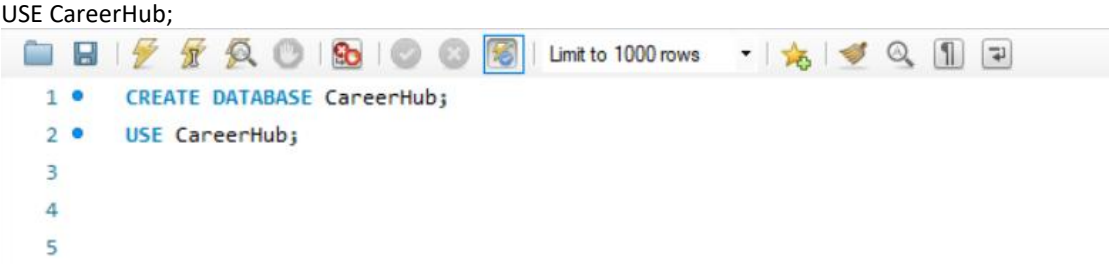
Coding Challenges: CareerHub, The Job Board

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(255),
 Location VARCHAR(255)
);
CREATE TABLE Jobs (
 JobID INT PRIMARY KEY,
 CompanyID INT,
 FOREIGN KEY (CompanyID) REFERENCES Companies(CompanyID),
 JobTitle VARCHAR(255),
 JobDescription TEXT,
 JobLocation VARCHAR(255),
 Salary DECIMAL,
 JobType VARCHAR(255),
 PostedDate DATETIME,
 CONSTRAINT FK_JobCompany FOREIGN KEY (CompanyID) REFERENCES
Companies(CompanyID)
);
CREATE TABLE Applicants (
 ApplicantID INT PRIMARY KEY,
 FirstName VARCHAR(255),
 LastName VARCHAR(255),
 Email VARCHAR(255),
 Phone VARCHAR(20),
 Resume TEXT
);
CREATE TABLE Applications (
 ApplicationID INT PRIMARY KEY,
 JobID INT,
 ApplicantID INT,
 ApplicationDate DATETIME,
 CoverLetter TEXT,
 CONSTRAINT FK_ApplicationJob FOREIGN KEY (JobID) REFERENCES Jobs(JobID),
 CONSTRAINT FK_ApplicationApplicant FOREIGN KEY (ApplicantID) REFERENCES
Applicants(ApplicantID)
);
```

```sql
CREATE TABLE Companies (
 CompanyID INT PRIMARY KEY,
 CompanyName VARCHAR(255),
 Location VARCHAR(255)
);
CREATE TABLE Jobs (
 JobID INT PRIMARY KEY,
 CompanyID INT,
 FOREIGN KEY (CompanyID) REFERENCES Companies(CompanyID),
 JobTitle VARCHAR(255),
 JobDescription TEXT,
 JobLocation VARCHAR(255),
 Salary DECIMAL,
 JobType VARCHAR(255),
 PostedDate DATETIME,
 CONSTRAINT FK_JobCompany FOREIGN KEY (CompanyID) REFERENCES
Companies(CompanyID)
);
```

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

Tables_in_careerhub
applicants
applications
companies
jobs

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.

