**MySQL Answer to the Questions**

**Q1. SELECT clause with WHERE, AND, DISTINCT, Wild Card (LIKE)**

**A 🡪**

mysql> Select distinct employeeNumber, firstname, lastname from employees where jobTitle = 'Sales Rep' and reportsTo = 1102;

+----------------+-----------+-----------+

| employeeNumber | firstname | lastname |

+----------------+-----------+-----------+

| 1337 | Loui | Bondur |

| 1370 | Gerard | Hernandez |

| 1401 | Pamela | Castillo |

| 1501 | Larry | Bott |

| 1504 | Barry | Jones |

| 1702 | Martin | Gerard |

+----------------+-----------+-----------+

6 rows in set (0.02 sec)

**B 🡪**

mysql> select distinct productline from products where productline like '%cars';

+--------------+

| productline |

+--------------+

| Classic Cars |

| Vintage Cars |

+--------------+

2 rows in set (0.01 sec)

**Q2. CASE STATEMENTS for Segmentation**

**A 🡪**

mysql> SELECT customerNumber, customerName, CASE WHEN country IN ('USA', 'Canada') THEN 'North America' WHEN country IN ('UK', 'France', 'Germany') THEN 'Europe' ELSE 'Other’ END AS CustomerSegment FROM customers;

+----------------+------------------------------------+-----------------+

| customerNumber | customerName | CustomerSegment |

+----------------+------------------------------------+-----------------+

| 103 | Atelier graphique | Europe |

| 112 | Signal Gift Stores | North America |

| 114 | Australian Collectors, Co. | Other |

| 119 | La Rochelle Gifts | Europe |

| 121 | Baane Mini Imports | Other |

| 124 | Mini Gifts Distributors Ltd. | North America |

| 125 | Havel & Zbyszek Co | Other |

| 128 | Blauer See Auto, Co. | Europe |

| 129 | Mini Wheels Co. | North America |

| 131 | Land of Toys Inc. | North America |

| 141 | Euro+ Shopping Channel | Other |

| 144 | Volvo Model Replicas, Co | Other |

| 145 | Danish Wholesale Imports | Other |

| 146 | Saveley & Henriot, Co. | Europe |

| 148 | Dragon Souveniers, Ltd. | Other |

| 151 | Muscle Machine Inc | North America |

| 157 | Diecast Classics Inc. | North America |

| 161 | Technics Stores Inc. | North America |

| 166 | Handji Gifts& Co | Other |

| 167 | Herkku Gifts | Other |

| 168 | American Souvenirs Inc | North America |

| 169 | Porto Imports Co. | Other |

| 171 | Daedalus Designs Imports | Europe |

| 172 | La Corne D'abondance, Co. | Europe |

| 173 | Cambridge Collectables Co. | North America |

| 175 | Gift Depot Inc. | North America |

| 177 | Osaka Souveniers Co. | Other |

| 181 | Vitachrome Inc. | North America |

| 186 | Toys of Finland, Co. | Other |

| 187 | AV Stores, Co. | Europe |

| 189 | Clover Collections, Co. | Other |

| 198 | Auto-Moto Classics Inc. | North America |

| 201 | UK Collectables, Ltd. | Europe |

| 202 | Canadian Gift Exchange Network | North America |

| 204 | Online Mini Collectables | North America |

| 205 | Toys4GrownUps.com | North America |

| 206 | Asian Shopping Network, Co | Other |

| 209 | Mini Caravy | Europe |

| 211 | King Kong Collectables, Co. | Other |

| 216 | Enaco Distributors | Other |

| 219 | Boards & Toys Co. | North America |

| 223 | Natürlich Autos | Europe |

| 227 | Heintze Collectables | Other |

| 233 | Québec Home Shopping Network | North America |

| 237 | ANG Resellers | Other |

| 239 | Collectable Mini Designs Co. | North America |

| 240 | giftsbymail.co.uk | Europe |

| 242 | Alpha Cognac | Europe |

| 247 | Messner Shopping Network | Europe |

| 249 | Amica Models & Co. | Other |

| 250 | Lyon Souveniers | Europe |

| 256 | Auto Associés & Cie. | Europe |

| 259 | Toms Spezialitäten, Ltd | Europe |

| 260 | Royal Canadian Collectables, Ltd. | North America |

