

CODING CHALLENGES (case study 2)

NAME: HEMASHRI S

TITLE: CAREERHUB, THE JOB BOARD

drop database if exists CareerHub;

-- 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,

 CompanyName VARCHAR(200) NOT NULL,

 Location VARCHAR(200) NOT NULL

);

INSERT INTO Companies (CompanyID, CompanyName, Location) VALUES

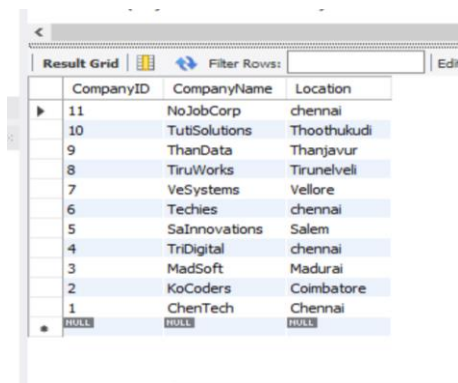
(1, 'ChenTech', 'Chennai'),

(2, 'KoCoders', 'Coimbatore'),

(3, 'MadSoft', 'Madurai'),

```
(4, 'TriDigital', 'chennai'),
(5, 'SaInnovations', 'Salem'),
(6, 'Techies', 'chennai'),
(7, 'VeSystems', 'Vellore'),
(8, 'TiruWorks', 'Tirunelveli'),
(9, 'ThanData', 'Thanjavur'),
(10, 'TutiSolutions', 'Thoothukudi');
```

```
select * from companies;
```



	CompanyID	CompanyName	Location
▶	11	NoJobCorp	chennai
	10	TutiSolutions	Thoothukudi
	9	ThanData	Thanjavur
	8	TiruWorks	Tirunelveli
	7	VeSystems	Vellore
	6	Techies	chennai
	5	SaInnovations	Salem
	4	TriDigital	chennai
	3	MadSoft	Madurai
	2	KoCoders	Coimbatore
	1	ChenTech	Chennai
✱	NULL	NULL	NULL

```
CREATE TABLE Jobs (
    JobID INT PRIMARY KEY,
    CompanyID INT NOT NULL,
    JobTitle VARCHAR(255) NOT NULL,
    JobDescription TEXT,
    JobLocation VARCHAR(255) NOT NULL,
    Salary DECIMAL(10, 2) check (salary >=0),
    JobType VARCHAR(100) CHECK (JOBTYPE IN ('Full-Time', 'Part-Time',
'Contract')),
    PostedDate DATETIME not null,
```

FOREIGN KEY (CompanyID) REFERENCES Companies(CompanyID)

);

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

(1, 1, 'Full Stack Developer', 'Develop front-end and back-end modules for web apps.', 'Chennai', 75000.00, 'Full-time', '2025-04-01 09:00:00'),

(2, 2, 'Data Analyst', 'Analyze sales and customer data for insights.', 'Coimbatore', 70000.00, 'Full-time', '2025-04-02 10:00:00'),

(3, 3, 'Technical Support', 'Provide customer technical support via chat and call.', 'Madurai', 48000.00, 'Part-time', '2025-04-03 11:00:00'),

(4, 4, 'UI/UX Designer', 'Create interactive and user-friendly designs.', 'chennai', 65000.00, 'Full-time', '2025-04-04 12:00:00'),

(5, 5, 'Backend Developer', 'Develop server-side application logic and APIs.', 'Salem', 80000.00, 'Full-time', '2025-04-05 13:00:00'),

(6, 6, 'Android app Developer', 'Build mobile apps using Kotlin and Java.', 'chennai', 72000.00, 'Contract', '2025-04-06 14:00:00'),

(7, 7, 'Quality Designer', 'Test software for bugs and ensure stability.', 'Vellore', 60000.00, 'Full-time', '2025-04-07 15:00:00'),