```sql
SELECT
 J.JobID,
 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;
```

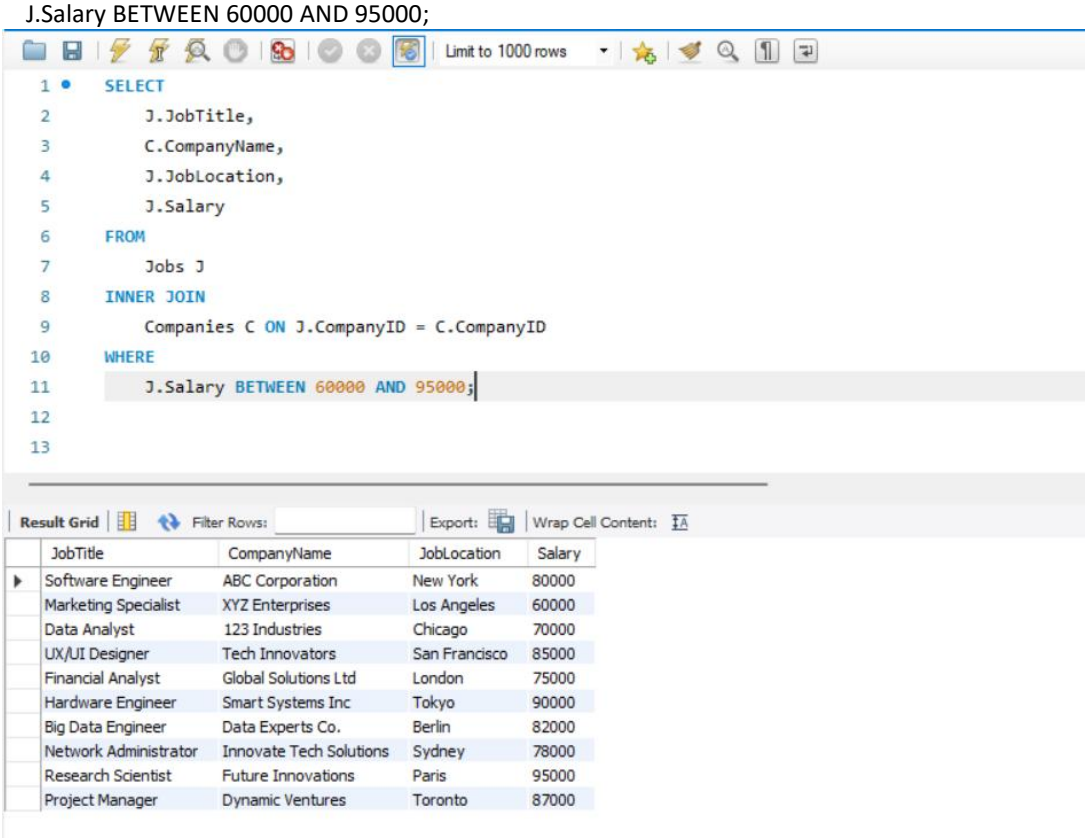
```sql
SELECT
 J.JobID,
 J.JobTitle,
 COUNT(A.ApplicationID) AS ApplicationCount
FROM
 Jobs J
LEFT JOIN
 Applications A ON J.JobID = A.JobID
GROUP BY
 J.JobID, J.JobTitle;
```

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

JobID	JobTitle	ApplicationCount
1	Software Engineer	1
2	Marketing Specialist	1
3	Data Analyst	1
4	UX/UI Designer	1
5	Financial Analyst	1
6	Hardware Engineer	1
7	Big Data Engineer	1
8	Network Administrator	1
9	Research Scientist	1
10	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
   J.JobTitle,
   C.CompanyName,
   J.JobLocation,
   J.Salary
FROM
   Jobs J
INNER JOIN
   Companies C ON J.CompanyID = C.CompanyID
WHERE
   J.Salary BETWEEN 60000 AND 95000;
```



JobTitle	CompanyName	JobLocation	Salary
Software Engineer	ABC Corporation	New York	80000
Marketing Specialist	XYZ Enterprises	Los Angeles	60000
Data Analyst	123 Industries	Chicago	70000
UX/UI Designer	Tech Innovators	San Francisco	85000
Financial Analyst	Global Solutions Ltd	London	75000
Hardware Engineer	Smart Systems Inc	Tokyo	90000
Big Data Engineer	Data Experts Co.	Berlin	82000
Network Administrator	Innovate Tech Solutions	Sydney	78000
Research Scientist	Future Innovations	Paris	95000
Project Manager	Dynamic Ventures	Toronto	87000

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
INNER JOIN
   Jobs J ON A.JobID = J.JobID
INNER JOIN
   Companies C ON J.CompanyID = C.CompanyID
WHERE
   A.ApplicantID = 1;
```

```sql
SELECT
    J.JobTitle,
    C.CompanyName,
    A.ApplicationDate
FROM
    Applications A
INNER JOIN
    Jobs J ON A.JobID = J.JobID
INNER JOIN
    Companies C ON J.CompanyID = C.CompanyID
WHERE
    A.ApplicantID = 1;
```

Result Grid

JobTitle	CompanyName	ApplicationDate
Software Engineer	ABC Corporation	2024-01-24 09:30:00

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.