| 273 | Franken Gifts, Co | Europe |

| 276 | Anna's Decorations, Ltd | Other |

| 278 | Rovelli Gifts | Other |

| 282 | Souveniers And Things Co. | Other |

| 286 | Marta's Replicas Co. | North America |

| 293 | BG&E Collectables | Other |

| 298 | Vida Sport, Ltd | Other |

| 299 | Norway Gifts By Mail, Co. | Other |

| 303 | Schuyler Imports | Other |

| 307 | Der Hund Imports | Europe |

| 311 | Oulu Toy Supplies, Inc. | Other |

| 314 | Petit Auto | Other |

| 319 | Mini Classics | North America |

| 320 | Mini Creations Ltd. | North America |

| 321 | Corporate Gift Ideas Co. | North America |

| 323 | Down Under Souveniers, Inc | Other |

| 324 | Stylish Desk Decors, Co. | Europe |

| 328 | Tekni Collectables Inc. | North America |

| 333 | Australian Gift Network, Co | Other |

| 334 | Suominen Souveniers | Other |

| 335 | Cramer Spezialitäten, Ltd | Europe |

| 339 | Classic Gift Ideas, Inc | North America |

| 344 | CAF Imports | Other |

| 347 | Men 'R' US Retailers, Ltd. | North America |

| 348 | Asian Treasures, Inc. | Other |

| 350 | Marseille Mini Autos | Europe |

| 353 | Reims Collectables | Europe |

| 356 | SAR Distributors, Co | Other |

| 357 | GiftsForHim.com | Other |

| 361 | Kommission Auto | Europe |

| 362 | Gifts4AllAges.com | North America |

| 363 | Online Diecast Creations Co. | North America |

| 369 | Lisboa Souveniers, Inc | Other |

| 376 | Precious Collectables | Other |

| 379 | Collectables For Less Inc. | North America |

| 381 | Royale Belge | Other |

| 382 | Salzburg Collectables | Other |

| 385 | Cruz & Sons Co. | Other |

| 386 | L'ordine Souveniers | Other |

| 398 | Tokyo Collectables, Ltd | Other |

| 406 | Auto Canal+ Petit | Europe |

| 409 | Stuttgart Collectable Exchange | Europe |

| 412 | Extreme Desk Decorations, Ltd | Other |

| 415 | Bavarian Collectables Imports, Co. | Europe |

| 424 | Classic Legends Inc. | North America |

| 443 | Feuer Online Stores, Inc | Europe |

| 447 | Gift Ideas Corp. | North America |

| 448 | Scandinavian Gift Ideas | Other |

| 450 | The Sharp Gifts Warehouse | North America |

| 452 | Mini Auto Werke | Other |

| 455 | Super Scale Inc. | North America |

| 456 | Microscale Inc. | North America |

| 458 | Corrida Auto Replicas, Ltd | Other |

| 459 | Warburg Exchange | Europe |

| 462 | FunGiftIdeas.com | North America |

| 465 | Anton Designs, Ltd. | Other |

| 471 | Australian Collectables, Ltd | Other |

| 473 | Frau da Collezione | Other |

| 475 | West Coast Collectables Co. | North America |

| 477 | Mit Vergnügen & Co. | Europe |

| 480 | Kremlin Collectables, Co. | Other |

| 481 | Raanan Stores, Inc | Other |

| 484 | Iberia Gift Imports, Corp. | Other |

| 486 | Motor Mint Distributors Inc. | North America |

| 487 | Signal Collectibles Ltd. | North America |

| 489 | Double Decker Gift Stores, Ltd | Europe |

| 495 | Diecast Collectables | North America |

| 496 | Kelly's Gift Shop | Other |

+----------------+------------------------------------+-----------------+

122 rows in set (0.00 sec)

**Q3. Group By with Aggregation functions and Having clause, Date and Time functions**

**A 🡪**

mysql> SELECT productCode, SUM(quantityOrdered) AS totalQuantity FROM orderdetails GROUP BY productCode ORDER BY totalQuantity DESC LIMIT 10;

+-------------+---------------+

| productCode | totalQuantity |

+-------------+---------------+

| S18\_3232 | 1808 |

| S18\_1342 | 1111 |

| S700\_4002 | 1085 |

| S18\_3856 | 1076 |

| S50\_1341 | 1074 |

| S18\_4600 | 1061 |

| S10\_1678 | 1057 |

| S12\_4473 | 1056 |

| S18\_2319 | 1053 |

| S24\_3856 | 1052 |

+-------------+---------------+

10 rows in set (0.02 sec)