(8, 8, 'DevOps Engineer', 'Manage CI/CD pipelines and cloud infrastructure.', 'Tirunelveli', 85000.00, 'Full-time', '2025-04-08 16:00:00'),

(9, 9, 'machine learning engineer', 'Build and deploy ML models for predictions.', 'Thanjavur', 90000.00, 'Full-time', '2025-04-09 17:00:00'),

(10, 10, 'project manager', 'Oversee team deliverables and project timelines.', 'Thoothukudi', 95000.00, 'Full-time', '2025-04-10 18:00:00');

select * from jobs;

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Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content: |

JobID	CompanyID	JobTitle	JobDescription	JobLocation	Salary	JobType	PostedDate
1	1	Full Stack Developer	Develop front-end and back-end modules for w...	Chennai	75000.00	Full-time	2025-04-01 09:00:00
2	2	Data Analyst	Analyze sales and customer data for insights.	Coimbatore	70000.00	Full-time	2025-04-02 10:00:00
3	3	Technical Support	Provide customer technical support via chat and...	Madurai	48000.00	Part-time	2025-04-03 11:00:00
4	4	UI/UX Designer	Create interactive and user-friendly designs.	chennai	65000.00	Full-time	2025-04-04 12:00:00
5	5	Backend Developer	Develop server-side application logic and APIs.	Salem	80000.00	Full-time	2025-04-05 13:00:00
6	6	Android app Developer	Build mobile apps using Kotlin and Java.	chennai	72000.00	Contract	2025-04-06 14:00:00
7	7	Quality Designer	Test software for bugs and ensure stability.	Vellore	60000.00	Full-time	2025-04-07 15:00:00
8	8	DevOps Engineer	Manage CI/CD pipelines and cloud infrastructure.	Tirunelveli	85000.00	Full-time	2025-04-08 16:00:00
9	9	machine learning engineer	Build and deploy ML models for predictions.	Thanjavur	90000.00	Full-time	2025-04-09 17:00:00
10	10	project manager	Oversee team deliverables and project timelines.	Thoothukudi	95000.00	Full-time	2025-04-10 18:00:00
* NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

```
CREATE TABLE Applicants (
    ApplicantID INT PRIMARY KEY,
    FirstName VARCHAR(100) not null,
    LastName VARCHAR(100)not null,
    Email VARCHAR(255) unique not null,
    Phone VARCHAR(20),
    Resume TEXT
);
```

```
INSERT INTO Applicants (ApplicantID, FirstName, LastName, Email, Phone,
Resume) VALUES
(1, 'Arun', 'Kumar', 'arun.kumar@example.com', '9876543210', 'Resume of Arun
Kumar'),
(2, 'Divya', 'Ramesh', 'divya.ramesh@example.com', '9876543211', 'Resume of
Divya Ramesh'),
(3, 'Suresh', 'Ravi', 'suresh.ravi@example.com', '9876543212', 'Resume of Suresh
Ravi'),
```

(4, 'Meena', 'Lakshmi', 'meena.lakshmi@example.com', '9876543213', 'Resume of Meena Lakshmi'),

(5, 'Karthik', 'Mohan', 'karthik.mohan@example.com', '9876543214', 'Resume of Karthik Mohan'),

(6, 'Priya', 'Balan', 'priya.balan@example.com', '9876543215', 'Resume of Priya Balan'),