```sql
SELECT
   AVG(Salary) AS AverageSalary
FROM
   Jobs
WHERE
   Salary > 0;
```

```sql
SELECT
    AVG(Salary) AS AverageSalary
FROM
    Jobs
WHERE
    Salary > 0;
```

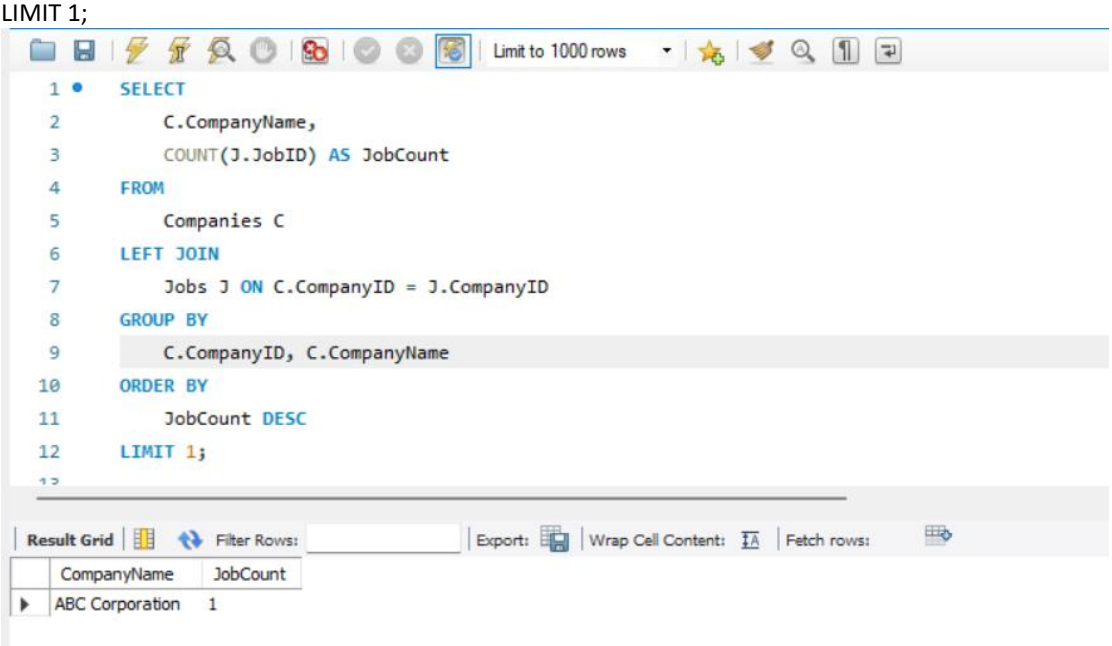
Result Grid

AverageSalary
80200.0000

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.

```sql
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
ORDER BY
   JobCount DESC
LIMIT 1;
```



10. 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,
   A.Email,
   A.Phone
FROM
   Applicants A
WHERE
         A.ApplicantID IN (
                  Select
                           Ap.ApplicantID
                  FROM
                           Applications Ap
                  INNER JOIN
                           Jobs J ON Ap.JobID = J.JobID
                  INNER JOIN
                           Companies C ON J.CompanyID = C.CompanyID
      WHERE
                           J.JobLocation = 'Tokyo'
                           AND DATEDIFF(CURDATE(), J.PostedDate) >= 1095
   );
```

```
        A.LastName,
        A.Email,
        A.Phone
    FROM
        Applicants A
    WHERE
        A.ApplicantID IN (
            Select
                Ap.ApplicantID
            FROM
                Applications Ap
            INNER JOIN
                Jobs J ON Ap.JobID = J.JobID
            INNER JOIN
                Companies C ON J.CompanyID = C.CompanyID
            WHERE
                J.JobLocation = 'Tokyo'
                AND DATEDIFF(CURDATE(), J.PostedDate) >= 1095
        );
```

