Big data Management

Assignment 3

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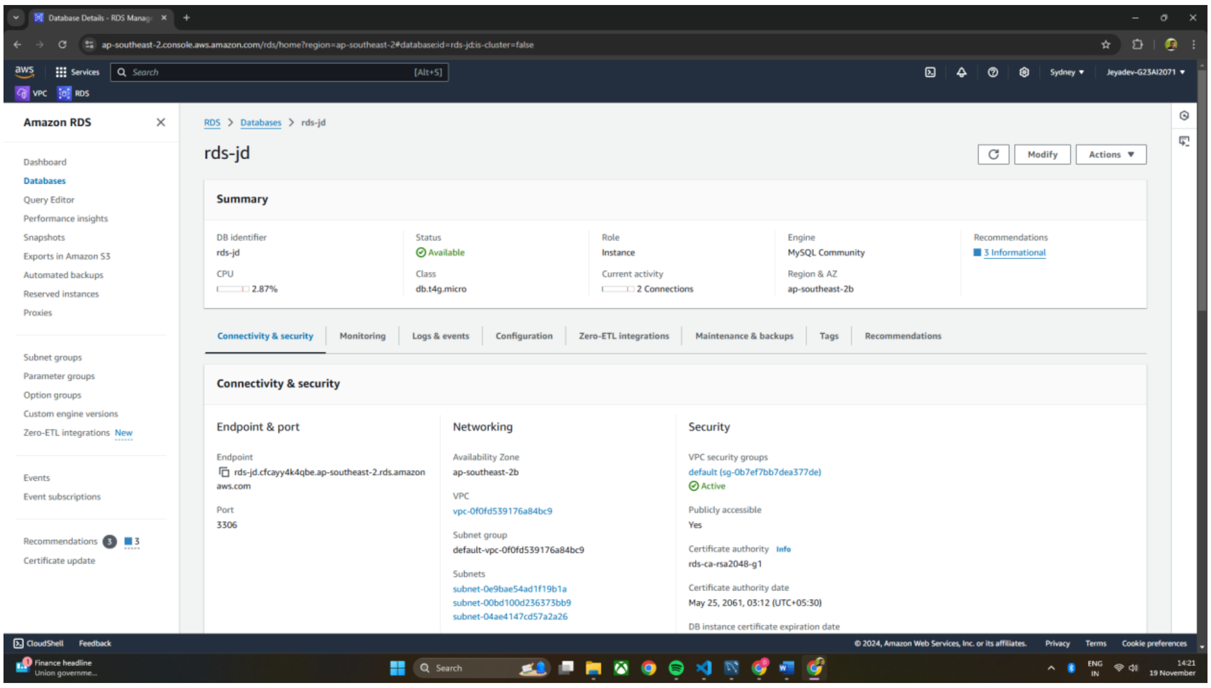
RDS Setup



rds-jd

Summary

DB identifier: rds-jd
CPU: 2.87%
Status: Available
Class: db.t4g.micro
Role: Instance
Current activity: 2 Connections
Engine: MySQL Community
Region & AZ: ap-southeast-2b
Recommendations: 3 Informational

Connectivity & security

Endpoint & port

Endpoint: rds-jd.cfcayy4k4qbe.ap-southeast-2.rds.amazonaws.com
Port: 3306

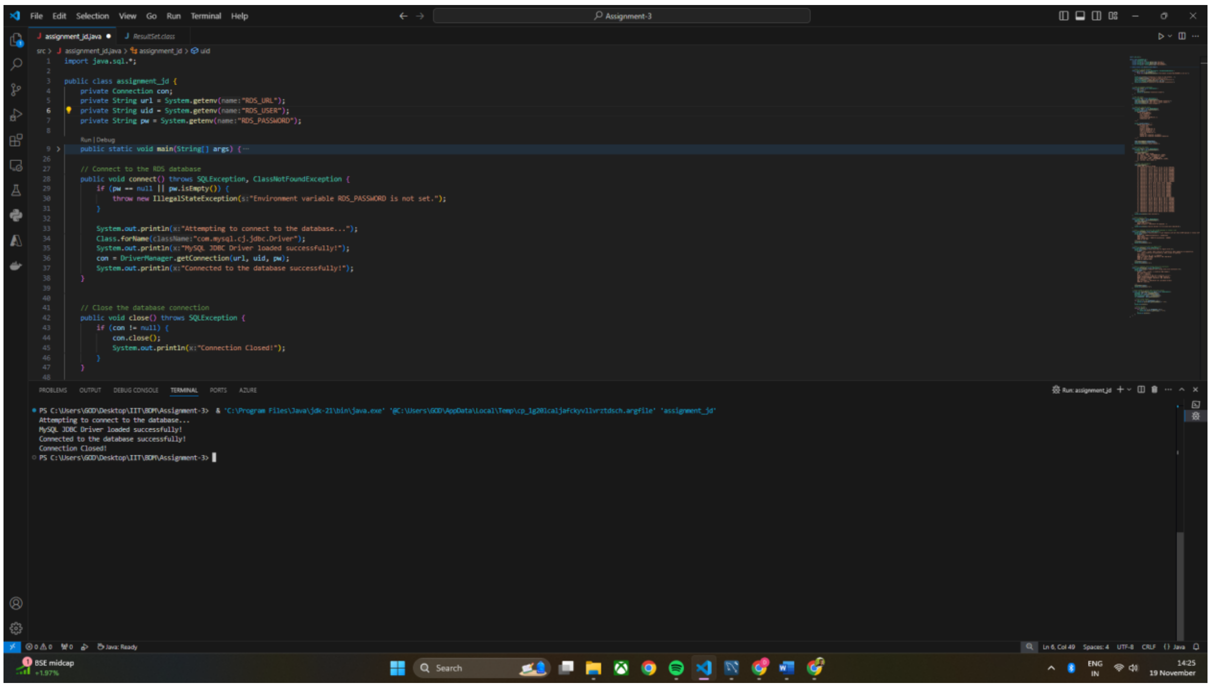
Networking

Availability Zone: ap-southeast-2b
VPC: vpc-0f0fd539176a84bc9
Subnet group: default-vpc-0f0fd539176a84bc9
Subnets:
subnet-0e9bae54ad1f19b1a
subnet-00bd100d236373bb9
subnet-04ae4147cd57a2a26

Security

VPC security groups: default (sg-0b7ef7bb7dea377de) Active
Publicly accessible: Yes
Certificate authority: rds-ca-rsa2048-g1
Certificate authority date: May 25, 2061, 03:12 (UTC+05:30)
DB instance certificate expiration date

