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College: Saveetha Engineering College

Centered Heading

Task 1-4: Database initialization with error handling

```sql
DROP DATABASE IF EXISTS CareerHub;
CREATE DATABASE CareerHub;
USE CareerHub;

-- Create Companies table
CREATE TABLE IF NOT EXISTS Companies (
    CompanyID INT AUTO_INCREMENT PRIMARY KEY,
    CompanyName VARCHAR(100) NOT NULL,
    Location VARCHAR(100) NOT NULL
);

-- Create Jobs table
CREATE TABLE IF NOT EXISTS Jobs (
    JobID INT AUTO_INCREMENT PRIMARY KEY,
    CompanyID INT NOT NULL,
    JobTitle VARCHAR(100) NOT NULL,
    JobDescription TEXT,
    JobLocation VARCHAR(100) NOT NULL,
    Salary DECIMAL(10, 2) CHECK (Salary >= 0),
    JobType ENUM('Full-time', 'Part-time', 'Contract', 'Internship') NOT NULL,
    PostedDate DATETIME DEFAULT CURRENT_TIMESTAMP,
    FOREIGN KEY (CompanyID) REFERENCES Companies(CompanyID) ON DELETE CASCADE
);

-- Create Applicants table
CREATE TABLE IF NOT EXISTS Applicants (
    ApplicantID INT AUTO_INCREMENT PRIMARY KEY,
    FirstName VARCHAR(50) NOT NULL,
    LastName VARCHAR(50) NOT NULL,
    Email VARCHAR(100) UNIQUE NOT NULL,
    Phone VARCHAR(20),
    Resume TEXT,
    ExperienceYears INT DEFAULT 0,
    City VARCHAR(50),
    State VARCHAR(50)
);

-- Create Applications table
CREATE TABLE IF NOT EXISTS Applications (
    ApplicationID INT AUTO_INCREMENT PRIMARY KEY,
    JobID INT NOT NULL,
    ApplicantID INT NOT NULL,
    ApplicationDate DATETIME DEFAULT CURRENT_TIMESTAMP,
    CoverLetter TEXT,
    FOREIGN KEY (JobID) REFERENCES Jobs(JobID) ON DELETE CASCADE,
    FOREIGN KEY (ApplicantID) REFERENCES Applicants(ApplicantID) ON DELETE CASCADE
);
```

```sql
-- Insert Indian companies
INSERT INTO Companies (CompanyName, Location) VALUES
('Hexaware Technologies', 'Mumbai'),
('Infosys', 'Bangalore'),
('TCS', 'Chennai'),
('Wipro', 'Pune'),
('Tech Mahindra', 'Hyderabad'),
('HCL Technologies', 'Noida'),
('LTI Mindtree', 'Mumbai'),
('Mphasis', 'Bangalore'),
('Capgemini', 'Gurgaon'),
('Accenture', 'Pune');

-- Insert job postings
INSERT INTO Jobs (CompanyID, JobTitle, JobDescription, JobLocation, Salary, JobType) VALUES
(1, 'Java Developer', 'Spring Boot development for banking solutions', 'Mumbai', 900000.00, '
(1, 'Automation Tester', 'Selenium with Java testing framework', 'Mumbai', 750000.00, 'Full-t
(2, 'Data Scientist', 'Build ML models for predictive analytics', 'Bangalore', 1200000.00, 'F
(3, '.NET Developer', 'ASP.NET Core development', 'Chennai', 850000.00, 'Full-time'),
(4, 'DevOps Engineer', 'AWS, Docker and Kubernetes implementation', 'Pune', 1100000.00, 'Full
(5, 'SAP Consultant', 'SAP FICO module implementation', 'Hyderabad', 1000000.00, 'Contract'),
(6, 'Python Developer', 'Django and Flask development', 'Noida', 800000.00, 'Full-time'),
(7, 'UI/UX Designer', 'Figma and Adobe XD prototyping', 'Mumbai', 700000.00, 'Full-time'),
(8, 'Business Analyst', 'Requirement gathering and analysis', 'Bangalore', 950000.00, 'Full-t
(9, 'Cloud Architect', 'Azure cloud solutions design', 'Gurgaon', 1300000.00, 'Full-time'),
(10, 'HR Recruiter', 'Tech recruitment for IT positions', 'Pune', 600000.00, 'Full-time');

-- Insert applicants
INSERT INTO Applicants (FirstName, LastName, Email, Phone, Resume, ExperienceYears, City, Sta
('Rahul', 'Sharma', 'rahul.sharma@email.com', '9876543210', 'Java developer with 5 years expe
('Priya', 'Patel', 'priya.patel@email.com', '8765432109', 'Automation tester with 3 years exp
('Amit', 'Singh', 'amit.singh@email.com', '7654321098', 'Data scientist with ML specializatio
('Neha', 'Gupta', 'neha.gupta@email.com', '6543210987', '.NET developer with 4 years experien
('Raj', 'Verma', 'raj.verma@email.com', '9432109876', 'DevOps engineer certified in AWS', 2,
('Ananya', 'Joshi', 'ananya.joshi@email.com', '8321098765', 'SAP consultant with FICO experie
('Vikram', 'Reddy', 'vikram.reddy@email.com', '7210987654', 'Python developer with Django ski
('Divya', 'Malhotra', 'divya.malhotra@email.com', '6109876543', 'UI/UX designer with portfoli
('Arjun', 'Kapoor', 'arjun.kapoor@email.com', '5098765432', 'Business analyst with banking do
('Pooja', 'Mehta', 'pooja.mehta@email.com', '4987654321', 'Cloud architect with Azure certifi

-- Insert applications
INSERT INTO Applications (JobID, ApplicantID, CoverLetter) VALUES
(1, 1, 'Dear Hiring Manager, I am excited to apply for the Java Developer position...'),
(2, 2, 'I have extensive experience in test automation using Selenium...'),
(3, 3, 'My machine learning skills would be valuable for your data science team...'),
(4, 4, 'I have been working with .NET Core for several years...'),
(5, 5, 'My DevOps experience aligns perfectly with your requirements...'),
(6, 6, 'I have implemented SAP FICO for multiple clients...'),
(7, 7, 'I specialize in Python web development using Django...'),
(8, 8, 'Attached is my portfolio of UI/UX design work...'),
(9, 9, 'My business analysis experience includes banking projects...'),
(10, 10, 'I am certified in Azure cloud architecture...');
```