Result Grid

ApplicantID	FirstName	LastName	Email	Phone
NULL	NULL	NULL	NULL	NULL

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;
```

```
SELECT DISTINCT
    JobTitle
FROM
    Jobs
WHERE
    Salary BETWEEN 60000 AND 80000;
```

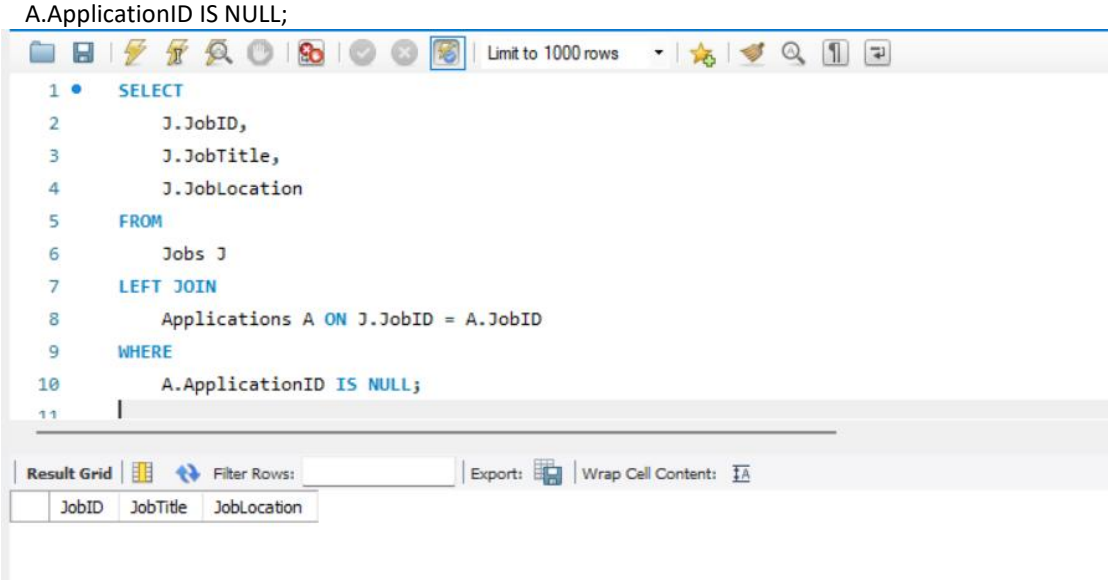
Result Grid

JobTitle
Software Engineer
Marketing Specialist
Data Analyst
Financial Analyst
Network Administrator

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

```
SELECT
   J.JobID,
   J.JobTitle,
   J.JobLocation
FROM
   Jobs J
```

```
LEFT JOIN
   Applications A ON J.JobID = A.JobID
WHERE
   A.ApplicationID IS NULL;
```



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

```
SELECT
   A.ApplicantID,
   A.FirstName,
   A.LastName,
   A.Email,
   A.Phone,
   C.CompanyName,
   J.JobTitle
FROM
   Applicants A
JOIN
   Applications Ap ON A.ApplicantID = Ap.ApplicantID
JOIN
   Jobs J ON Ap.JobID = J.JobID
JOIN
   Companies C ON J.CompanyID = C.CompanyID;
```