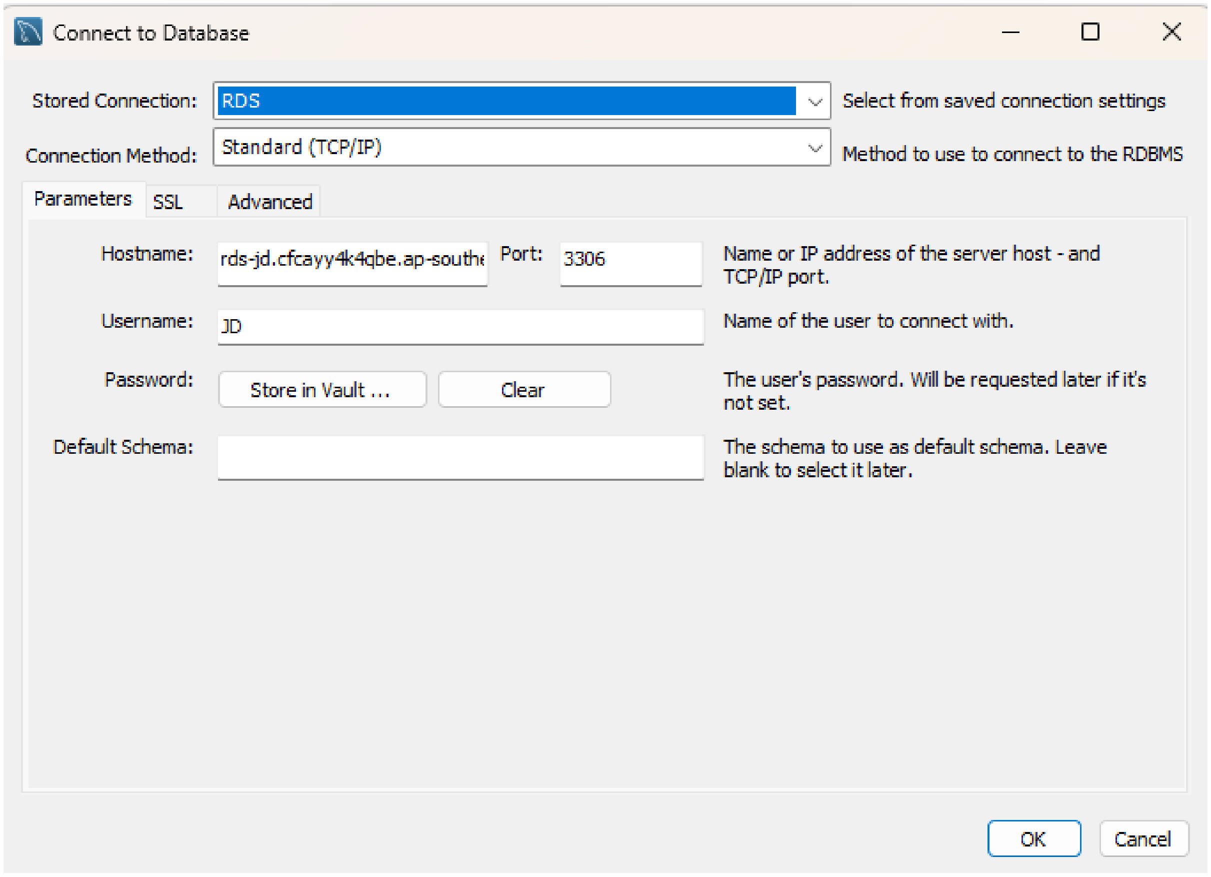
Connecting to RDS VIA JAVA



```java
import java.sql.*;

public class assignment_jd {
    private Connection con;
    private String url = System.getenv(name:"RDS_URL");
    private String uid = System.getenv(name:"RDS_USER");
    private String pw = System.getenv(name:"RDS_PASSWORD");

    public static void main(String[] args) {···

    // Connect to the RDS database
    public void connect() throws SQLException, ClassNotFoundException {
        if (pw == null || pw.isEmpty()) {
            throw new IllegalStateException(s:"Environment variable RDS_PASSWORD is not set.");
        }

        System.out.println(x:"Attempting to connect to the database...");
        Class.forName(className:"com.mysql.cj.jdbc.Driver");
        System.out.println(x:"MySQL JDBC Driver loaded successfully!");
        con = DriverManager.getConnection(url, uid, pw);
        System.out.println(x:"Connected to the database successfully!");
    }


    // Close the database connection
    public void close() throws SQLException {
        if (con != null) {
            con.close();
            System.out.println(x:"Connection Closed!");
        }
    }
```

```
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>  & 'C:\Program Files\Java\jdk-21\bin\java.exe' '@C:\Users\GOD\AppData\Local\Temp\cp_1g20lcaljafckyvllvrztdsch.argfile' 'assignment_jd'
Attempting to connect to the database...
MySQL JDBC Driver loaded successfully!
Connected to the database successfully!
Connection Closed!
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>
```

Connecting to RDS VIA MYSQL Workbench


Connect to Database

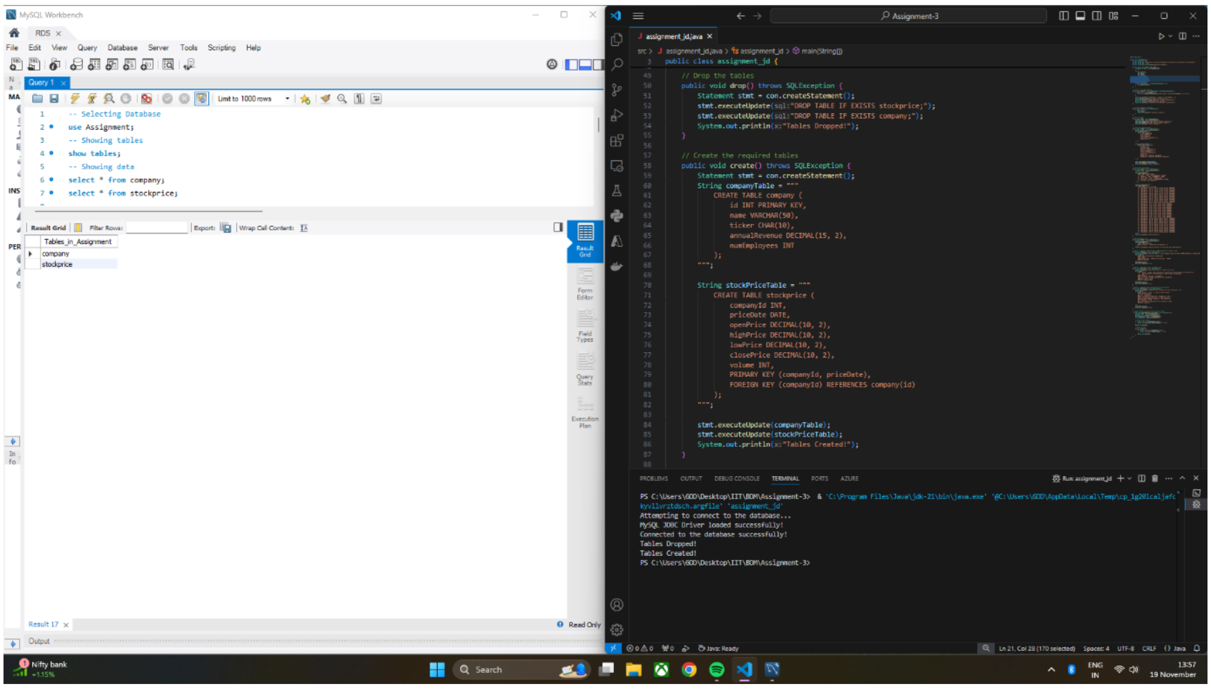
Stored Connection:	RDS	Select from saved connection settings
Connection Method:	Standard (TCP/IP)	Method to use to connect to the RDBMS

Parameters | SSL | Advanced

Hostname:	rds-jd.cfcayy4k4qbe.ap-southe Port: 3306	Name or IP address of the server host - and TCP/IP port.
Username:	JD	Name of the user to connect with.
Password:	Store in Vault ... Clear	The user's password. Will be requested later if it's not set.
Default Schema:		The schema to use as default schema. Leave blank to select it later.

OK Cancel

Creating Table and Inserting data


MySQL Workbench — RDS — Query 1

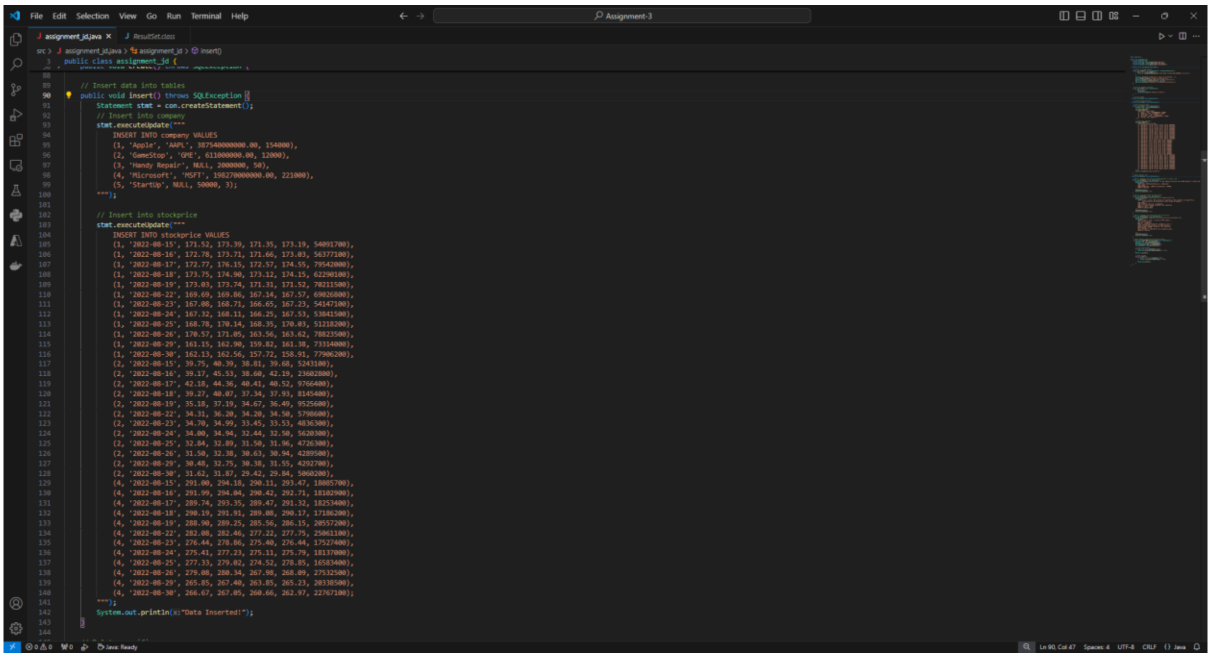
```sql
-- Selecting Database
use Assignment;
-- Showing tables
show tables;
-- Showing data
select * from company;
select * from stockprice;
```