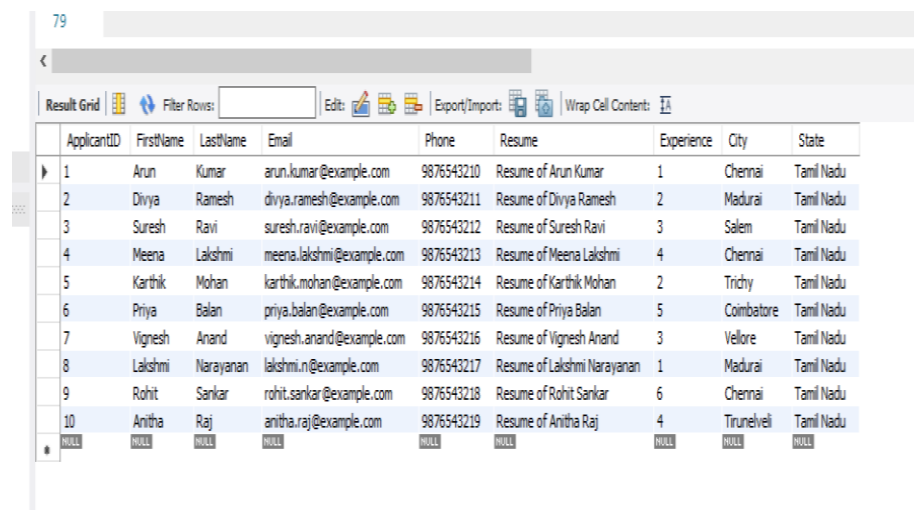
(7, 'Vignesh', 'Anand', 'vignesh.anand@example.com', '9876543216', 'Resume of Vignesh Anand'),

(8, 'Lakshmi', 'Narayanan', 'lakshmi.n@example.com', '9876543217', 'Resume of Lakshmi Narayanan'),

(9, 'Rohit', 'Sankar', 'rohit.sankar@example.com', '9876543218', 'Resume of Rohit Sankar'),

(10, 'Anitha', 'Raj', 'anitha.raj@example.com', '9876543219', 'Resume of Anitha Raj');

select * from applicants;



The screenshot shows a database application grid with 10 rows of data. The grid has columns for ApplicantID, First Name, Last Name, Email, Phone, Resume, Experience, City, and State. The data is as follows:

ApplicantID	First Name	Last Name	Email	Phone	Resume	Experience	City	State
1	Arun	Kumar	arun.kumar@example.com	9876543210	Resume of Arun Kumar	1	Chennai	Tamil Nadu
2	Divya	Ramesh	divya.ramesh@example.com	9876543211	Resume of Divya Ramesh	2	Madurai	Tamil Nadu
3	Suresh	Ravi	suresh.ravi@example.com	9876543212	Resume of Suresh Ravi	3	Salem	Tamil Nadu
4	Meena	Lakshmi	meena.lakshmi@example.com	9876543213	Resume of Meena Lakshmi	4	Chennai	Tamil Nadu
5	Karthik	Mohan	karthik.mohan@example.com	9876543214	Resume of Karthik Mohan	2	Trichy	Tamil Nadu
6	Priya	Balan	priya.balan@example.com	9876543215	Resume of Priya Balan	5	Coimbatore	Tamil Nadu
7	Vignesh	Anand	vignesh.anand@example.com	9876543216	Resume of Vignesh Anand	3	Vellore	Tamil Nadu
8	Lakshmi	Narayanan	lakshmi.n@example.com	9876543217	Resume of Lakshmi Narayanan	1	Madurai	Tamil Nadu
9	Rohit	Sankar	rohit.sankar@example.com	9876543218	Resume of Rohit Sankar	6	Chennai	Tamil Nadu
10	Anitha	Raj	anitha.raj@example.com	9876543219	Resume of Anitha Raj	4	Trirunelveli	Tamil Nadu