```
SELECT
    A.ApplicantID,
    A.FirstName,
    A.LastName,
    A.Email,
    A.Phone,
    C.CompanyName,
    J.JobTitle
FROM
    Applicants A
JOIN
    Applications Ap ON A.ApplicantID = Ap.ApplicantID
JOIN
    Jobs J ON Ap.JobID = J.JobID
JOIN
    Companies C ON J.CompanyID = C.CompanyID;
```

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

ApplicantID	FirstName	LastName	Email	Phone	CompanyName	JobTitle
1	John	Doe	john.doe@email.com	555-1234	ABC Corporation	Software Engineer
2	Jane	Smith	jane.smith@email.com	555-5678	XYZ Enterprises	Marketing Specialist
3	Mike	Johnson	mike.johnson@email.com	555-9876	123 Industries	Data Analyst
4	Emily	Williams	emily.williams@email.com	555-4321	Tech Innovators	UX/UI Designer
5	Chris	Taylor	chris.taylor@email.com	555-8765	Global Solutions Ltd	Financial Analyst
6	Amanda	Clark	amanda.clark@email.com	555-2345	Smart Systems Inc	Hardware Engineer
7	Daniel	Brown	daniel.brown@email.com	555-8765	Data Experts Co.	Big Data Engineer
8	Olivia	White	olivia.white@email.com	555-3456	Innovate Tech Solutions	Network Administrator
9	Ethan	Miller	ethan.miller@email.com	555-6543	Future Innovations	Research Scientist
10	Sophia	Davis	sophia.davis@email.com	555-7890	Dynamic Ventures	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.**

```
SELECT
   C.CompanyID,
   C.CompanyName,
   COUNT(J.JobID) AS JobCount
FROM
   Companies C
LEFT JOIN
   Jobs J ON C.CompanyID = J.CompanyID
LEFT JOIN
   Applications A ON J.JobID = A.JobID
GROUP BY
   C.CompanyID, C.CompanyName;
```

```
SELECT
    C.CompanyID,
    C.CompanyName,
    COUNT(J.JobID) AS JobCount
FROM
    Companies C
LEFT JOIN
    Jobs J ON C.CompanyID = J.CompanyID
LEFT JOIN
    Applications A ON J.JobID = A.JobID
GROUP BY
    C.CompanyID, C.CompanyName;
```

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

CompanyID	CompanyName	JobCount
1	ABC Corporation	1
2	XYZ Enterprises	1
3	123 Industries	1
4	Tech Innovators	1
5	Global Solutions Ltd	1
6	Smart Systems Inc	1
7	Data Experts Co.	1
8	Innovate Tech Solutions	1
9	Future Innovations	1
10	Dynamic Ventures	1

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

```
SELECT
   A.ApplicantID,
   A.FirstName,
   A.LastName,
   A.Email,
   A.Phone,
   COALESCE(C.CompanyName, 'Not Applied') As CompanyName,
   COALESCE(J.JobTitle, 'Not Applied') As JobTitle
FROM
   Applicants A
LEFT JOIN
   Applications Ap ON A.ApplicantID = Ap.ApplicantID
LEFT JOIN
            Jobs J ON Ap.JobID = J.JobID
LEFT JOIN
   Companies C ON J.CompanyID = C.CompanyID;
```

```sql
SELECT
    A.ApplicantID,
    A.FirstName,
    A.LastName,
    A.Email,
    A.Phone,
    COALESCE(C.CompanyName, 'Not Applied') As CompanyName,
    COALESCE(J.JobTitle, 'Not Applied') As JobTitle
FROM
    Applicants A
LEFT JOIN
    Applications Ap ON A.ApplicantID = Ap.ApplicantID
LEFT JOIN
    Jobs J ON Ap.JobID = J.JobID
LEFT JOIN
    Companies C ON J.CompanyID = C.CompanyID;
```

ApplicantID	FirstName	LastName	Email	Phone	CompanyName	JobTitle
1	John	Doe	john.doe@email.com	555-1234	ABC Corporation	Software Engineer
2	Jane	Smith	jane.smith@email.com	555-5678	XYZ Enterprises	Marketing Specialist
3	Mike	Johnson	mike.johnson@email.com	555-9876	123 Industries	Data Analyst
4	Emily	Williams	emily.williams@email.com	555-4321	Tech Innovators	UX/UI Designer
5	Chris	Taylor	chris.taylor@email.com	555-8765	Global Solutions Ltd	Financial Analyst
6	Amanda	Clark	amanda.clark@email.com	555-2345	Smart Systems Inc	Hardware Engineer
7	Daniel	Brown	daniel.brown@email.com	555-8765	Data Experts Co.	Big Data Engineer
8	Olivia	White	olivia.white@email.com	555-3456	Innovate Tech Solutions	Network Administrator
9	Ethan	Miller	ethan.miller@email.com	555-6543	Future Innovations	Research Scientist
10	Sophia	Davis	sophia.davis@email.com	555-7890	Dynamic Ventures	Project Manager

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