Tables_in_Assignment
company
stockprice

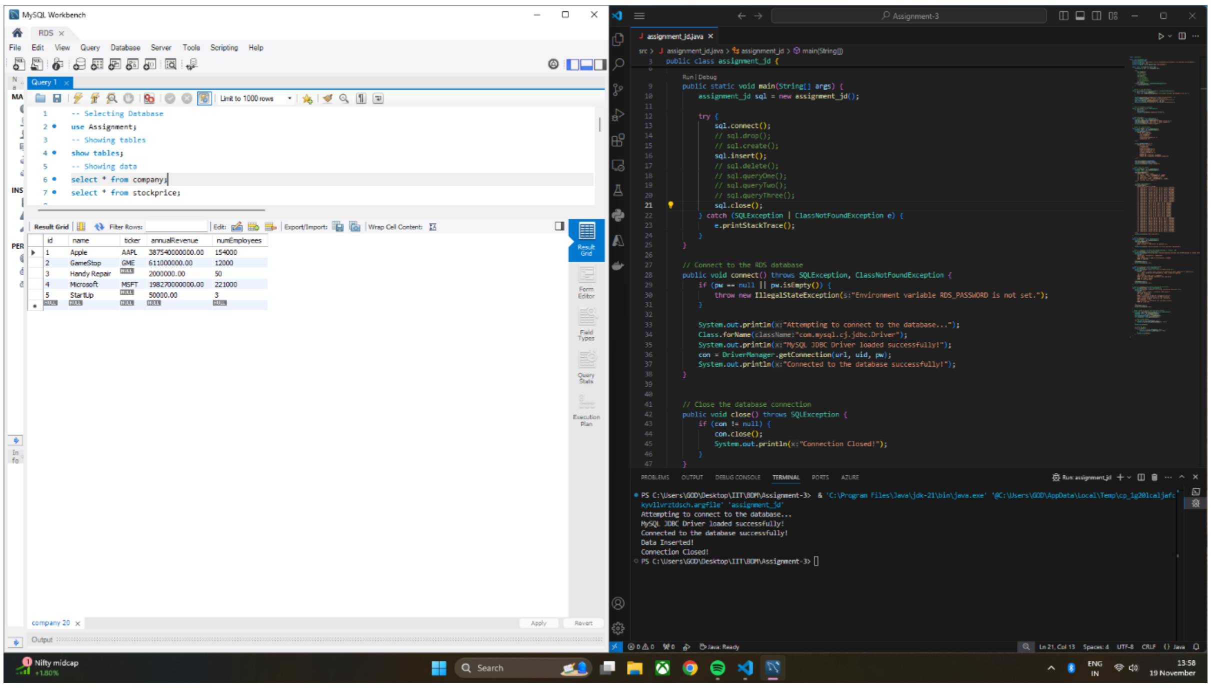
assignment_jd.java

```java
public class assignment_jd {
    // Drop the tables
    public void drop() throws SQLException {
        Statement stmt = con.createStatement();
        stmt.executeUpdate(sql:"DROP TABLE IF EXISTS stockprice;");
        stmt.executeUpdate(sql:"DROP TABLE IF EXISTS company;");
        System.out.println(x:"Tables Dropped!");
    }

    // Create the required tables
    public void create() throws SQLException {
        Statement stmt = con.createStatement();
        String companyTable = """
            CREATE TABLE company (
                id INT PRIMARY KEY,
                name VARCHAR(50),
                ticker CHAR(10),
                annualRevenue DECIMAL(15, 2),
                numEmployees INT
            );
        """;

        String stockPriceTable = """
            CREATE TABLE stockprice (
                companyId INT,
                priceDate DATE,
                openPrice DECIMAL(10, 2),
                highPrice DECIMAL(10, 2),
                lowPrice DECIMAL(10, 2),
                closePrice DECIMAL(10, 2),
                volume INT,
                PRIMARY KEY (companyId, priceDate),
                FOREIGN KEY (companyId) REFERENCES company(id)
            );
        """;

        stmt.executeUpdate(companyTable);
        stmt.executeUpdate(stockPriceTable);
        System.out.println(x:"Tables Created!");
    }
```

```
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>  & 'C:\Program Files\Java\jdk-21\bin\java.exe' '@C:\Users\GOD\AppData\Local\Temp\cp_1g20lcaljafc
kyvllvrztdsch.argfile' 'assignment_jd'
Attempting to connect to the database...
MySQL JDBC Driver loaded successfully!
Connected to the database successfully!
Tables Dropped!
Tables Created!
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>
```



```
public class assignment_jd {

    // Insert data into tables
    public void insert() throws SQLException {
        Statement stmt = con.createStatement();
        // Insert into company
        stmt.executeUpdate("""
            INSERT INTO company VALUES
            (1, 'Apple', 'AAPL', 387540000000.00, 154000),
            (2, 'GameStop', 'GME', 611000000.00, 12000),
            (3, 'Handy Repair', NULL, 2000000, 50),
            (4, 'Microsoft', 'MSFT', 198270000000.00, 221000),
            (5, 'StartUp', NULL, 50000, 3);
        """);

        // Insert into stockprice
        stmt.executeUpdate("""
            INSERT INTO stockprice VALUES
            (1, '2022-08-15', 171.52, 173.39, 171.35, 173.19, 54091700),
            (1, '2022-08-16', 172.78, 173.71, 171.66, 173.03, 56377100),
            (1, '2022-08-17', 172.77, 176.15, 172.57, 174.55, 79542000),
            (1, '2022-08-18', 173.75, 174.90, 173.12, 174.15, 62290100),
            (1, '2022-08-19', 173.03, 173.74, 171.31, 171.52, 70211500),
            (1, '2022-08-22', 169.69, 169.86, 167.14, 167.57, 69026800),
            (1, '2022-08-23', 167.08, 168.71, 166.65, 167.23, 54147100),
            (1, '2022-08-24', 167.32, 168.11, 166.25, 167.53, 53841500),
            (1, '2022-08-25', 168.78, 170.14, 168.35, 170.03, 51218200),
            (1, '2022-08-26', 170.57, 171.05, 163.56, 163.62, 78823500),
            (1, '2022-08-29', 161.15, 162.90, 159.82, 161.38, 73314000),
            (1, '2022-08-30', 162.13, 162.56, 157.72, 158.91, 77906200),
            (2, '2022-08-15', 39.75, 40.39, 38.81, 39.68, 5243100),
            (2, '2022-08-16', 39.17, 45.53, 38.60, 42.19, 23602800),
            (2, '2022-08-17', 42.18, 44.36, 40.41, 40.52, 9766400),
            (2, '2022-08-18', 39.27, 40.07, 37.34, 37.93, 8145400),
            (2, '2022-08-19', 35.18, 37.19, 34.67, 36.49, 9525600),
            (2, '2022-08-22', 34.31, 36.20, 34.20, 34.50, 5798600),
            (2, '2022-08-23', 34.70, 34.99, 33.45, 33.53, 4836300),
            (2, '2022-08-24', 34.00, 34.94, 32.44, 32.50, 5620300),
            (2, '2022-08-25', 32.84, 32.89, 31.50, 31.96, 4726300),
            (2, '2022-08-26', 31.50, 32.38, 30.63, 30.94, 4289500),
            (2, '2022-08-29', 30.48, 32.75, 30.38, 31.55, 4292700),
            (2, '2022-08-30', 31.62, 31.87, 29.42, 29.84, 5060200),
            (4, '2022-08-15', 291.00, 294.18, 290.11, 293.47, 18085700),
            (4, '2022-08-16', 291.99, 294.04, 290.42, 292.71, 18102900),
            (4, '2022-08-17', 289.74, 293.35, 289.47, 291.32, 18253400),
            (4, '2022-08-18', 290.19, 291.91, 289.08, 290.17, 17186200),
            (4, '2022-08-19', 288.90, 289.25, 285.56, 286.15, 20557200),
            (4, '2022-08-22', 282.08, 282.46, 277.22, 277.75, 25061100),
            (4, '2022-08-23', 276.44, 278.86, 275.40, 276.44, 17527400),
            (4, '2022-08-24', 275.41, 277.23, 275.11, 275.79, 18137000),
            (4, '2022-08-25', 277.33, 279.02, 274.52, 278.85, 16583400),
            (4, '2022-08-26', 279.08, 280.34, 267.98, 268.09, 27532500),
            (4, '2022-08-29', 265.85, 267.40, 263.85, 265.23, 20338500),
            (4, '2022-08-30', 266.67, 267.05, 260.66, 262.97, 22767100);
        """);
        System.out.println(x:"Data Inserted!");
    }
```

