learning expertise...	6
6	Michael	Brown	michael.brown@email.com	+1 3456789012	Cybersecurity expert with 5 years of experienc...	3
7	Sanjana	Reddy	sanjana.reddy@email.com	+91 6543210987	Web developer proficient in React and Node.js...	7
8	Lucas	Martinez	lucas.martinez@email.com	+33 4567890123	Business consultant with international experienc...	2
9	Neha	Sharma	neha.sharma@email.com	+91 5432109876	DevOps engineer skilled in Kubernetes and Dock...	5
10	Sophia	Williams	sophia.williams@email.com	+1 4567890123	Experienced business analyst in fintech domain...	8
NULL	NULL	NULL	NULL	NULL	NULL	NULL

FirstName	LastName	CompanyName	Location	ExperienceYears
Ravi	Kumar	Tata Consultancy Services	Mumbai, India	5
Ayesha	Fatima	Infosys	Bangalore, India	4
Vikram	Singh	HCL Technologies	Noida, India	6
Sanjana	Reddy	Accenture	Dublin, Ireland	7
Neha	Sharma	Wipro	Hyderabad, India	5
Sophia	Williams	IBM	New York, USA	8

11. Retrieve a list of distinct job titles with salaries between $60,000 and $80,000.
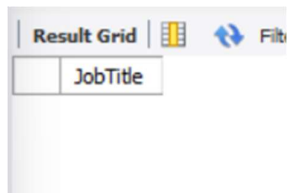
SELECT DISTINCT JobTitle

FROM Jobs

WHERE Salary BETWEEN 60000 AND 800000;

JobTitle
Data Scientist
Cloud Architect
AI Researcher
Consultant
DevOps Engineer
Business Analyst

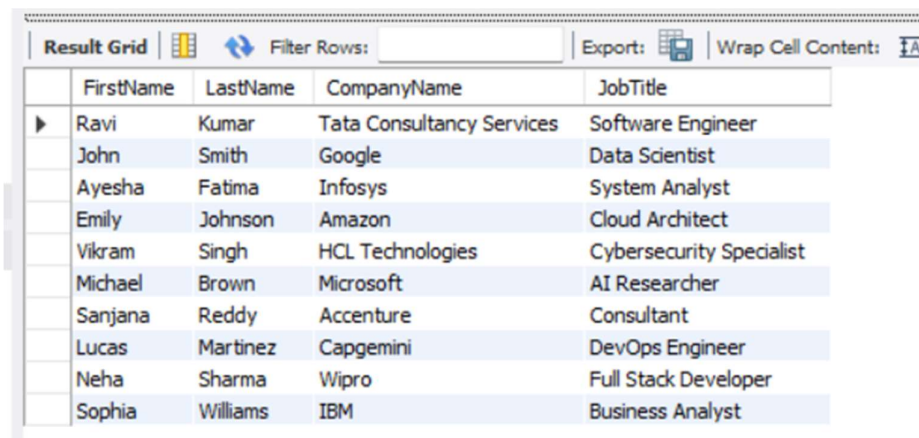12. Find the jobs that have not received any applications.

SELECT j.JobTitle

FROM Jobs j

LEFT JOIN Applications a ON j.JobID = a.JobID

WHERE a.ApplicationID IS NULL;

Result Grid	Filt
JobTitle

13. Retrieve a list of job applicants along with the companies they have applied to and the positions they have applied for.
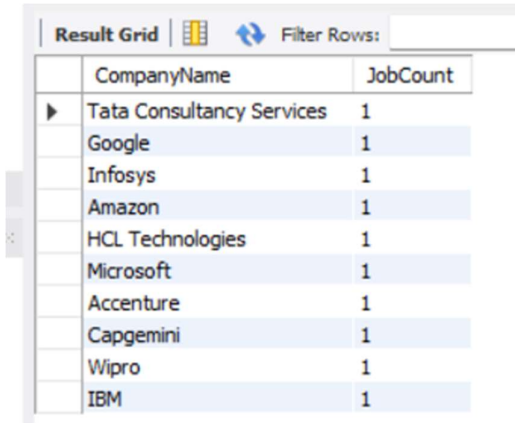
SELECT a.FirstName, a.LastName, c.CompanyName, j.JobTitle

FROM Applications app

JOIN Applicants a ON app.ApplicantID = a.ApplicantID

JOIN Jobs j ON app.JobID = j.JobID

JOIN Companies c ON j.CompanyID = c.CompanyID;

FirstName	LastName	CompanyName	JobTitle
Ravi	Kumar	Tata Consultancy Services	Software Engineer
John	Smith	Google	Data Scientist
Ayesha	Fatima	Infosys	System Analyst
Emily	Johnson	Amazon	Cloud Architect
Vikram	Singh	HCL Technologies	Cybersecurity Specialist
Michael	Brown	Microsoft	AI Researcher
Sanjana	Reddy	Accenture	Consultant
Lucas	Martinez	Capgemini	DevOps Engineer
Neha	Sharma	Wipro	Full Stack Developer
Sophia	Williams	IBM	Business Analyst

14. Retrieve a list of companies along with the count of jobs they have posted, even if they have not received any applications.