```sql
SELECT
   C.CompanyID,
   C.CompanyName
FROM
   Companies C
JOIN
   Jobs J ON C.CompanyID = J.CompanyID
GROUP BY
   C.CompanyID, C.CompanyName
HAVING
   MAX(J.Salary) > (SELECT AVG(Salary) FROM Jobs);
```

```sql
SELECT
    C.CompanyID,
    C.CompanyName
FROM
    Companies C
JOIN
    Jobs J ON C.CompanyID = J.CompanyID
GROUP BY
    C.CompanyID, C.CompanyName
HAVING
    MAX(J.Salary) > (SELECT AVG(Salary) FROM Jobs);
```

CompanyID	CompanyName
4	Tech Innovators
6	Smart Systems Inc
7	Data Experts Co.
9	Future Innovations
10	Dynamic Ventures

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

```
SELECT
   ApplicantID,
   FirstName,
   LastName,
   CONCAT(City, ', ', State) AS CityState
FROM
   Applicants;
```

Limit to 1000 rows

```
1 • SELECT
2       ApplicantID,
3       FirstName,
4       LastName,
5       CONCAT(City, ', ', State) AS CityState
6   FROM
7       Applicants;
```

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

ApplicantID	FirstName	LastName	CityState
1	John	Doe	New York, NY
2	Jane	Smith	Los Angeles, CA
3	Mike	Johnson	Chicago, IL
4	Emily	Williams	San Francisco, CA
5	Chris	Taylor	London, UK
6	Amanda	Clark	Toronto, ON
7	Daniel	Brown	Berlin, DE
8	Olivia	White	Sydney, NSW
9	Ethan	Miller	Tokyo, JP
10	Sophia	Davis	Mumbai, MH

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

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

Limit to 1000 rows

```
1 • SELECT
2       JobID,
3       JobTitle
4   FROM
5       Jobs
6   WHERE
7       JobTitle LIKE '%Developer%'
8       OR JobTitle LIKE '%Engineer%';
```

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

JobID	JobTitle
1	Software Engineer
6	Hardware Engineer
7	Big Data Engineer
NULL	NULL

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.ApplicantID,
   A.FirstName,
   A.LastName,
   A.Email,
   A.Phone,
   J.JobID,
   J.JobTitle
FROM
   Applicants A
CROSS JOIN
   Jobs J
LEFT JOIN
   Applications Ap ON A.ApplicantID = Ap.ApplicantID AND J.JobID = Ap.JobID;
```