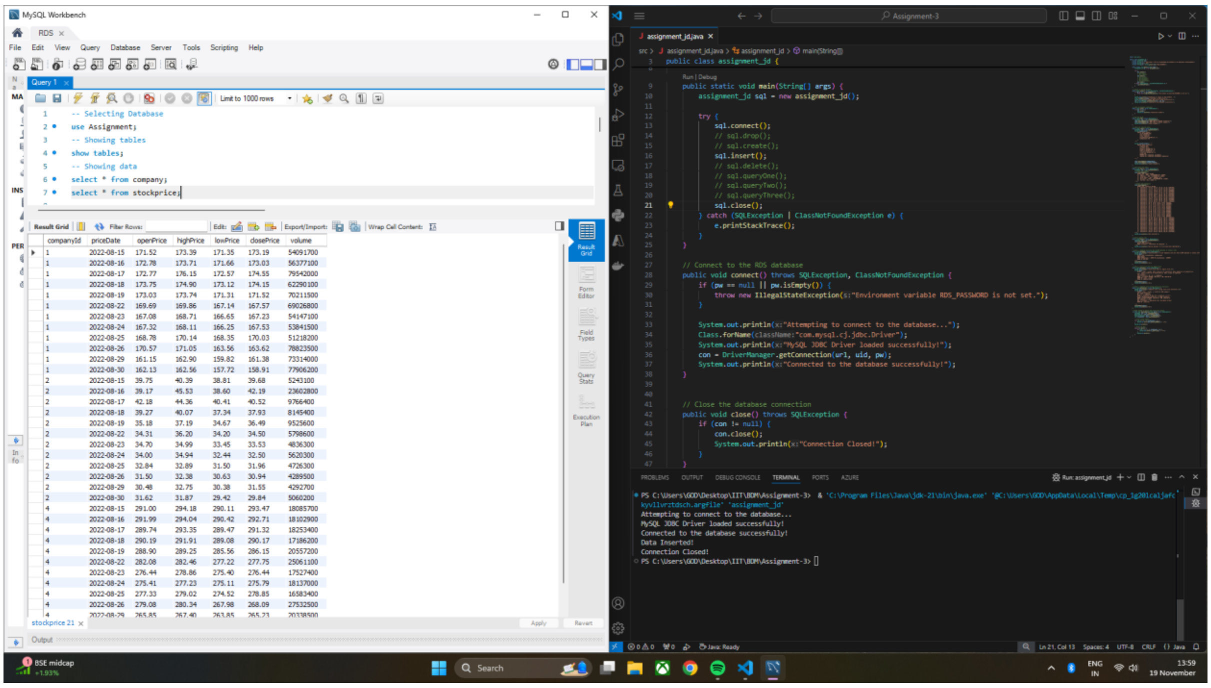


```
-- Selecting Database
use Assignment;
-- Showing tables
show tables;
-- Showing data
select * from company;
select * from stockprice;
```

	id	name	ticker	annualRevenue	numEmployees
▶	1	Apple	AAPL	387540000000.00	154000
	2	GameStop	GME	611000000.00	12000
	3	Handy Repair	NULL	2000000.00	50
	4	Microsoft	MSFT	198270000000.00	221000
	5	StartUp	NULL	50000.00	3
*	NULL	NULL	NULL	NULL	NULL

```
public class assignment_jd {

    public static void main(String[] args) {
        assignment_jd sql = new assignment_jd();

        try {
            sql.connect();
            // sql.drop();
            // sql.create();
            sql.insert();
            // sql.delete();
            // sql.queryOne();
            // sql.queryTwo();
            // sql.queryThree();
            sql.close();
        } catch (SQLException | ClassNotFoundException e) {
            e.printStackTrace();
        }
    }

    // Connect to the RDS database
    public void connect() throws SQLException, ClassNotFoundException {
        if (pw == null || pw.isEmpty()) {
            throw new IllegalStateException(s:"Environment variable RDS_PASSWORD is not set.");
        }

        System.out.println(x:"Attempting to connect to the database...");
        Class.forName(className:"com.mysql.cj.jdbc.Driver");
        System.out.println(x:"MySQL JDBC Driver loaded successfully!");
        con = DriverManager.getConnection(url, uid, pw);
        System.out.println(x:"Connected to the database successfully!");
    }


    // Close the database connection
    public void close() throws SQLException {
        if (con != null) {
            con.close();
            System.out.println(x:"Connection Closed!");
        }
    }
```

```
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>  & 'C:\Program Files\Java\jdk-21\bin\java.exe' '@C:\Users\GOD\AppData\Local\Temp\cp_1g20lcaljafc
kyvllvrztdsch.argfile' 'assignment_jd'
Attempting to connect to the database...
MySQL JDBC Driver loaded successfully!
Connected to the database successfully!
Data Inserted!
Connection Closed!
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3> 
```



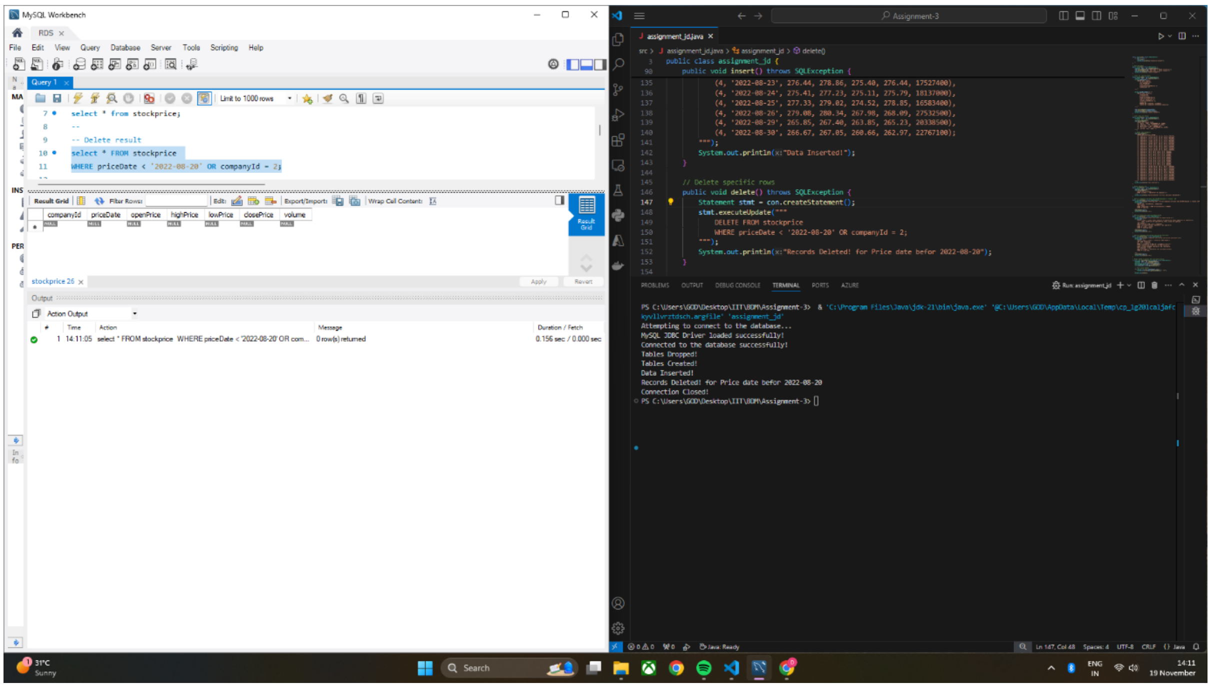
```sql
-- Selecting Database
use Assignment;
-- Showing tables
show tables;
-- Showing data
select * from company;
select * from stockprice;
```