**B 🡪**

mysql> SELECT MONTHNAME(paymentDate) AS month, COUNT(\*) AS totalPayments FROM payments GROUP BY month HAVING totalPayments > 20 ORDER BY totalPayments DESC;

+----------+---------------+

| month | totalPayments |

+----------+---------------+

| December | 43 |

| November | 42 |

| March | 24 |

| May | 23 |

| April | 22 |

+----------+---------------+

5 rows in set (0.01 sec)

**Q4. CONSTRAINTS: Primary, key, foreign key, Unique, check, not null, default**

**A 🡪**

mysql> CREATE DATABASE Customers\_Orders;

Query OK, 1 row affected (0.01 sec)

mysql> USE Customers\_Orders;

Database changed

mysql> CREATE TABLE Customers (

-> customer\_id INT AUTO\_INCREMENT PRIMARY KEY,

-> first\_name VARCHAR(50) NOT NULL,

-> last\_name VARCHAR(50) NOT NULL,

-> email VARCHAR(255) UNIQUE,

-> phone\_number VARCHAR(20));

Query OK, 0 rows affected (0.04 sec)

mysql> desc customers;

+--------------+--------------+------+-----+---------+----------------+

| Field | Type | Null | Key | Default | Extra |

+--------------+--------------+------+-----+---------+----------------+

| customer\_id | int | NO | PRI | NULL | auto\_increment |

| first\_name | varchar(50) | NO | | NULL | |

| last\_name | varchar(50) | NO | | NULL | |

| email | varchar(255) | YES | UNI | NULL | |

| phone\_number | varchar(20) | YES | | NULL | |

+--------------+--------------+------+-----+---------+----------------+

5 rows in set (0.01 sec)

**B 🡪**

mysql> CREATE TABLE Orders (order\_id INT AUTO\_INCREMENT PRIMARY KEY, customer\_id INT, order\_date DATE, total\_amount DECIMAL(10,2), FOREIGN KEY (customer\_id) REFERENCES Customers(customer\_id), CHECK (total\_amount >= 0));

Query OK, 0 rows affected (0.04 sec)

mysql> desc orders;

+--------------+---------------+------+-----+---------+----------------+

| Field | Type | Null | Key | Default | Extra |

+--------------+---------------+------+-----+---------+----------------+

| order\_id | int | NO | PRI | NULL | auto\_increment |

| customer\_id | int | YES | MUL | NULL | |

| order\_date | date | YES | | NULL | |

| total\_amount | decimal(10,2) | YES | | NULL | |

+--------------+---------------+------+-----+---------+----------------+

4 rows in set (0.00 sec)

**Q5. JOINS**

**A 🡪**

mysql> SELECT c.country, COUNT(o.orderNumber) AS order\_count

-> FROM Customers c

-> JOIN Orders o ON c.customerNumber = o.customerNumber

-> GROUP BY c.country

-> ORDER BY order\_count DESC

-> LIMIT 5;

+-------------+-------------+

| country | order\_count |

+-------------+-------------+

| USA | 112 |

| France | 37 |

| Spain | 36 |

| Australia | 19 |

| New Zealand | 15 |

+-------------+-------------+

5 rows in set (0.05 sec)

**Q6. SELF JOIN**

mysql> CREATE TABLE project (

-> EmployeeID INT AUTO\_INCREMENT PRIMARY KEY,

-> FullName VARCHAR(50) NOT NULL,

-> Gender ENUM('Male', 'Female'),

-> ManagerID INT);

Query OK, 0 rows affected (0.06 sec)

mysql> INSERT INTO project (FullName, Gender, ManagerID) VALUES

-> ('Pranaya', 'Male', 3),

-> ('Priyanka', 'Female', 1),

-> ('Preety', 'Female', NULL),

-> ('Anurag', 'Male', 1),

-> ('Sambit', 'Male', 1),

-> ('Rajesh', 'Male', 3),

-> ('Hina', 'Female', 3);

Query OK, 7 rows affected (0.01 sec)

Records: 7 Duplicates: 0 Warnings: 0

mysql> select \* from project;