CREATE TABLE Applications (
ApplicationID INT PRIMARY KEY,
JobID INT not null,

```
ApplicantID INT not null,  
ApplicationDate DATETIME not null,  
CoverLetter TEXT,  
FOREIGN KEY (JobID) REFERENCES Jobs(JobID) on delete cascade,  
FOREIGN KEY (ApplicantID) REFERENCES Applicants(ApplicantID)  
);
```

```
INSERT INTO Applications (ApplicationID, JobID, ApplicantID,  
ApplicationDate, CoverLetter) VALUES  
(1, 1, 1, '2025-04-11 10:00:00', 'Cover letter from Arun Kumar'),  
(2, 1, 2, '2025-04-11 10:30:00', 'Cover letter from Divya Ramesh'),  
(3, 3, 3, '2025-04-11 11:00:00', 'Cover letter from Suresh Ravi'),  
(4, 2, 4, '2025-04-11 11:30:00', 'Cover letter from Meena Lakshmi'),  
(5, 6, 5, '2025-04-11 12:00:00', 'Cover letter from Karthik Mohan'),  
(6, 6, 6, '2025-04-11 12:30:00', 'Cover letter from Priya Balan'),  
(7, 7, 7, '2025-04-11 13:00:00', 'Cover letter from Vignesh Anand'),  
(8, 6, 8, '2025-04-11 13:30:00', 'Cover letter from Lakshmi Narayanan'),  
(9, 8, 9, '2025-04-11 14:00:00', 'Cover letter from Rohit Sankar'),  
(10, 10, 10, '2025-04-11 14:30:00', 'Cover letter from Anitha Raj');
```

```
select * from applications;
```

106 -- 5. Write an SQL query to count the number of applications received for i

ApplicationID	JobID	ApplicantID	ApplicationDate	CoverLetter
1	1	1	2025-04-11 10:00:00	Cover letter from Arun Kumar
2	1	2	2025-04-11 10:30:00	Cover letter from Divya Ramesh
3	3	3	2025-04-11 11:00:00	Cover letter from Suresh Ravi
4	2	4	2025-04-11 11:30:00	Cover letter from Meena Lakshmi
5	6	5	2025-04-11 12:00:00	Cover letter from Karthik Mohan
6	6	6	2025-04-11 12:30:00	Cover letter from Priya Balan
7	7	7	2025-04-11 13:00:00	Cover letter from Vignesh Anand
8	6	8	2025-04-11 13:30:00	Cover letter from Lakshmi Narayanan
9	8	9	2025-04-11 14:00:00	Cover letter from Rohit Sankar
10	10	10	2025-04-11 14:30:00	Cover letter from Anitha Raj
NULL	NULL	NULL	NULL	NULL

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

-- 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

Jobs.JobTitle,

COUNT(Applications.ApplicationID) AS ApplicationCount

FROM

Jobs

LEFT JOIN

Applications ON Jobs.JobID = Applications.JobID

GROUP BY

Jobs.JobTitle;

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JobTitle	ApplicationCount
Full Stack Developer	2
Data Analyst	1
Technical Support	1
UI/UX Designer	0
Backend Developer	0
Android app Developer	3
Quality Designer	1
DevOps Engineer	1
machine learning engineer	0
project manager	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

Jobs.JobTitle,

Companies.CompanyName,

Companies.Location,

Jobs.Salary

FROM

Jobs

JOIN

Companies ON Jobs.CompanyID = Companies.CompanyID

WHERE

Jobs.Salary BETWEEN 50000 AND 100000;

Result Grid				
Filter Rows:		Export:		
Wrap Cell Content:				
JobTitle	CompanyName	Location	Salary	
Full Stack Developer	ChenTech	Chennai	75000.00	
Data Analyst	KoCoders	Coimbatore	70000.00	
UI/UX Designer	TriDigital	chennai	65000.00	
Backend Developer	SaInnovations	Salem	80000.00	
Android app Developer	Techies	chennai	72000.00	
Quality Designer	VeSystems	Vellore	60000.00	
DevOps Engineer	TiruWorks	Tirunelveli	85000.00	
machine learning engineer	ThanData	Thanjavur	90000.00	
project manager	TutiSolutions	Thoothukudi	95000.00	

-- 7. Write an SQL query that retrieves the job application history for a specific applicant.