companyId	priceDate	openPrice	highPrice	lowPrice	closePrice	volume
1	2022-08-15	171.52	173.39	171.35	173.19	54091700
1	2022-08-16	172.78	173.71	171.66	173.03	56377100
1	2022-08-17	172.77	176.15	172.57	174.55	79542000
1	2022-08-18	173.75	174.90	173.12	174.15	62290100
1	2022-08-19	173.03	173.74	171.31	171.52	70211500
1	2022-08-22	169.69	169.86	167.14	167.57	69026800
1	2022-08-23	167.08	168.71	166.65	167.23	54147100
1	2022-08-24	167.32	168.11	166.25	167.53	53841500
1	2022-08-25	168.78	170.14	168.35	170.03	51218200
1	2022-08-26	170.57	171.05	163.56	163.62	78823500
1	2022-08-29	161.15	162.90	159.82	161.38	73314000
1	2022-08-30	162.13	162.56	157.72	158.91	77906200
2	2022-08-15	39.75	40.39	38.81	39.68	5243100
2	2022-08-16	39.17	45.53	38.60	42.19	23602800
2	2022-08-17	42.18	44.36	40.41	40.52	9766400
2	2022-08-18	39.27	40.07	37.34	37.93	8145400
2	2022-08-19	35.18	37.19	34.67	36.49	9525600
2	2022-08-22	34.31	36.20	34.20	34.50	5798600
2	2022-08-23	34.70	34.99	33.45	33.53	4836300
2	2022-08-24	34.00	34.94	32.44	32.50	5620300
2	2022-08-25	32.84	32.89	31.50	31.96	4726300
2	2022-08-26	31.50	32.38	30.63	30.94	4289500
2	2022-08-29	30.48	32.75	30.38	31.55	4292700
2	2022-08-30	31.62	31.87	29.42	29.84	5060200
4	2022-08-15	291.00	294.18	290.11	293.47	18085700
4	2022-08-16	291.99	294.04	290.42	292.71	18102900
4	2022-08-17	289.74	293.35	289.47	291.32	18253400
4	2022-08-18	290.19	291.91	289.08	290.17	17186200
4	2022-08-19	288.90	289.25	285.56	286.15	20557200
4	2022-08-22	282.08	282.46	277.22	277.75	25061100
4	2022-08-23	276.44	278.86	275.40	276.44	17527400
4	2022-08-24	275.41	277.23	275.11	275.79	18137000
4	2022-08-25	277.33	279.02	274.52	278.85	16583400
4	2022-08-26	279.08	280.34	267.98	268.09	27532500
4	2022-08-29	265.85	267.40	263.85	265.23	20338500

```java
public class assignment_jd {
    public static void main(String[] args) {
        assignment_jd sql = new assignment_jd();

        try {
            sql.connect();
            // sql.drop();
            // sql.create();
            sql.insert();
            // sql.delete();
            // sql.queryOne();
            // sql.queryTwo();
            // sql.queryThree();
            sql.close();
        } catch (SQLException | ClassNotFoundException e) {
            e.printStackTrace();
        }
    }

    // Connect to the RDS database
    public void connect() throws SQLException, ClassNotFoundException {
        if (pw == null || pw.isEmpty()) {
            throw new IllegalStateException(s:"Environment variable RDS_PASSWORD is not set.");
        }

        System.out.println(x:"Attempting to connect to the database...");
        Class.forName(className:"com.mysql.cj.jdbc.Driver");
        System.out.println(x:"MySQL JDBC Driver loaded successfully!");
        con = DriverManager.getConnection(url, uid, pw);
        System.out.println(x:"Connected to the database successfully!");
    }


    // Close the database connection
    public void close() throws SQLException {
        if (con != null) {
            con.close();
            System.out.println(x:"Connection Closed!");
        }
    }
```

```
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>  & 'C:\Program Files\Java\jdk-21\bin\java.exe' '@C:\Users\GOD\AppData\Local\Temp\cp_1g20lcaljafc
kyvllvrztdsch.argfile' 'assignment_jd'
Attempting to connect to the database...
MySQL JDBC Driver loaded successfully!
Connected to the database successfully!
Data Inserted!
Connection Closed!
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>
```

Deleting Specific Data



```sql
select * from stockprice;
--
-- Delete result
select * FROM stockprice
WHERE priceDate < '2022-08-20' OR companyId = 2;
```

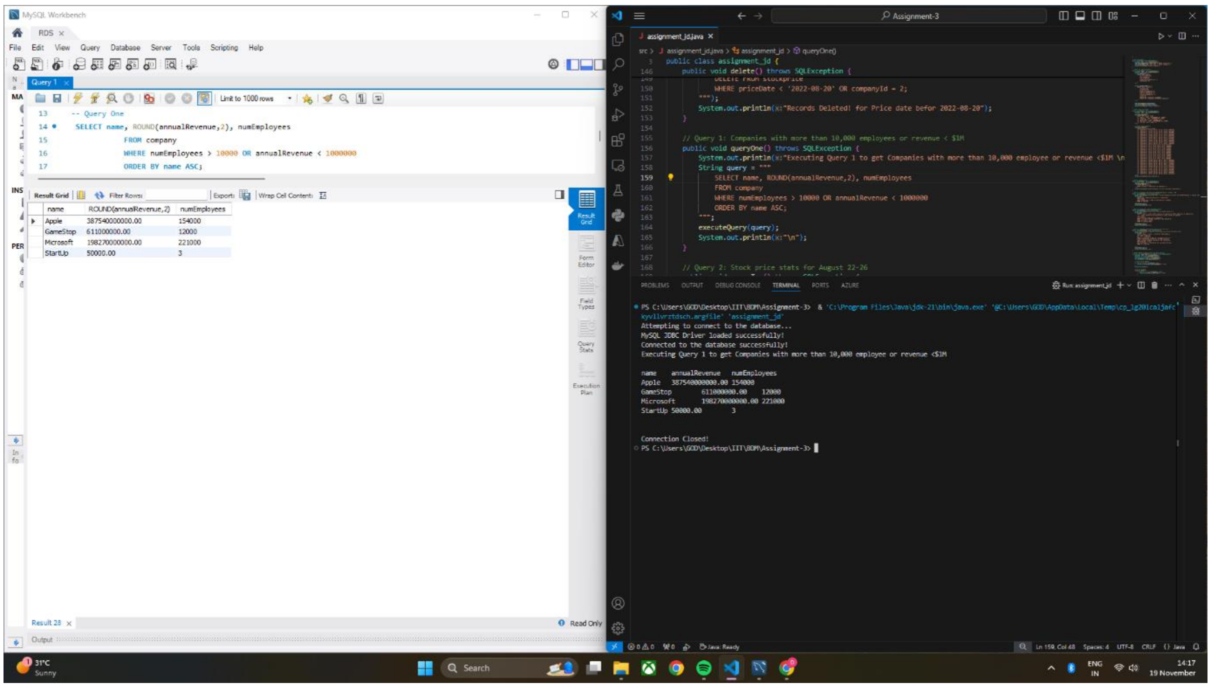
companyId	priceDate	openPrice	highPrice	lowPrice	closePrice	volume
NULL	NULL	NULL	NULL	NULL	NULL	NULL

```
#  Time      Action                                                    Message             Duration / Fetch
1  14:11:05  select * FROM stockprice  WHERE priceDate < '2022-08-20' OR com...  0 row(s) returned  0.156 sec / 0.000 sec
```

```java
public class assignment_jd {
    public void insert() throws SQLException {
                (4, '2022-08-23', 276.44, 278.86, 275.40, 276.44, 17527400),
                (4, '2022-08-24', 275.41, 277.23, 275.11, 275.79, 18137000),
                (4, '2022-08-25', 277.33, 279.02, 274.52, 278.85, 16583400),
                (4, '2022-08-26', 279.08, 280.34, 267.98, 268.09, 27532500),
                (4, '2022-08-29', 265.85, 267.40, 263.85, 265.23, 20338500),
                (4, '2022-08-30', 266.67, 267.05, 260.66, 262.97, 22767100);
            """);
        System.out.println(x:"Data Inserted!");
    }

    // Delete specific rows
    public void delete() throws SQLException {
        Statement stmt = con.createStatement();
        stmt.executeUpdate("""
            DELETE FROM stockprice
            WHERE priceDate < '2022-08-20' OR companyId = 2;
        """);
        System.out.println(x:"Records Deleted! for Price date befor 2022-08-20");
    }
```

```
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>  & 'C:\Program Files\Java\jdk-21\bin\java.exe' '@C:\Users\GOD\AppData\Local\Temp\cp_1g20lcaljafc
kyvllvrztdsch.argfile' 'assignment_jd'
Attempting to connect to the database...
MySQL JDBC Driver loaded successfully!
Connected to the database successfully!
Tables Dropped!
Tables Created!
Data Inserted!
Records Deleted! for Price date befor 2022-08-20
Connection Closed!
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>
```