SELECT c.CompanyName, COUNT(j.JobID) AS JobCount

FROM Companies c

LEFT JOIN Jobs j ON c.CompanyID = j.CompanyID

GROUP BY c.CompanyID, c.CompanyName;

CompanyName	JobCount
Tata Consultancy Services	1
Google	1
Infosys	1
Amazon	1
HCL Technologies	1
Microsoft	1
Accenture	1
Capgemini	1
Wipro	1
IBM	1

15. List all applicants along with the companies and positions they have applied for, including those who have not applied.

SELECT a.FirstName, a.LastName, COALESCE(c.CompanyName, 'No Applications') AS Company,

    COALESCE(j.JobTitle, 'No Applications') AS JobTitle

FROM Applicants a

LEFT JOIN Applications app ON a.ApplicantID = app.ApplicantID

LEFT JOIN Jobs j ON app.JobID = j.JobID

LEFT JOIN Companies c ON j.CompanyID = c.CompanyID;

FirstName	LastName	Company	JobTitle
Ravi	Kumar	Tata Consultancy Services	Software Engineer
John	Smith	Google	Data Scientist
Ayesha	Fatima	Infosys	System Analyst
Emily	Johnson	Amazon	Cloud Architect
Vikram	Singh	HCL Technologies	Cybersecurity Specialist
Michael	Brown	Microsoft	AI Researcher
Sanjana	Reddy	Accenture	Consultant
Lucas	Martinez	Capgemini	DevOps Engineer
Neha	Sharma	Wipro	Full Stack Developer
Sophia	Williams	IBM	Business Analyst

16. Find companies that have posted jobs with a salary higher than the average salary of all jobs.

SELECT DISTINCT c.CompanyName

FROM Companies c

JOIN Jobs j ON c.CompanyID = j.CompanyID

WHERE j.Salary > (SELECT AVG(Salary) FROM Jobs WHERE Salary > 0);

CompanyName
Tata Consultancy Services
Infosys
HCL Technologies
Wipro

17. Display a list of applicants with their names and a concatenated string of their city and state.

SELECT a.FirstName, a.LastName, CONCAT(c.Location) AS FullAddress

FROM Applicants a

JOIN Applications app ON a.ApplicantID = app.ApplicantID

JOIN Jobs j ON app.JobID = j.JobID

JOIN Companies c ON j.CompanyID = c.CompanyID;

FirstName	LastName	FullAddress
► Ravi	Kumar	Mumbai, India
John	Smith	Mountain View, USA
Ayesha	Fatima	Bangalore, India
Emily	Johnson	Seattle, USA
Vikram	Singh	Noida, India
Michael	Brown	Redmond, USA
Sanjana	Reddy	Dublin, Ireland
Lucas	Martinez	Paris, France
Neha	Sharma	Hyderabad, India
Sophia	Williams	New York, USA

18. Retrieve a list of jobs with titles containing either 'Developer' or 'Engineer'.

SELECT JobTitle

FROM Jobs

WHERE JobTitle LIKE 'Full Stack Developer' OR JobTitle LIKE 'Software Engineer';

Result Grid | Filter Rows:

JobTitle
► Software Engineer
Full Stack Developer

19. Retrieve a list of applicants and the jobs they have applied for, including those who have not applied and jobs without applicants.

SELECT a.FirstName, a.LastName, COALESCE(j.JobTitle, 'No Job Applied') AS JobTitle

FROM Applicants a

LEFT JOIN Applications app ON a.ApplicantID = app.ApplicantID

LEFT JOIN Jobs j ON app.JobID = j.JobID;

FirstName	LastName	JobTitle
Ravi	Kumar	Software Engineer
John	Smith	Data Scientist
Ayesha	Fatima	System Analyst
Emily	Johnson	Cloud Architect
Vikram	Singh	Cybersecurity Specialist
Michael	Brown	AI Researcher
Sanjana	Reddy	Consultant
Lucas	Martinez	DevOps Engineer
Neha	Sharma	Full Stack Developer
Sophia	Williams	Business Analyst

20. List all combinations of applicants and companies where the company is in a specific city and the applicant has more than 2 years of experience. For example: city=Chennai.

SELECT a.FirstName, a.LastName, c.CompanyName, c.Location

FROM Applicants a

CROSS JOIN Companies c

WHERE c.Location IN ('Hyderabad, India')

AND a.ExperienceYears > 2;

FirstName	LastName	CompanyName	Location
Ravi	Kumar	Wipro	Hyderabad, India
Ayesha	Fatima	Wipro	Hyderabad, India
Vikram	Singh	Wipro	Hyderabad, India
Michael	Brown	Wipro	Hyderabad, India
Sanjana	Reddy	Wipro	Hyderabad, India
Neha	Sharma	Wipro	Hyderabad, India
Sophia	Williams	Wipro	Hyderabad, India