

Coding Challenge 2 - Answers

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

- `create database Careerhub;`
- `show databases;`
- `use Careerhub;`

2. Create tables for Companies, Jobs, Applicants and Applications. Define appropriate primary keys, foreign keys, and constraints.

- `use Careerhub;`
- `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,
 FOREIGN KEY (CompanyID) REFERENCES Companies(CompanyID),
 JobTitle VARCHAR(255) NOT NULL,
 JobDescription TEXT NOT NULL,
 JobLocation VARCHAR(255) NOT NULL,
 Salary DECIMAL(10,2),
 JobType VARCHAR(50) NOT NULL,
 PostedDate DATETIME NOT NULL DEFAULT CURRENT_TIMESTAMP
);`
- `CREATE TABLE Applicants (
 ApplicantID INT PRIMARY KEY AUTO_INCREMENT,
 FirstName VARCHAR(255) NOT NULL,
 LastName VARCHAR(255) NOT NULL,
 Email VARCHAR(255) NOT NULL UNIQUE,
 Phone VARCHAR(20),
 Resume TEXT
);`

```

• CREATE TABLE Applications (
    ApplicationID INT PRIMARY KEY AUTO_INCREMENT,
    JobID INT NOT NULL,
    ApplicantID INT NOT NULL,
    FOREIGN KEY (JobID) REFERENCES Jobs(JobID),
    FOREIGN KEY (ApplicantID) REFERENCES Applicants(ApplicantID),
    ApplicationDate DATETIME NOT NULL DEFAULT CURRENT_TIMESTAMP,
    CoverLetter TEXT
);

```

4. 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.

```

96 • SELECT j.JobTitle, COUNT(a.ApplicationID) AS ApplicationCount
97 FROM Jobs j
98 LEFT JOIN Applications a ON j.JobID = a.JobID
99 GROUP BY j.JobTitle
100 ORDER BY j.JobTitle;

```

JobTitle	ApplicationCount
Content Writer	1
Data Scientist	1
Design Engineer	1
Graphic Designer	1
Human Resources Manager	1
Marketing Manager	1
Product Manager	1
Sales Representative	1
Software Developer	1
Software Engineer	1

5. 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.

```

104 • SELECT j.JobTitle, c.CompanyName, j.JobLocation, j.Salary
105 FROM Jobs j
106 INNER JOIN Companies c ON j.CompanyID = c.CompanyID
107 WHERE j.Salary >= 50000.00 AND j.Salary <= 100000.00
108 ORDER BY j.JobTitle;

```

JobTitle	CompanyName	JobLocation	Salary
Content Writer	Netflix	Los Gatos, CA	60000.00
Graphic Designer	Adobe	San Jose, CA	50000.00
Human Resources Manager	Meta Platforms	Menlo Park, CA	80000.00
Marketing Manager	Apple	Cupertino, CA	100000.00
Sales Representative	Salesforce	San Francisco, CA	70000.00
Software Developer	Nvidia	Santa Clara, CA	90000.00

6. 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.

```

110 • SELECT j.JobTitle, c.CompanyName, ap.ApplicationDate
111 FROM Applicants a
112 INNER JOIN Applications ap ON a.ApplicantID = ap.ApplicantID
113 INNER JOIN Jobs j ON ap.JobID = j.JobID
114 INNER JOIN Companies c ON j.CompanyID = c.CompanyID
115 WHERE a.ApplicantID = 7
116 ORDER BY ap.ApplicationDate;

```

JobTitle	CompanyName	ApplicationDate
Content Writer	Netflix	2023-10-29 00:00:00

7. 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.

```

118 • SELECT AVG(Salary) AS AverageSalary
119 FROM Jobs
120 WHERE Salary > 0;

```

AverageSalary
96000.000000

8. 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.

```

122 • SELECT c.CompanyName, COUNT(*) AS JobCount
123 FROM Jobs j
124 INNER JOIN Companies c ON j.CompanyID = c.CompanyID
125 GROUP BY c.CompanyName
126 HAVING JobCount = (
127     SELECT MAX(JobCount)
128     FROM (
129         SELECT c.CompanyName, COUNT(*) AS JobCount
130         FROM Jobs j
131         INNER JOIN Companies c ON j.CompanyID = c.CompanyID
132         GROUP BY c.CompanyName
133     ) AS Subquery
134 );

```

CompanyName	JobCount
Google	1
Amazon	1
Microsoft	1
Apple	1
Meta Platforms	1
Tesla	1
Netflix	1
Nvidia	1
Salesforce	1
Adobe	1