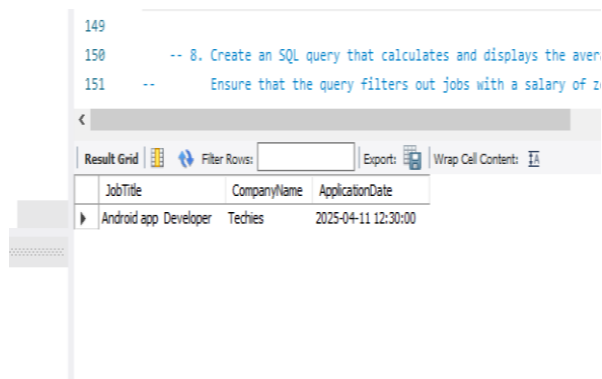
-- Allow a parameter for the ApplicantID, and return a result set with the job titles, company names, and application dates for all the jobs the applicant has applied to.

```

SELECT
Jobs.JobTitle,
Companies.CompanyName,
Applications.ApplicationDate
FROM
Applications
JOIN
Jobs ON Applications.JobID = Jobs.JobID
JOIN
Companies ON Jobs.CompanyID = Companies.CompanyID
WHERE

```

Applications.ApplicantID = 6;



-- 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

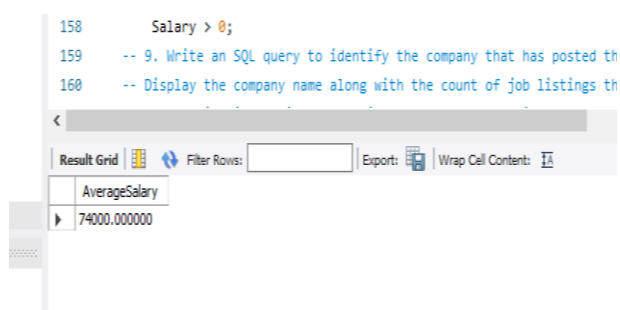
AVG(Salary) AS AverageSalary

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.

-- 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 Experience INT;

UPDATE Applicants SET Experience = 1 WHERE ApplicantID = 1;
UPDATE Applicants SET Experience = 2 WHERE ApplicantID = 2;
UPDATE Applicants SET Experience = 3 WHERE ApplicantID = 3;
UPDATE Applicants SET Experience = 4 WHERE ApplicantID = 4;
UPDATE Applicants SET Experience = 2 WHERE ApplicantID = 5;
UPDATE Applicants SET Experience = 5 WHERE ApplicantID = 6;
UPDATE Applicants SET Experience = 3 WHERE ApplicantID = 7;
UPDATE Applicants SET Experience = 1 WHERE ApplicantID = 8;
UPDATE Applicants SET Experience = 6 WHERE ApplicantID = 9;
UPDATE Applicants SET Experience = 4 WHERE ApplicantID = 10;
```