+------------+----------+--------+-----------+

| EmployeeID | FullName | Gender | ManagerID |

+------------+----------+--------+-----------+

| 1 | Pranaya | Male | 3 |

| 2 | Priyanka | Female | 1 |

| 3 | Preety | Female | NULL |

| 4 | Anurag | Male | 1 |

| 5 | Sambit | Male | 1 |

| 6 | Rajesh | Male | 3 |

| 7 | Hina | Female | 3 |

+------------+----------+--------+-----------+

7 rows in set (0.00 sec)

mysql> SELECT m.FullName AS Manager, e.FullName AS Employee

-> FROM project e

-> JOIN project m ON e.ManagerID = m.EmployeeID

-> Where e.ManagerID IS NOT NULL;

+---------+----------+

| Manager | Employee |

+---------+----------+

| Pranaya | Priyanka |

| Pranaya | Anurag |

| Pranaya | Sambit |

| Preety | Pranaya |

| Preety | Rajesh |

| Preety | Hina |

+---------+----------+

6 rows in set (0.00 sec)

**Q7. DDL Commands: Create, Alter, Rename**

**A 🡪**

mysql> CREATE TABLE facility (

-> Facility\_ID INT,

-> Name VARCHAR(255),

-> State VARCHAR(255),

-> Country VARCHAR(255));

Query OK, 0 rows affected (0.03 sec)

1. 🡪

mysql> ALTER TABLE facility

-> MODIFY COLUMN Facility\_ID INT AUTO\_INCREMENT PRIMARY KEY;

Query OK, 0 rows affected (0.06 sec)

Records: 0 Duplicates: 0 Warnings: 0

1. 🡪

mysql> ALTER TABLE facility

-> ADD COLUMN city VARCHAR(255) NOT NULL AFTER Name;

Query OK, 0 rows affected (0.02 sec)

Records: 0 Duplicates: 0 Warnings: 0

mysql> desc facility;

+-------------+--------------+------+-----+---------+----------------+

| Field | Type | Null | Key | Default | Extra |

+-------------+--------------+------+-----+---------+----------------+

| Facility\_ID | int | NO | PRI | NULL | auto\_increment |

| Name | varchar(255) | YES | | NULL | |

| city | varchar(255) | NO | | NULL | |

| State | varchar(255) | YES | | NULL | |

| Country | varchar(255) | YES | | NULL | |

+-------------+--------------+------+-----+---------+----------------+

5 rows in set (0.00 sec)

**Q8. Views in SQL**

mysql> CREATE VIEW product\_category\_sales AS

-> SELECT pl.productLine,

-> SUM(od.quantityOrdered \* od.priceEach) AS total\_sales,

-> COUNT(DISTINCT o.orderNumber) AS number\_of\_orders

-> FROM Products p

-> JOIN ProductLines pl ON p.productLine = pl.productLine

-> JOIN OrderDetails od ON p.productCode = od.productCode

-> JOIN Orders o ON od.orderNumber = o.orderNumber

-> GROUP BY pl.productLine;

Query OK, 0 rows affected (0.02 sec)

mysql>

mysql> select \* from product\_category\_sales;

+------------------+-------------+------------------+

| productLine | total\_sales | number\_of\_orders |

+------------------+-------------+------------------+

| Classic Cars | 3853922.49 | 209 |

| Motorcycles | 1121426.12 | 79 |

| Planes | 954637.54 | 66 |

| Ships | 663998.34 | 68 |

| Trains | 188532.92 | 47 |

| Trucks and Buses | 1024113.57 | 75 |

| Vintage Cars | 1797559.63 | 187 |

+------------------+-------------+------------------+

7 rows in set (0.05 sec)