Query 1



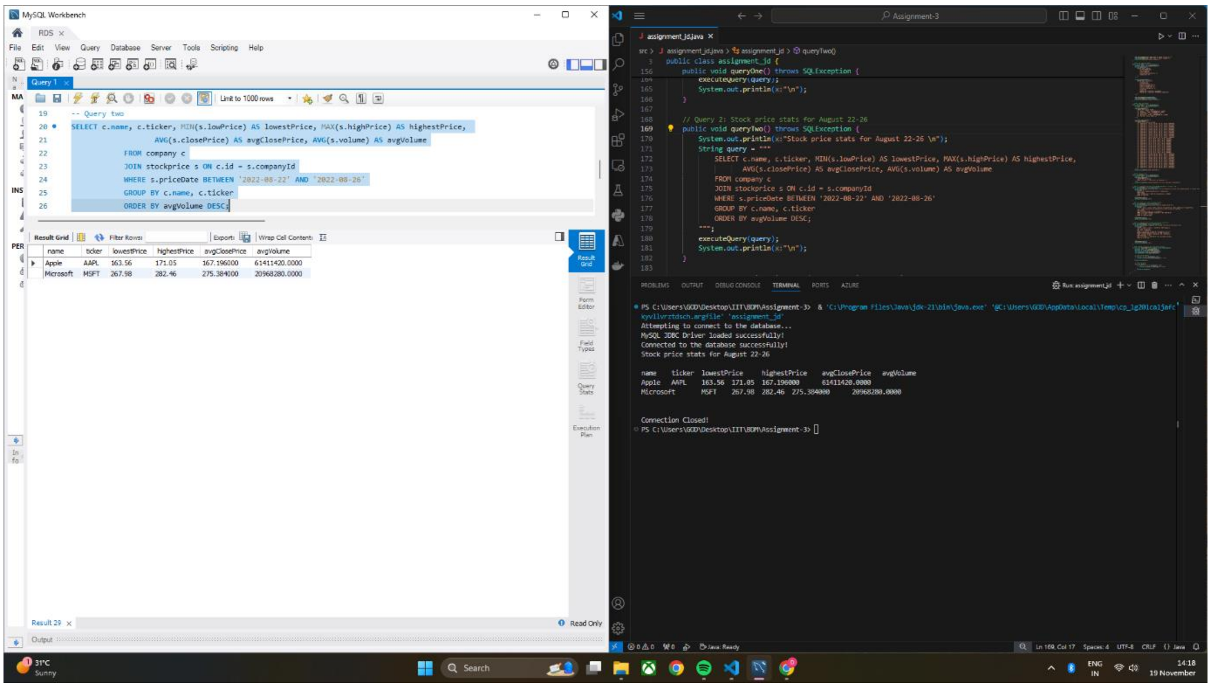
```sql
-- Query One
SELECT name, ROUND(annualRevenue,2), numEmployees
        FROM company
        WHERE numEmployees > 10000 OR annualRevenue < 1000000
        ORDER BY name ASC;
```

name	ROUND(annualRevenue,2)	numEmployees
Apple	387540000000.00	154000
GameStop	611000000.00	12000
Microsoft	198270000000.00	221000
StartUp	50000.00	3

```java
src > assignment_jd.java > assignment_jd > queryOne()
public class assignment_jd {
    public void delete() throws SQLException {
            DELETE FROM stockprice
            WHERE priceDate < '2022-08-20' OR companyId = 2;
        """);
        System.out.println(x:"Records Deleted! for Price date befor 2022-08-20");
    }

    // Query 1: Companies with more than 10,000 employees or revenue < $1M
    public void queryOne() throws SQLException {
        System.out.println(x:"Executing Query 1 to get Companies with more than 10,000 employee or revenue <$1M \n
        String query = """
            SELECT name, ROUND(annualRevenue,2), numEmployees
            FROM company
            WHERE numEmployees > 10000 OR annualRevenue < 1000000
            ORDER BY name ASC;
        """;
        executeQuery(query);
        System.out.println(x:"\n");
    }

    // Query 2: Stock price stats for August 22-26
```

```
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>  & 'C:\Program Files\Java\jdk-21\bin\java.exe' '@C:\Users\GOD\AppData\Local\Temp\cp_1g201caljafc
kyvllvrztdsch.argfile' 'assignment_jd'
Attempting to connect to the database...
MySQL JDBC Driver loaded successfully!
Connected to the database successfully!
Executing Query 1 to get Companies with more than 10,000 employee or revenue <$1M

name    annualRevenue   numEmployees
Apple   387540000000.00 154000
GameStop        611000000.00    12000
Microsoft       198270000000.00 221000
StartUp 50000.00        3


Connection Closed!
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>
```

Query 2



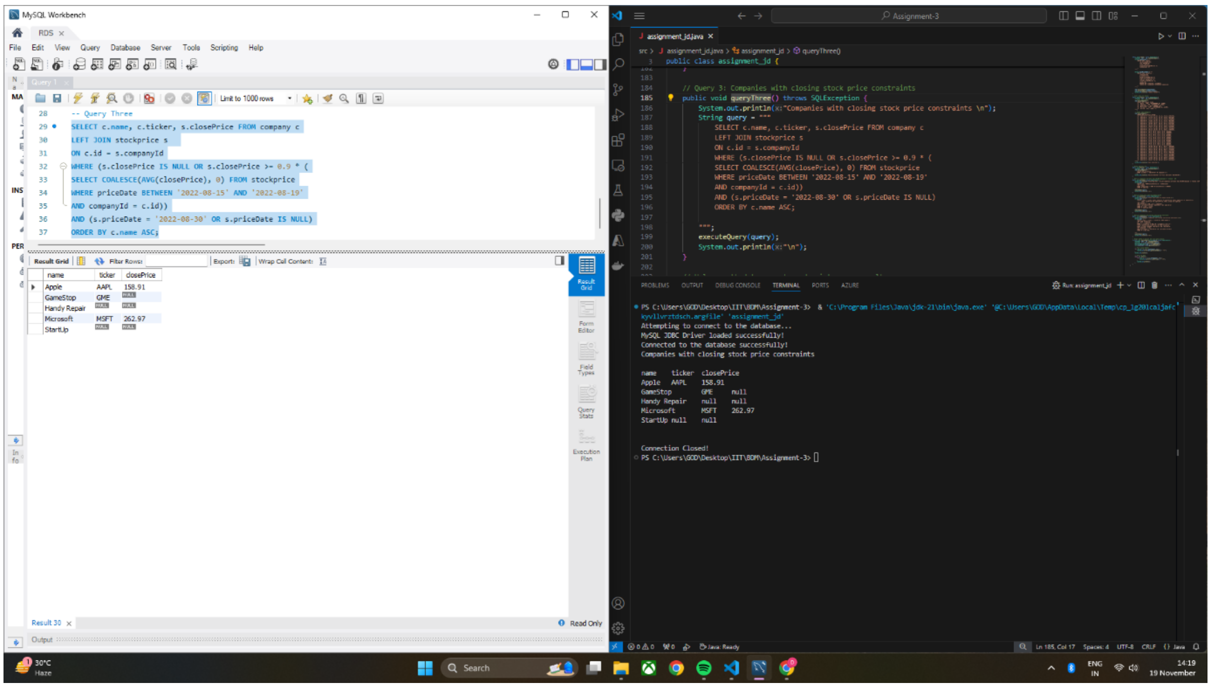
```sql
-- Query two
SELECT c.name, c.ticker, MIN(s.lowPrice) AS lowestPrice, MAX(s.highPrice) AS highestPrice,
                AVG(s.closePrice) AS avgClosePrice, AVG(s.volume) AS avgVolume
        FROM company c
        JOIN stockprice s ON c.id = s.companyId
        WHERE s.priceDate BETWEEN '2022-08-22' AND '2022-08-26'
        GROUP BY c.name, c.ticker
        ORDER BY avgVolume DESC;
```