Tables:

Companies:

	CompanyID	CompanyName	Location
▶	1	Hexaware Technologies	Mumbai
	2	Infosys	Bangalore
	3	TCS	Chennai
	4	Wipro	Pune
	5	Tech Mahindra	Hyderabad
	6	HCL Technologies	Noida
	7	LTI Mindtree	Mumbai
	8	Mphasis	Bangalore
	9	Capgemini	Gurgaon
	10	Accenture	Pune
*	NULL	NULL	NULL

Jobs:

	JobID	CompanyID	JobTitle	JobDescription	JobLocation	Salary	JobType	PostedDate
▶	1	1	Java Developer	Spring Boot development for banking solutions	Mumbai	900000.00	Full-time	2025-03-25 14:49:00
	2	1	Automation Tester	Selenium with Java testing framework	Mumbai	750000.00	Full-time	2025-03-25 14:49:00
	3	2	Data Scientist	Build ML models for predictive analytics	Bangalore	1200000.00	Full-time	2025-03-25 14:49:00
	4	3	.NET Developer	ASP.NET Core development	Chennai	850000.00	Full-time	2025-03-25 14:49:00
	5	4	DevOps Engineer	AWS, Docker and Kubernetes implementation	Pune	1100000.00	Full-time	2025-03-25 14:49:00
	6	5	SAP Consultant	SAP FICO module implementation	Hyderabad	1000000.00	Contract	2025-03-25 14:49:00
	7	6	Python Developer	Django and Flask development	Noida	800000.00	Full-time	2025-03-25 14:49:00
	8	7	UI/UX Designer	Figma and Adobe XD prototyping	Mumbai	700000.00	Full-time	2025-03-25 14:49:00
	9	8	Business Analyst	Requirement gathering and analysis	Bangalore	950000.00	Full-time	2025-03-25 14:49:00
	10	9	Cloud Architect	Azure cloud solutions design	Gurgaon	1300000.00	Full-time	2025-03-25 14:49:00
	11	10	HR Recruiter	Tech recruitment for IT positions	Pune	600000.00	Full-time	2025-03-25 14:49:00
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Applicants:

	ApplicantID	FirstName	LastName	Email	Phone	Resume	ExperienceYears	City	State
▶	1	Rahul	Sharma	rahul.sharma@email.com	9876543210	Java developer with 5 years experience	5	Mumbai	Maharashtra
	2	Priya	Patel	priya.patel@email.com	8765432109	Automation tester with 3 years experience	3	Bangalore	Karnataka
	3	Amit	Singh	amit.singh@email.com	7654321098	Data scientist with ML specialization	4	Chennai	Tamil Nadu
	4	Neha	Gupta	neha.gupta@email.com	6543210987	.NET developer with 4 years experience	4	Pune	Maharashtra
	5	Raj	Verma	raj.verma@email.com	9432109876	DevOps engineer certified in AWS	2	Hyderabad	Telangana
	6	Ananya	Joshi	ananya.joshi@email.com	8321098765	SAP consultant with FICO experience	6	Noida	Uttar Pradesh
	7	Vikram	Reddy	vikram.reddy@email.com	7210987654	Python developer with Django skills	3	Mumbai	Maharashtra
	8	Divya	Malhotra	divya.malhotra@email.com	6109876543	UI/UX designer with portfolio	1	Bangalore	Karnataka
	9	Arjun	Kapoor	arjun.kapoor@email.com	5098765432	Business analyst with banking domain	5	Gurgaon	Haryana
	10	Pooja	Mehta	pooja.mehta@email.com	4987654321	Cloud architect with Azure certification	7	Pune	Maharashtra
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Applications:

	ApplicationID	JobID	ApplicantID	ApplicationDate	CoverLetter
▶	1	1	1	2025-03-25 14:49:00	Dear Hiring Manager, I am excited to apply for t...
	2	2	2	2025-03-25 14:49:00	I have extensive experience in test automation ...
	3	3	3	2025-03-25 14:49:00	My machine learning skills would be valuable for ...
	4	4	4	2025-03-25 14:49:00	I have been working with .NET Core for several...
	5	5	5	2025-03-25 14:49:00	My DevOps experience aligns perfectly with yo...
	6	6	6	2025-03-25 14:49:00	I have implemented SAP FICO for multiple client...
	7	7	7	2025-03-25 14:49:00	I specialize in Python web development using Dj...
	8	8	8	2025-03-25 14:49:00	Attached is my portfolio of UI/UX design work...
	9	9	9	2025-03-25 14:49:00	My business analysis experience includes bankin...
	10	10	10	2025-03-25 14:49:00	I am certified in Azure cloud architecture...
*	NULL	NULL	NULL	NULL	NULL

Task 5-20:

5. Count applications per job (including jobs with 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
ORDER BY ApplicationCount DESC;
```

JobTitle	ApplicationCount
Java Developer	1
Automation Tester	1
Data Scientist	1
.NET Developer	1
DevOps Engineer	1
SAP Consultant	1
Python Developer	1
UI/UX Designer	1
Business Analyst	1
Cloud Architect	1
HR Recruiter	0

6. Jobs within a specified salary range (parameterized)

```
SET @min_salary = 800000;
SET @max_salary = 1100000;