Result Grid

ApplicantID	FirstName	LastName	Email	Phone	JobID	JobTitle
10	Sophia	Davis	sophia.davis@email.com	555-7890	1	Software Engineer
9	Ethan	Miller	ethan.miller@email.com	555-6543	1	Software Engineer
8	Olivia	White	olivia.white@email.com	555-3456	1	Software Engineer
7	Daniel	Brown	daniel.brown@email.com	555-8765	1	Software Engineer
6	Amanda	Clark	amanda.clark@email.com	555-2345	1	Software Engineer
5	Chris	Taylor	chris.taylor@email.com	555-8765	1	Software Engineer
4	Emily	Williams	emily.williams@email.com	555-4321	1	Software Engineer
3	Mike	Johnson	mike.johnson@email.com	555-9876	1	Software Engineer
2	Jane	Smith	jane.smith@email.com	555-5678	1	Software Engineer
1	John	Doe	john.doe@email.com	555-1234	1	Software Engineer
10	Sophia	Davis	sophia.davis@email.com	555-7890	2	Marketing Specialist
9	Ethan	Miller	ethan.miller@email.com	555-6543	2	Marketing Specialist
8	Olivia	White	olivia.white@email.com	555-3456	2	Marketing Specialist
7	Daniel	Brown	daniel.brown@email.com	555-8765	2	Marketing Specialist
6	Amanda	Clark	amanda.clark@email.com	555-2345	2	Marketing Specialist
5	Chris	Taylor	chris.taylor@email.com	555-8765	2	Marketing Specialist
4	Emily	Williams	emily.williams@email.com	555-4321	2	Marketing Specialist
3	Mike	Johnson	mike.johnson@email.com	555-9876	2	Marketing Specialist
2	Jane	Smith	jane.smith@email.com	555-5678	2	Marketing Specialist

Result 170

Result Grid

ApplicantID	FirstName	LastName	Email	Phone	JobID	JobTitle
3	Mike	Johnson	mike.johnson@email.com	555-9876	5	Financial Analyst
2	Jane	Smith	jane.smith@email.com	555-5678	5	Financial Analyst
1	John	Doe	john.doe@email.com	555-1234	5	Financial Analyst
10	Sophia	Davis	sophia.davis@email.com	555-7890	6	Hardware Engineer
9	Ethan	Miller	ethan.miller@email.com	555-6543	6	Hardware Engineer
8	Olivia	White	olivia.white@email.com	555-3456	6	Hardware Engineer
7	Daniel	Brown	daniel.brown@email.com	555-8765	6	Hardware Engineer
6	Amanda	Clark	amanda.clark@email.com	555-2345	6	Hardware Engineer
5	Chris	Taylor	chris.taylor@email.com	555-8765	6	Hardware Engineer
4	Emily	Williams	emily.williams@email.com	555-4321	6	Hardware Engineer
3	Mike	Johnson	mike.johnson@email.com	555-9876	6	Hardware Engineer
2	Jane	Smith	jane.smith@email.com	555-5678	6	Hardware Engineer
1	John	Doe	john.doe@email.com	555-1234	6	Hardware Engineer
10	Sophia	Davis	sophia.davis@email.com	555-7890	7	Big Data Engineer
9	Ethan	Miller	ethan.miller@email.com	555-6543	7	Big Data Engineer
8	Olivia	White	olivia.white@email.com	555-3456	7	Big Data Engineer
7	Daniel	Brown	daniel.brown@email.com	555-8765	7	Big Data Engineer
6	Amanda	Clark	amanda.clark@email.com	555-2345	7	Big Data Engineer
5	Chris	Taylor	chris.taylor@email.com	555-8765	7	Big Data Engineer
4	Emily	Williams	emily.williams@email.com	555-4321	7	Big Data Engineer
3	Mike	Johnson	mike.johnson@email.com	555-9876	7	Big Data Engineer
2	Jane	Smith	jane.smith@email.com	555-5678	7	Big Data Engineer
1	John	Doe	john.doe@email.com	555-1234	7	Big Data Engineer

Result 170

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.ApplicantID,
        A.FirstName, A.LastName,
        C.CompanyID,
        C.CompanyName,
        C.Location AS CompanyLocation
FROM
        Applicants A
CROSS JOIN
        Companies C
LEFT JOIN
        Applications Ap ON A.ApplicantID = Ap.ApplicantID
LEFT JOIN
        Jobs J ON Ap.JobID= J.JobID
WHERE
        C.Location = 'Tokyo'
        AND (YEAR(CURDATE()) - YEAR(J.PostedDate) > 2 OR J.PostedDate IS NULL);
```