**Q9. Stored Procedures in SQL with parameters**

**CREATE DEFINER=`root`@`localhost`**

**PROCEDURE `Get\_country\_payments\_1`(IN input\_year INT, IN input\_country VARCHAR(50))**

**BEGIN**

**SELECT**

**YEAR(paymentDate) AS Year,**

**c.country,**

**CONCAT(FORMAT(SUM(p.amount) / 1000, 0), 'K') AS TotalAmount**

**FROM**

**Customers c**

**JOIN**

**Payments p ON c.customer\_id = p.customer\_id**

**WHERE**

**YEAR(p.paymentDate) = input\_year**

**AND c.country = input\_country**

**GROUP BY**

**Year, c.country;**

**END**

**mysql> CALL Get\_country\_payments(2003, 'France');**

**+------+---------+--------------+**

**| Year | country | total\_amount |**

**+------+---------+--------------+**

**| 2003 | France | 283000 |**

**+------+---------+--------------+**

**1 row in set (0.03 sec)**

**Query OK, 0 rows affected (0.03 sec)**

**Q10. Window functions - Rank dense\_rank lead and lag**

**A 🡪**

**mysql> SELECT c.customerNumber, c.customerName, COUNT(o.orderNumber) AS order\_count,**

**->RANK() OVER (ORDER BY COUNT(o.orderNumber) DESC) AS customer\_rank**

**-> FROM Customers c**

**-> JOIN Orders o ON c.customerNumber = o.customerNumber**

**-> GROUP BY c.customerNumber, c.customerName**

**-> ORDER BY order\_count DESC;**

**+----------------+------------------------------------+-------------+---------------+**

**| customerNumber | customerName | order\_count | customer\_rank |**

**+----------------+------------------------------------+-------------+---------------+**

**| 141 | Euro+ Shopping Channel | 26 | 1 |**

**| 124 | Mini Gifts Distributors Ltd. | 17 | 2 |**

**| 114 | Australian Collectors, Co. | 5 | 3 |**

**| 353 | Reims Collectables | 5 | 3 |**

**| 145 | Danish Wholesale Imports | 5 | 3 |**

**| 148 | Dragon Souveniers, Ltd. | 5 | 3 |**

**| 323 | Down Under Souveniers, Inc | 5 | 3 |**

**| 381 | Royale Belge | 4 | 8 |**

**| 276 | Anna's Decorations, Ltd | 4 | 8 |**

**| 119 | La Rochelle Gifts | 4 | 8 |**

**| 121 | Baane Mini Imports | 4 | 8 |**

**| 128 | Blauer See Auto, Co. | 4 | 8 |**

**| 131 | Land of Toys Inc. | 4 | 8 |**

**| 144 | Volvo Model Replicas, Co | 4 | 8 |**

**| 496 | Kelly's Gift Shop | 4 | 8 |**

**| 151 | Muscle Machine Inc | 4 | 8 |**

**| 157 | Diecast Classics Inc. | 4 | 8 |**

**| 161 | Technics Stores Inc. | 4 | 8 |**

**| 166 | Handji Gifts& Co | 4 | 8 |**

**| 450 | The Sharp Gifts Warehouse | 4 | 8 |**

**| 282 | Souveniers And Things Co. | 4 | 8 |**

**| 398 | Tokyo Collectables, Ltd | 4 | 8 |**

**| 382 | Salzburg Collectables | 4 | 8 |**

**| 321 | Corporate Gift Ideas Co. | 4 | 8 |**

**| 103 | Atelier graphique | 3 | 25 |**

**| 112 | Signal Gift Stores | 3 | 25 |**

**| 129 | Mini Wheels Co. | 3 | 25 |**

**| 167 | Herkku Gifts | 3 | 25 |**

**| 448 | Scandinavian Gift Ideas | 3 | 25 |**

**| 172 | La Corne D'abondance, Co. | 3 | 25 |**

**| 452 | Mini Auto Werke | 3 | 25 |**

**| 175 | Gift Depot Inc. | 3 | 25 |**

**| 333 | Australian Gift Network, Co | 3 | 25 |**

**| 181 | Vitachrome Inc. | 3 | 25 |**

**| 186 | Toys of Finland, Co. | 3 | 25 |**

**| 187 | AV Stores, Co. | 3 | 25 |**

**| 458 | Corrida Auto Replicas, Ltd | 3 | 25 |**

**| 198 | Auto-Moto Classics Inc. | 3 | 25 |**

**| 201 | UK Collectables, Ltd. | 3 | 25 |**

**| 462 | FunGiftIdeas.com | 3 | 25 |**

**| 471 | Australian Collectables, Ltd | 3 | 25 |**

**| 205 | Toys4GrownUps.com | 3 | 25 |**

**| 209 | Mini Caravy | 3 | 25 |**

**| 486 | Motor Mint Distributors Inc. | 