```
SELECT DISTINCT
    Applicants.ApplicantID,
    Applicants.FirstName,
    Applicants.LastName
FROM
    Applications
JOIN
```

Jobs ON Applications.JobID = Jobs.JobID

JOIN

Companies ON Jobs.CompanyID = Companies.CompanyID

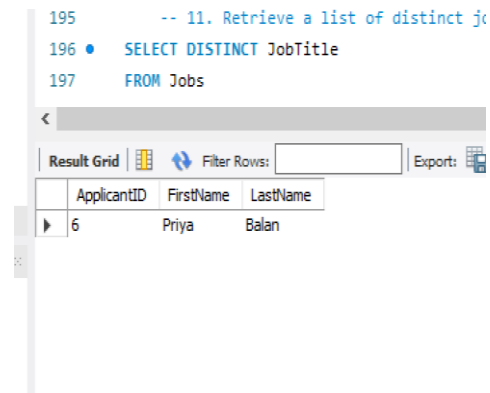
JOIN

Applicants ON Applications.ApplicantID = Applicants.ApplicantID

WHERE

Companies.Location = 'Chennai'

AND Applicants.Experience >= 3;



-- 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 80000;

203 WHERE JobID NOT IN (SEI

JobTitle
Full Stack Developer
Data Analyst
UI/UX Designer
Backend Developer
Android app Developer
Quality Designer

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

SELECT JobTitle

FROM Jobs

WHERE JobID NOT IN (SELECT DISTINCT JobID FROM Applications);

206 • SELECT

JobTitle
UI/UX Designer
Backend Developer
machine learning engineer

-- 13. Retrieve a list of job applicants along with the companies they have applied to and the positions they have applied for.

SELECT

Applicants.FirstName,

Applicants.LastName,

Companies.CompanyName,

Jobs.JobTitle

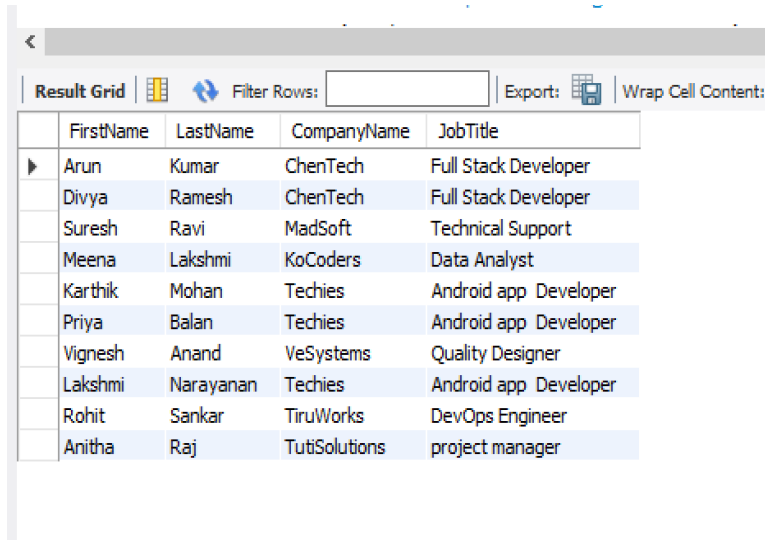
FROM

Applications

JOIN Jobs ON Applications.JobID = Jobs.JobID

JOIN Companies ON Jobs.CompanyID = Companies.CompanyID

JOIN Applicants ON Applications.ApplicantID = Applicants.ApplicantID;



The screenshot shows a web-based database interface. At the top, there is a toolbar with a 'Result Grid' button, a 'Filter Rows' input field, an 'Export' button, and a 'Wrap Cell Content' button. Below the toolbar is a table with 5 columns: 'FirstName', 'LastName', 'CompanyName', and 'JobTitle'. The table contains 11 rows of data, with the first row highlighted in blue.

FirstName	LastName	CompanyName	JobTitle
Arun	Kumar	ChenTech	Full Stack Developer
Divya	Ramesh	ChenTech	Full Stack Developer
Suresh	Ravi	MadSoft	Technical Support
Meena	Lakshmi	KoCoders	Data Analyst
Karthik	Mohan	Techies	Android app Developer
Priya	Balan	Techies	Android app Developer
Vignesh	Anand	VeSystems	Quality Designer
Lakshmi	Narayanan	Techies	Android app Developer
Rohit	Sankar	TiruWorks	DevOps Engineer
Anitha	Raj	TutiSolutions	project manager

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

INSERT INTO Companies (CompanyID, CompanyName, location)

VALUES (11, 'NoJobCorp', 'chennai');

SELECT

Companies.CompanyName,

COUNT(Jobs.JobID) AS JobPostCount

FROM

Companies

LEFT JOIN Jobs ON Companies.CompanyID = Jobs.CompanyID

GROUP BY Companies.CompanyName;

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230 -- 15. List all applicants along

<

Result Grid | Filter Rows:

	CompanyName	JobPostCount
▶	ChenTech	1
	KoCoders	1
	MadSoft	1
	TriDigital	1
	SaInnovations	1
	Techies	1
	VeSystems	1
	TiruWorks	1
	ThanData	1
	TutiSolutions	1
	NoJobCorp	0

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

SELECT

Applicants.FirstName,

Applicants.LastName,

Companies.CompanyName,

Jobs.JobTitle

FROM

Applicants

LEFT JOIN Applications ON Applicants.ApplicantID = Applications.ApplicantID

LEFT JOIN Jobs ON Applications.JobID = Jobs.JobID

LEFT JOIN Companies ON Jobs.CompanyID = Companies.CompanyID;

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

-- Assuming "city" and "state" fields exist (but not in current schema), skipping implementation as schema lacks city/state fields.