SELECT j.JobTitle, c.CompanyName, j.JobLocation, j.Salary
FROM Jobs j
JOIN Companies c
ON j.CompanyID = c.CompanyID
WHERE j.Salary BETWEEN @min_salary AND @max_salary
ORDER BY j.Salary DESC;
```

JobTitle	CompanyName	JobLocation	Salary
DevOps Engineer	Wipro	Pune	1100000.00
SAP Consultant	Tech Mahindra	Hyderabad	1000000.00
Business Analyst	Mphasis	Bangalore	950000.00
Java Developer	Hexaware Technologies	Mumbai	900000.00
.NET Developer	TCS	Chennai	850000.00
Python Developer	HCL Technologies	Noida	800000.00

7. Job application history for a specific applicant

```
SET @applicant_id = 1;


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 = @applicant_id
ORDER BY a.ApplicationDate DESC;
```

JobTitle	CompanyName	ApplicationDate
Java Developer	Hexaware Technologies	2025-03-25 14:49:00

8. Average salary (excluding zero)

```
SELECT ROUND(AVG(Salary), 2) AS AverageSalary
FROM Jobs
WHERE Salary > 0;
```

AverageSalary
922727.27

9. Company with most job postings (handles ties)

```
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 COUNT(JobID)
    FROM Jobs
    GROUP BY CompanyID
    ORDER BY COUNT(JobID) DESC
    LIMIT 1
);
```

	CompanyName	JobCount
▶	Hexaware Technologies	2

10. Applicants in 'Mumbai' with 3+ years experience

```
SET @city = 'Mumbai';


SELECT a.FirstName, a.LastName, a.Email, a.ExperienceYears
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
WHERE c.Location = @city AND a.ExperienceYears >= 3;
```
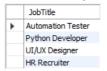
	FirstName	LastName	Email	ExperienceYears
▶	Rahul	Sharma	rahul.sharma@email.com	5
	Priya	Patel	priya.patel@email.com	3

11. Find job titles in salary range

```
SELECT DISTINCT JobTitle
FROM Jobs
WHERE Salary BETWEEN 600000 AND 800000;
```

	JobTitle
▶	Automation Tester
	Python Developer
	UI/UX Designer
	HR Recruiter

12. Find jobs with no applications

```
SELECT j.JobTitle, c.CompanyName
FROM Jobs j
JOIN Companies c ON j.CompanyID = c.CompanyID
LEFT JOIN Applications a ON j.JobID = a.JobID
WHERE a.ApplicationID IS NULL;
```

	JobTitle	CompanyName
▶	HR Recruiter	Accenture

13. Show all applicants and their applications

```
SELECT CONCAT(a.FirstName, ' ', a.LastName) AS ApplicantName, c.CompanyName, j.JobTitle
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
ORDER BY ApplicantName;
```

	ApplicantName	CompanyName	JobTitle
▶	Amit Singh	Infosys	Data Scientist
	Ananya Joshi	Tech Mahindra	SAP Consultant
	Arjun Kapoor	Mphasis	Business Analyst
	Divya Malhotra	LTI Mindtree	UI/UX Designer
	Neha Gupta	TCS	.NET Developer
	Pooja Mehta	Capgemini	Cloud Architect
	Priya Patel	Hexaware Technologies	Automation Tester
	Rahul Sharma	Hexaware Technologies	Java Developer
	Raj Verma	Wipro	DevOps Engineer
	Vikram Reddy	HCL Technologies	Python Developer

14. Count jobs per company

```
SELECT c.CompanyName, COUNT(j.JobID) AS NumberOfJobs
FROM Companies c
LEFT JOIN Jobs j ON c.CompanyID = j.CompanyID
GROUP BY c.CompanyName
ORDER BY NumberOfJobs DESC;
```

CompanyName	NumberOfJobs
Hexaware Technologies	2
Infosys	1
TCS	1
Wipro	1
Tech Mahindra	1
HCL Technologies	1
LTI Mindtree	1
Mphasis	1
Capgemini	1
Accenture	1

15. Show all applicants (even without applications)