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

```
• SELECT a.ApplicantID, a.FirstName, a.LastName, j.JobTitle, c.CompanyName
  FROM Applicants a
 INNER JOIN Applications ap ON a.ApplicantID = ap.ApplicantID
 INNER JOIN Jobs j ON ap.JobID = j.JobID
 INNER JOIN Companies c ON j.CompanyID = c.CompanyID
 WHERE c.Location = 'Los Gatos, CA'
 AND (
   -- Calculate and compare applicant experience here
   -- e.g., (YEAR(CURDATE()) - YEAR(a.StartDate)) >= 3
   -- or based on a dedicated experience field
   a.Experience >= 3
 )
 ORDER BY a.LastName;
```

10. Retrieve a list of distinct job titles with salaries between \$60,000 and \$80,000.

```
151 • SELECT DISTINCT j.JobTitle
152   FROM Jobs j
153  WHERE j.Salary BETWEEN 60000.00 AND 80000.00
154  ORDER BY j.JobTitle;
```

Result Grid	Filter Rows:	Exports	Wrap Cell Content:
JobTitle			
Content Writer			
Human Resources Manager			
Sales Representative			

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

```
156 • SELECT j.JobTitle
157   FROM Jobs j
158  LEFT JOIN Applications a ON j.JobID = a.JobID
159  WHERE a.JobID IS NULL
160  ORDER BY j.JobTitle;
```

Result Grid	Filter Rows:	Exports	Wrap Cell Content:
JobTitle			

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

```
169 • SELECT c.CompanyName, COUNT(j.JobID) AS JobCount
170 FROM Companies c
171 LEFT JOIN Jobs j ON c.CompanyID = j.CompanyID
172 GROUP BY c.CompanyName
173 ORDER BY JobCount DESC;
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
CompanyName	JobCount		
Google	1		
Amazon	1		
Microsoft	1		
Apple	1		
Meta Platforms	1		
Tesla	1		
Netflix	1		
Nvidia	1		
Salesforce	1		
Adobe	1		

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

```
182 • SELECT c.CompanyName
183 FROM Companies c
184 INNER JOIN Jobs j ON c.CompanyID = j.CompanyID
185 WHERE j.Salary > (
186     SELECT AVG(Salary)
187     FROM Jobs
188 );
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
CompanyName			
Google			
Amazon			
Microsoft			
Apple			
Tesla			

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

```
• SELECT CONCAT(FirstName, ' ', LastName) AS FullName, CONCAT(City, ', ', State) AS Location
FROM Applicants;
```

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

```
193 • SELECT JobTitle
194 FROM Jobs
195 WHERE JobTitle LIKE '%Developer%'
196 OR JobTitle LIKE '%Engineer%';
```

Result Grid	Filter Rows:	Export:	Wrap Cell C
JobTitle			
Software Engineer			
Design Engineer			
Software Developer			





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

```
198 • SELECT a.FirstName, a.LastName, j.JobTitle, c.CompanyName
199 FROM Applicants a
200 LEFT JOIN Applications ap ON a.ApplicantID = ap.ApplicantID
201 LEFT JOIN Jobs j ON ap.JobID = j.JobID
202 LEFT JOIN Companies c ON j.CompanyID = c.CompanyID
203 ORDER BY a.LastName, COALESCE(j.JobTitle, 'No Applications'), c.CompanyName;
```

Result Grid	Filter Rows:	Export:	Wrap Cell Contents: I A
Firstname	Lastname	JobTitle	CompanyName
Emily	Brown	Design Engineer	Tesla
Jane	Doe	Data Scientist	Amazon
John	Doe	Software Engineer	Google
Elizabeth	Johnson	Graphic Designer	Adobe
Sarah	Jones	Marketing Manager	Apple
Robert	Lewis	Sales Representative	Salesforce
Michael	Smith	Product Manager	Microsoft
Matthew	Taylor	Content Writer	Netflix
David	Williams	Human Resources Manager	Meta Platforms
Jennifer	Wilson	Software Developer	Nvidia

17. 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 = Los Gatos, CA

```
205 • SELECT a.FirstName, a.LastName, c.CompanyName
206 FROM Applicants a
207 INNER JOIN Applications ap ON a.ApplicantID = ap.ApplicantID
208 INNER JOIN Jobs j ON ap.JobID = j.JobID
209 INNER JOIN Companies c ON j.CompanyID = c.CompanyID
210 WHERE c.Location = 'Los Gatos, CA'
211
```

Result Grid		 Filter Rows: <input type="text"/>	Export: 	Wrap Cell Content: 
▶	FirstName	LastName	CompanyName	
▶	Matthew	Taylor	Netflix	