```
ALTER TABLE Applicants  
ADD City VARCHAR(100),  
ADD State VARCHAR(100);
```

```
UPDATE Applicants SET City = 'Chennai', State = 'Tamil Nadu' WHERE  
ApplicantID = 1;
```

```
UPDATE Applicants SET City = 'Madurai', State = 'Tamil Nadu' WHERE  
ApplicantID = 2;
```

```
UPDATE Applicants SET City = 'Salem', State = 'Tamil Nadu' WHERE  
ApplicantID = 3;
```

```
UPDATE Applicants SET City = 'Chennai', State = 'Tamil Nadu' WHERE  
ApplicantID = 4;
```

```
UPDATE Applicants SET City = 'Trichy', State = 'Tamil Nadu' WHERE  
ApplicantID = 5;
```

```
UPDATE Applicants SET City = 'Coimbatore', State = 'Tamil Nadu' WHERE  
ApplicantID = 6;
```

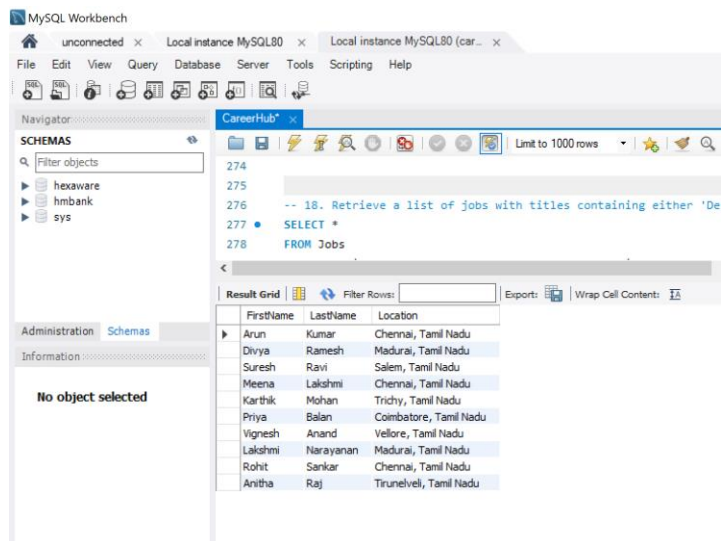
```
UPDATE Applicants SET City = 'Vellore', State = 'Tamil Nadu' WHERE  
ApplicantID = 7;
```

```
UPDATE Applicants SET City = 'Madurai', State = 'Tamil Nadu' WHERE  
ApplicantID = 8;
```