name	ticker	lowestPrice	highestPrice	avgClosePrice	avgVolume
Apple	AAPL	163.56	171.05	167.196000	61411420.0000
Microsoft	MSFT	267.98	282.46	275.384000	20968280.0000

```java
src > assignment_jd.java > assignment_jd > queryTwo()
public class assignment_jd {
    public void queryOne() throws SQLException {
        executeQuery(query);
        System.out.println(x:"\n");
    }

    // Query 2: Stock price stats for August 22-26
    public void queryTwo() throws SQLException {
        System.out.println(x:"Stock price stats for August 22-26 \n");
        String query = """
            SELECT c.name, c.ticker, MIN(s.lowPrice) AS lowestPrice, MAX(s.highPrice) AS highestPrice,
                    AVG(s.closePrice) AS avgClosePrice, AVG(s.volume) AS avgVolume
            FROM company c
            JOIN stockprice s ON c.id = s.companyId
            WHERE s.priceDate BETWEEN '2022-08-22' AND '2022-08-26'
            GROUP BY c.name, c.ticker
            ORDER BY avgVolume DESC;
        """;
        executeQuery(query);
        System.out.println(x:"\n");
    }
```

```
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>  & 'C:\Program Files\Java\jdk-21\bin\java.exe' '@C:\Users\GOD\AppData\Local\Temp\cp_1g201caljafc
kyvllvrztdsch.argfile' 'assignment_jd'
Attempting to connect to the database...
MySQL JDBC Driver loaded successfully!
Connected to the database successfully!
Stock price stats for August 22-26

name    ticker  lowestPrice     highestPrice    avgClosePrice   avgVolume
Apple   AAPL    163.56  171.05  167.196000      61411420.0000
Microsoft       MSFT    267.98  282.46  275.384000      20968280.0000


Connection Closed!
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>
```

Query 3



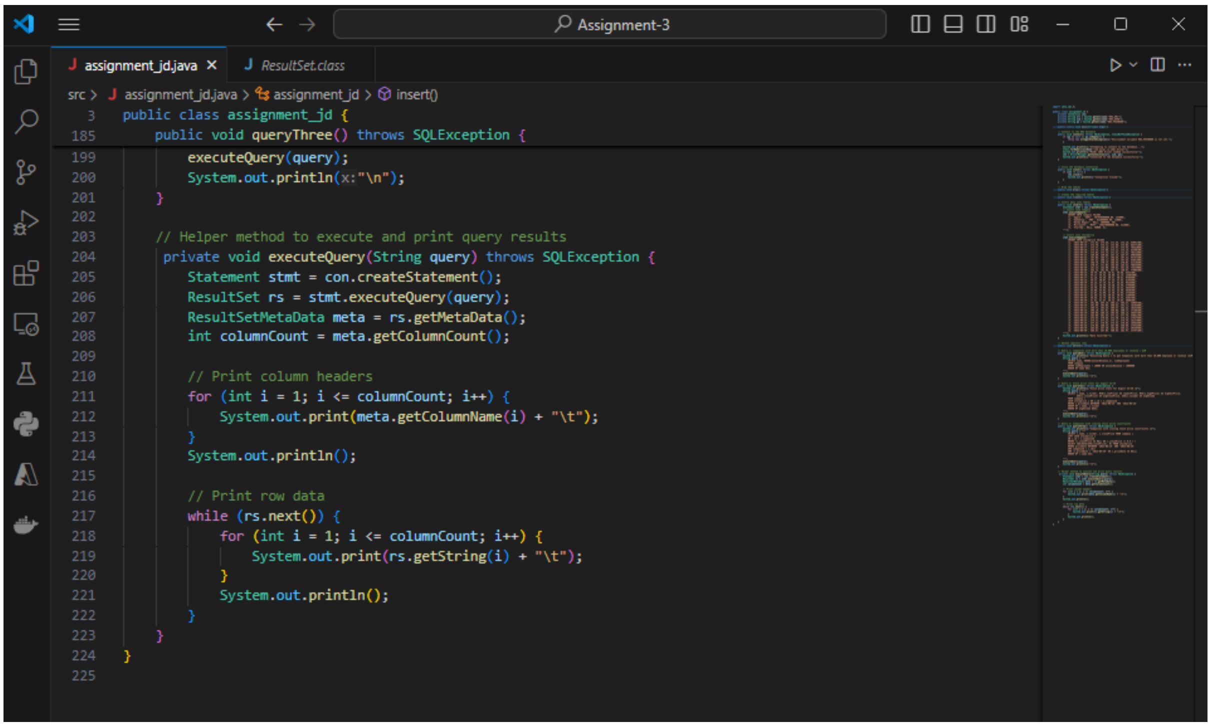
```sql
-- Query Three
SELECT c.name, c.ticker, s.closePrice FROM company c
LEFT JOIN stockprice s
ON c.id = s.companyId
WHERE (s.closePrice IS NULL OR s.closePrice >= 0.9 * (
SELECT COALESCE(AVG(closePrice), 0) FROM stockprice
WHERE priceDate BETWEEN '2022-08-15' AND '2022-08-19'
AND companyId = c.id))
AND (s.priceDate = '2022-08-30' OR s.priceDate IS NULL)
ORDER BY c.name ASC;
```

name	ticker	closePrice
Apple	AAPL	158.91
GameStop	GME	NULL
Handy Repair	NULL	NULL
Microsoft	MSFT	262.97
StartUp	NULL	NULL

```java
public class assignment_jd {
    // Query 3: Companies with closing stock price constraints
    public void queryThree() throws SQLException {
        System.out.println(x:"Companies with closing stock price constraints \n");
        String query = """
            SELECT c.name, c.ticker, s.closePrice FROM company c
            LEFT JOIN stockprice s
            ON c.id = s.companyId
            WHERE (s.closePrice IS NULL OR s.closePrice >= 0.9 * (
            SELECT COALESCE(AVG(closePrice), 0) FROM stockprice
            WHERE priceDate BETWEEN '2022-08-15' AND '2022-08-19'
            AND companyId = c.id))
            AND (s.priceDate = '2022-08-30' OR s.priceDate IS NULL)
            ORDER BY c.name ASC;

        """;
        executeQuery(query);
        System.out.println(x:"\n");
    }
```

```
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>  & 'C:\Program Files\Java\jdk-21\bin\java.exe' '@C:\Users\GOD\AppData\Local\Temp\cp_1g201caljafc
kyvllvrztdsch.argfile' 'assignment_jd'
Attempting to connect to the database...
MySQL JDBC Driver loaded successfully!
Connected to the database successfully!
Companies with closing stock price constraints

name    ticker  closePrice
Apple   AAPL    158.91
GameStop        GME     null
Handy Repair    null    null
Microsoft       MSFT    262.97
StartUp null    null


Connection Closed!
PS C:\Users\GOD\Desktop\IIT\BDM\Assignment-3>
```

Helper Class



```java
public class assignment_jd {
    public void queryThree() throws SQLException {
        executeQuery(query);
        System.out.println(x:"\n");
    }

    // Helper method to execute and print query results
    private void executeQuery(String query) throws SQLException {
        Statement stmt = con.createStatement();
        ResultSet rs = stmt.executeQuery(query);
        ResultSetMetaData meta = rs.getMetaData();
        int columnCount = meta.getColumnCount();

        // Print column headers
        for (int i = 1; i <= columnCount; i++) {
            System.out.print(meta.getColumnName(i) + "\t");
        }
        System.out.println();

        // Print row data
        while (rs.next()) {
            for (int i = 1; i <= columnCount; i++) {
                System.out.print(rs.getString(i) + "\t");
            }
            System.out.println();
        }
    }
}
```