3 | 25 |**

**| 216 | Enaco Distributors | 3 | 25 |**

**| 233 | Québec Home Shopping Network | 3 | 25 |**

**| 242 | Alpha Cognac | 3 | 25 |**

**| 250 | Lyon Souveniers | 3 | 25 |**

**| 278 | Rovelli Gifts | 3 | 25 |**

**| 146 | Saveley & Henriot, Co. | 3 | 25 |**

**| 311 | Oulu Toy Supplies, Inc. | 3 | 25 |**

**| 314 | Petit Auto | 3 | 25 |**

**| 320 | Mini Creations Ltd. | 3 | 25 |**

**| 324 | Stylish Desk Decors, Co. | 3 | 25 |**

**| 328 | Tekni Collectables Inc. | 3 | 25 |**

**| 334 | Suominen Souveniers | 3 | 25 |**

**| 350 | Marseille Mini Autos | 3 | 25 |**

**| 357 | GiftsForHim.com | 3 | 25 |**

**| 362 | Gifts4AllAges.com | 3 | 25 |**

**| 363 | Online Diecast Creations Co. | 3 | 25 |**

**| 379 | Collectables For Less Inc. | 3 | 25 |**

**| 385 | Cruz & Sons Co. | 3 | 25 |**

**| 386 | L'ordine Souveniers | 3 | 25 |**

**| 406 | Auto Canal+ Petit | 3 | 25 |**

**| 412 | Extreme Desk Decorations, Ltd | 3 | 25 |**

**| 424 | Classic Legends Inc. | 3 | 25 |**

**| 447 | Gift Ideas Corp. | 3 | 25 |**

**| 171 | Daedalus Designs Imports | 2 | 68 |**

**| 173 | Cambridge Collectables Co. | 2 | 68 |**

**| 177 | Osaka Souveniers Co. | 2 | 68 |**

**| 189 | Clover Collections, Co. | 2 | 68 |**

**| 202 | Canadian Gift Exchange Network | 2 | 68 |**

**| 204 | Online Mini Collectables | 2 | 68 |**

**| 211 | King Kong Collectables, Co. | 2 | 68 |**

**| 227 | Heintze Collectables | 2 | 68 |**

**| 319 | Mini Classics | 2 | 68 |**

**| 239 | Collectable Mini Designs Co. | 2 | 68 |**

**| 339 | Classic Gift Ideas, Inc | 2 | 68 |**

**| 344 | CAF Imports | 2 | 68 |**

**| 347 | Men 'R' US Retailers, Ltd. | 2 | 68 |**

**| 299 | Norway Gifts By Mail, Co. | 2 | 68 |**

**| 256 | Auto Associés & Cie. | 2 | 68 |**

**| 219 | Boards & Toys Co. | 2 | 68 |**

**| 260 | Royal Canadian Collectables, Ltd. | 2 | 68 |**

**| 259 | Toms Spezialitäten, Ltd | 2 | 68 |**

**| 456 | Microscale Inc. | 2 | 68 |**

**| 286 | Marta's Replicas Co. | 2 | 68 |**

**| 298 | Vida Sport, Ltd | 2 | 68 |**

**| 249 | Amica Models & Co. | 2 | 68 |**

**| 473 | Frau da Collezione | 2 | 68 |**

**| 475 | West Coast Collectables Co. | 2 | 68 |**

**| 484 | Iberia Gift Imports, Corp. | 2 | 68 |**

**| 240 | giftsbymail.co.uk | 2 | 68 |**

**| 487 | Signal Collectibles Ltd. | 2 | 68 |**

**| 489 | Double Decker Gift Stores, Ltd | 2 | 68 |**

**| 495 | Diecast Collectables | 2 | 68 |**

**| 455 | Super Scale Inc. | 2 | 68 |**

**| 415 | Bavarian Collectables Imports, Co. | 1 | 98 |**

**+----------------+------------------------------------+-------------+---------------+**

**98 rows in set (0.01 sec)**

**B 🡪**

**mysql> WITH Orders\_Per\_Month AS (**

**-> SELECT**

**-> YEAR(orderDate) AS Year,**

**-> MONTHNAME(orderDate) AS Month,**

**-> COUNT(orderNumber) AS TotalOrders**

**-> FROM Orders**

**-> GROUP BY Year, Month)**

**-> SELECT**

**-> o.Year,**

**-> o.Month,**

**-> o.TotalOrders,**

**-> COALESCE(p.TotalOrders, 0) AS PrevYearOrders,**

**-> CASE**

**-> WHEN p.TotalOrders = 0 THEN 'NULL'**

**-> ELSE CONCAT(FORMAT(((o.TotalOrders - p.TotalOrders) / p.TotalOrders) \* 100, 0), '%')**

**-> END AS YoYChange**

**-> FROM**

**-> Orders\_Per\_Month o**

**-> LEFT JOIN**

**-> Orders\_Per\_Month p**

**-> ON**

**-> o.Month = p.Month AND o.Year = p.Year + 1**

**-> ORDER BY**

**-> o.Year, FIELD(o.Month, 'January', 'February', 'March', 'April', 'May', 'June', 'July', 'August', 'September', 'October', 'November', 'December');**