```
UPDATE Applicants SET City = 'Tirunelveli', State = 'Tamil Nadu' WHERE  
ApplicantID = 10;
```

UPDATE Applicants SET City = 'Chennai', State = 'Tamil Nadu' WHERE ApplicantID = 9;

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

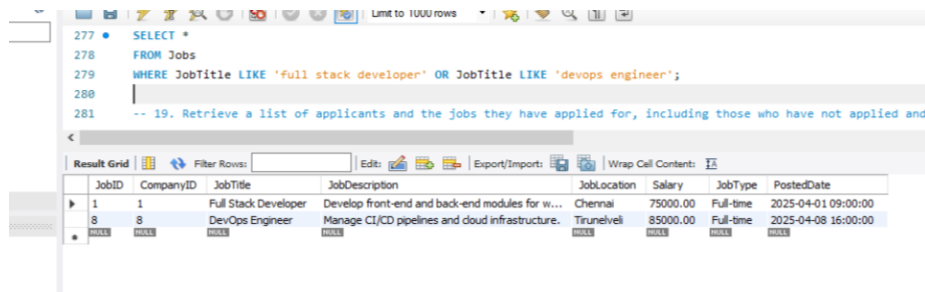


-- 18. Retrieve a list of jobs with titles containing either 'Developer' or 'Engineer'.

SELECT *

FROM Jobs

WHERE JobTitle LIKE 'full stack developer' OR JobTitle LIKE 'devops engineer';



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

SELECT

Applicants.FirstName,

Applicants.LastName,

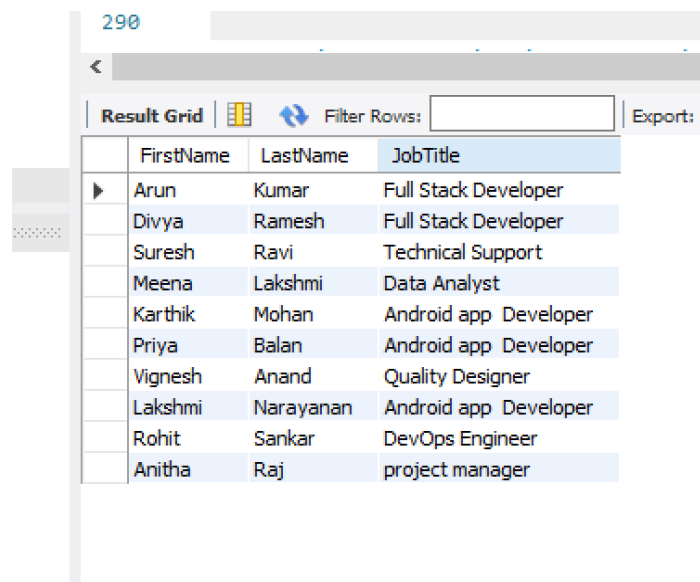
Jobs.JobTitle

FROM

Applicants

LEFT JOIN Applications ON Applicants.ApplicantID = Applications.ApplicantID

LEFT JOIN Jobs ON Applications.JobID = Jobs.JobID;



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Result Grid | Filter Rows: | Export:

	FirstName	LastName	JobTitle
▶	Arun	Kumar	Full Stack Developer
	Divya	Ramesh	Full Stack Developer
	Suresh	Ravi	Technical Support
	Meena	Lakshmi	Data Analyst
	Karthik	Mohan	Android app Developer
	Priya	Balan	Android app Developer
	Vignesh	Anand	Quality Designer
	Lakshmi	Narayanan	Android app Developer
	Rohit	Sankar	DevOps Engineer
	Anitha	Raj	project manager

-- 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.

-- Example: city = 'Chennai'

```
SELECT a.FirstName, a.LastName, a.Experience, c.CompanyName, c.Location
FROM Applicants a
JOIN Companies c ON LOWER(c.Location) = 'chennai'
WHERE a.Experience > 2;
```

297 WHERE a.Experience > 2;
298

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

	FirstName	LastName	Experience	CompanyName	Location
	Priya	Balan	5	TriDigital	chennai
	Meena	Lakshmi	4	TriDigital	chennai
	Suresh	Ravi	3	TriDigital	chennai
	Anitha	Raj	4	Techies	chennai
	Rohit	Sankar	6	Techies	chennai
	Vignesh	Anand	3	Techies	chennai
	Priya	Balan	5	Techies	chennai
	Meena	Lakshmi	4	Techies	chennai
	Suresh	Ravi	3	Techies	chennai
	Anitha	Raj	4	NoJobCorp	chennai
	Rohit	Sankar	6	NoJobCorp	chennai
	Vignesh	Anand	3	NoJobCorp	chennai
	Priya	Balan	5	NoJobCorp	chennai
	Meena	Lakshmi	4	NoJobCorp	chennai
	Suresh	Ravi	3	NoJobCorp	chennai

Result 124 ×