Code :-

```
import java.sql.*;
public class assignment_jd {
   private Connection con;
   private String url = System.getenv("RDS_URL");
   private String uid = System.getenv("RDS_USER");
   private String pw = System.getenv("RDS_PASSWORD");
   public static void main(String[] args) {
      assignment_jd sql = new assignment_jd();
      try {
         sql.connect();
         sql.drop();
        sql.create();
        sql.insert();
        sql.delete();
        sql.queryOne();
        sql.queryTwo();
        sql.queryThree();
         sql.close();
      } catch (SQLException | ClassNotFoundException e) {
         e.printStackTrace();
      } }
   // Connect to the RDS database
   public void connect() throws SQLException, ClassNotFoundException {
      if (pw == null || pw.isEmpty()) {
         throw new IllegalStateException("Environment variable RDS_PASSWORD is not set.");}
      System.out.println("Attempting to connect to the database...");
      Class.forName("com.mysql.cj.jdbc.Driver");
      System.out.println("MySQL JDBC Driver loaded successfully!");
      con = DriverManager.getConnection(url, uid, pw);
      System.out.println("Connected to the database successfully!");}
```

```
// Close the database connection
public void close() throws SQLException {
    if (con != null) {
        con.close();
        System.out.println("Connection Closed!");}}
// Drop the tables
public void drop() throws SQLException {
    Statement stmt = con.createStatement();
    stmt.executeUpdate("DROP TABLE IF EXISTS stockprice;");
    stmt.executeUpdate("DROP TABLE IF EXISTS company;");
    System.out.println("Tables Dropped!"); }
// Create the required tables
public void create() throws SQLException {
    Statement stmt = con.createStatement();
    String companyTable = """
        CREATE TABLE company (
            id INT PRIMARY KEY,
            name VARCHAR(50),
            ticker CHAR(10),
            annualRevenue DECIMAL(15, 2),
            numEmployees INT);""";
    String stockPriceTable = """
        CREATE TABLE stockprice (
            companyId INT,
            priceDate DATE,
            openPrice DECIMAL(10, 2),
            highPrice DECIMAL(10, 2),
            lowPrice DECIMAL(10, 2),
            closePrice DECIMAL(10, 2),
            volume INT,
            PRIMARY KEY (companyId, priceDate),
            FOREIGN KEY (companyId) REFERENCES company(id));""";
    stmt.executeUpdate(companyTable);
    stmt.executeUpdate(stockPriceTable);
    System.out.println("Tables Created!"); }
// Insert data into tables
public void insert() throws SQLException {
    Statement stmt = con.createStatement();
    // Insert into company
    stmt.executeUpdate("""
        INSERT INTO company VALUES
        (1, 'Apple', 'AAPL', 387540000000.00, 154000),
        (2, 'GameStop', 'GME', 611000000.00, 12000),
        (3, 'Handy Repair', NULL, 2000000, 50),
        (4, 'Microsoft', 'MSFT', 198270000000.00, 221000),
        (5, 'StartUp', NULL, 50000, 3);""");
    // Insert into stockprice
    stmt.executeUpdate("""
        INSERT INTO stockprice VALUES
        (1, '2022-08-15', 171.52, 173.39, 171.35, 173.19, 54091700),
        (1, '2022-08-16', 172.78, 173.71, 171.66, 173.03, 56377100),
        (1, '2022-08-17', 172.77, 176.15, 172.57, 174.55, 79542000),
        (1, '2022-08-18', 173.75, 174.90, 173.12, 174.15, 62290100),
        (1, '2022-08-19', 173.03, 173.74, 171.31, 171.52, 70211500),
        (1, '2022-08-22', 169.69, 169.86, 167.14, 167.57, 69026800),
        (1, '2022-08-23', 167.08, 168.71, 166.65, 167.23, 54147100),
        (1, '2022-08-24', 167.32, 168.11, 166.25, 167.53, 53841500),
        (1, '2022-08-25', 168.78, 170.14, 168.35, 170.03, 51218200),
        (1, '2022-08-26', 170.57, 171.05, 163.56, 163.62, 78823500),
        (1, '2022-08-29', 161.15, 162.90, 159.82, 161.38, 73314000),
        (1, '2022-08-30', 162.13, 162.56, 157.72, 158.91, 77906200),
        (2, '2022-08-15', 39.75, 40.39, 38.81, 39.68, 5243100),
        (2, '2022-08-16', 39.17, 45.53, 38.60, 42.19, 23602800),
        (2, '2022-08-17', 42.18, 44.36, 40.41, 40.52, 9766400),
        (2, '2022-08-18', 39.27, 40.07, 37.34, 37.93, 8145400),
        (2, '2022-08-19', 35.18, 37.19, 34.67, 36.49, 9525600),
        (2, '2022-08-22', 34.31, 36.20, 34.20, 34.50, 5798600),
        (2, '2022-08-23', 34.70, 34.99, 33.45, 33.53, 4836300),
        (2, '2022-08-24', 34.00, 34.94, 32.44, 32.50, 5620300),
        (2, '2022-08-25', 32.84, 32.89, 31.50, 31.96, 4726300),
        (2, '2022-08-26', 31.50, 32.38, 30.63, 30.94, 4289500),
        (2, '2022-08-29', 30.48, 32.75, 30.38, 31.55, 4292700),
        (2, '2022-08-30', 31.62, 31.87, 29.42, 29.84, 5060200),
        (4, '2022-08-15', 291.00, 294.18, 290.11, 293.47, 18085700),
        (4, '2022-08-16', 291.99, 294.04, 290.42, 292.71, 18102900),
        (4, '2022-08-17', 289.74, 293.35, 289.47, 291.32, 18253400),
        (4, '2022-08-18', 290.19, 291.91, 289.08, 290.17, 17186200),
        (4, '2022-08-19', 288.90, 289.25, 285.56, 286.15, 20557200),
        (4, '2022-08-22', 282.08, 282.46, 277.22, 277.75, 25061100),
        (4, '2022-08-23', 276.44, 278.86, 275.40, 276.44, 17527400),
        (4, '2022-08-24', 275.41, 277.23, 275.11, 275.79, 18137000),
        (4, '2022-08-25', 277.33, 279.02, 274.52, 278.85, 16583400),
        (4, '2022-08-26', 279.08, 280.34, 267.98, 268.09, 27532500),
        (4, '2022-08-29', 265.85, 267.40, 263.85, 265.23, 20338500),
        (4, '2022-08-30', 266.67, 267.05, 260.66, 262.97, 22767100); """);
    System.out.println("Data Inserted!");}
// Delete specific rows
public void delete() throws SQLException {
    Statement stmt = con.createStatement();
    stmt.executeUpdate("""
        DELETE FROM stockprice WHERE priceDate < '2022-08-20' OR companyId = 2; """);
    System.out.println("Records Deleted! for Price date befor 2022-08-20"); }
// Query 1: Companies with more than 10,000 employees or revenue < $1M
```

```
    public void queryOne() throws SQLException {
        System.out.println("Executing Query 1 to get Companies with more than 10,000 employee or
revenue <$1M \n");
        String query = """
            SELECT name, ROUND(annualRevenue,2), numEmployees FROM company
            WHERE numEmployees > 10000 OR annualRevenue < 1000000
            ORDER BY name ASC; """;
        executeQuery(query);
        System.out.println("\n");}
    // Query 2: Stock price stats for August 22-26
    public void queryTwo() throws SQLException {
        System.out.println("Stock price stats for August 22-26 \n");
        String query = """
            SELECT c.name, c.ticker, MIN(s.lowPrice) AS lowestPrice, MAX(s.highPrice) AS
highestPrice,  AVG(s.closePrice) AS avgClosePrice, AVG(s.volume) AS avgVolume FROM company c JOIN
stockprice s ON c.id = s.companyId WHERE s.priceDate BETWEEN '2022-08-22' AND '2022-08-26'
GROUP BY c.name, c.ticker ORDER BY avgVolume DESC; """;
        executeQuery(query);
        System.out.println("\n"); }
    // Query 3: Companies with closing stock price constraints
    public void queryThree() throws SQLException {
        System.out.println("Companies with closing stock price constraints \n");
        String query = """
            SELECT c.name, c.ticker, s.closePrice FROM company c LEFT JOIN stockprice s
            ON c.id = s.companyId WHERE (s.closePrice IS NULL OR s.closePrice >= 0.9 * (
            SELECT COALESCE(AVG(closePrice), 0) FROM stockprice WHERE priceDate BETWEEN '2022-08-
15' AND '2022-08-19' AND companyId = c.id)) AND (s.priceDate = '2022-08-30' OR s.priceDate IS NULL)
ORDER BY c.name ASC; """;
        executeQuery(query);
        System.out.println("\n");}
    // Helper method to execute and print query results
     private void executeQuery(String query) throws SQLException {
        Statement stmt = con.createStatement();
        ResultSet rs = stmt.executeQuery(query);
        ResultSetMetaData meta = rs.getMetaData();
        int columnCount = meta.getColumnCount();
        // Print column headers
        for (int i = 1; i <= columnCount; i++) {
            System.out.print(meta.getColumnName(i) + "\t");
        }
        System.out.println();
        // Print row data
        while (rs.next()) {
            for (int i = 1; i <= columnCount; i++) {
                System.out.print(rs.getString(i) + "\t");
            }
            System.out.println();
        }
    }
}
```