```
SELECT CONCAT(a.FirstName, ' ', a.LastName) AS ApplicantName, c.CompanyName, j.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
ORDER BY ApplicantName;
```

ApplicantName	CompanyName	JobTitle
Amit Singh	Infosys	Data Scientist
Ananya Joshi	Tech Mahindra	SAP Consultant
Arjun Kapoor	Mphasis	Business Analyst
Divya Malhotra	LTI Mindtree	UI/UX Designer
Neha Gupta	TCS	.NET Developer
Pooja Mehta	Capgemini	Cloud Architect
Priya Patel	Hexaware Technologies	Automation Tester
Rahul Sharma	Hexaware Technologies	Java Developer
Raj Verma	Wipro	DevOps Engineer
Vikram Reddy	HCL Technologies	Python Developer

16. Companies paying above average

```
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
Infosys
Wipro
Tech Mahindra
Mphasis
Capgemini

17. Applicant locations

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

ApplicantName	Location
Rahul Sharma	Mumbai, Maharashtra
Priya Patel	Bangalore, Karnataka
Amit Singh	Chennai, Tamil Nadu
Neha Gupta	Pune, Maharashtra
Raj Verma	Hyderabad, Telangana
Ananya Joshi	Noida, Uttar Pradesh
Vikram Reddy	Mumbai, Maharashtra
Divya Malhotra	Bangalore, Karnataka
Arjun Kapoor	Gurgaon, Haryana
Pooja Mehta	Pune, Maharashtra

18. Find Developer/Engineer jobs

```
SELECT JobTitle, CompanyID
FROM Jobs
WHERE JobTitle LIKE '%Developer%' OR JobTitle LIKE '%Engineer%';
```

JobTitle	CompanyID
Java Developer	1
.NET Developer	3
DevOps Engineer	4
Python Developer	6

19. Complete application overview

```sql
(SELECT
    CONCAT(a.FirstName, ' ', a.LastName) AS ApplicantName,
    j.JobTitle,
    c.CompanyName
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)
UNION
(SELECT
    NULL AS ApplicantName,
    j.JobTitle,
    c.CompanyName
FROM Jobs j
JOIN Companies c ON j.CompanyID = c.CompanyID
LEFT JOIN Applications app ON j.JobID = app.JobID
WHERE app.ApplicationID IS NULL)
ORDER BY ApplicantName;
```

ApplicantName	JobTitle	CompanyName
NULL	HR Recruiter	Accenture
Amit Singh	Data Scientist	Infosys
Ananya Joshi	SAP Consultant	Tech Mahindra
Arjun Kapoor	Business Analyst	Mphasis
Divya Malhotra	UI/UX Designer	LTI Mindtree
Neha Gupta	.NET Developer	TCS
Pooja Mehta	Cloud Architect	Capgemini
Priya Patel	Automation Tester	Hexaware Technologies
Rahul Sharma	Java Developer	Hexaware Technologies
Raj Verma	DevOps Engineer	Wipro
Vikram Reddy	Python Developer	HCL Technologies

20. Match applicants to companies by city

```sql
SET @city = 'Chennai';


SELECT
    CONCAT(a.FirstName, ' ', a.LastName) AS ApplicantName,
    c.CompanyName,
    a.ExperienceYears
FROM Applicants a
CROSS JOIN Companies c
WHERE c.Location = @city AND a.ExperienceYears > 2;
```

ApplicantName	CompanyName	ExperienceYears
Rahul Sharma	TCS	5
Priya Patel	TCS	3
Amit Singh	TCS	4
Neha Gupta	TCS	4
Ananya Joshi	TCS	6
Vikram Reddy	TCS	3
Arjun Kapoor	TCS	5
Pooja Mehta	TCS	7