**+------+-----------+-------------+----------------+-----------+**

**| Year | Month | TotalOrders | PrevYearOrders | YoYChange |**

**+------+-----------+-------------+----------------+-----------+**

**| 2003 | January | 5 | 0 | NULL |**

**| 2003 | February | 3 | 0 | NULL |**

**| 2003 | March | 6 | 0 | NULL |**

**| 2003 | April | 7 | 0 | NULL |**

**| 2003 | May | 6 | 0 | NULL |**

**| 2003 | June | 7 | 0 | NULL |**

**| 2003 | July | 7 | 0 | NULL |**

**| 2003 | August | 5 | 0 | NULL |**

**| 2003 | September | 8 | 0 | NULL |**

**| 2003 | October | 18 | 0 | NULL |**

**| 2003 | November | 30 | 0 | NULL |**

**| 2003 | December | 9 | 0 | NULL |**

**| 2004 | January | 8 | 5 | 60% |**

**| 2004 | February | 11 | 3 | 267% |**

**| 2004 | March | 8 | 6 | 33% |**

**| 2004 | April | 10 | 7 | 43% |**

**| 2004 | May | 8 | 6 | 33% |**

**| 2004 | June | 12 | 7 | 71% |**

**| 2004 | July | 11 | 7 | 57% |**

**| 2004 | August | 12 | 5 | 140% |**

**| 2004 | September | 12 | 8 | 50% |**

**| 2004 | October | 13 | 18 | -28% |**

**| 2004 | November | 33 | 30 | 10% |**

**| 2004 | December | 13 | 9 | 44% |**

**| 2005 | January | 12 | 8 | 50% |**

**| 2005 | February | 12 | 11 | 9% |**

**| 2005 | March | 13 | 8 | 63% |**

**| 2005 | April | 12 | 10 | 20% |**

**| 2005 | May | 15 | 8 | 88% |**

**+------+-----------+-------------+----------------+-----------+**

**29 rows in set (0.02 sec)**

**Q11. Subqueries and their applications**

**A 🡪**

**mysql> SELECT productLine, COUNT(\*) AS product\_count FROM Products WHERE buyPrice > (SELECT AVG(buyPrice) FROM Products) GROUP BY productLine;**

**+------------------+---------------+**

**| productLine | product\_count |**

**+------------------+---------------+**

**| Classic Cars | 24 |**

**| Motorcycles | 6 |**

**| Planes | 5 |**

**| Ships | 1 |**

**| Trains | 1 |**

**| Trucks and Buses | 7 |**

**| Vintage Cars | 10 |**

**+------------------+---------------+**

**7 rows in set (0.01 sec)**

**Q12. ERROR HANDLING in SQL**

**mysql> CREATE TABLE Emp\_EH (**

**-> EmpID INT PRIMARY KEY AUTO\_INCREMENT,**

**-> EmpName VARCHAR(255),**

**-> EmailAddress VARCHAR(255));**

**Query OK, 0 rows affected (0.03 sec)**

**CREATE DEFINER=`root`@`localhost`**

**PROCEDURE AddEmployee (IN p\_EmpName VARCHAR(255), IN p\_EmailAddress VARCHAR(255))**

**BEGIN**

**DECLARE EXIT HANDLER FOR SQLEXCEPTION**

**BEGIN**

**SELECT 'Error occurred';**

**END;**

**INSERT INTO Emp\_EH (EmpName, EmailAddress) VALUES (p\_EmpName, p\_EmailAddress**

**END**

**Q13. TRIGGERS**

**mysql> CREATE TABLE Emp\_BIT (**

**-> Name VARCHAR(255),**

**-> Occupation VARCHAR(255),**

**-> Working\_date DATE,**

**-> Working\_hours INT );**

**Query OK, 0 rows affected (0.03 sec)**

**mysql> INSERT INTO Emp\_BIT (Name, Occupation, Working\_date, Working\_hours) VALUES**

**-> ('Robin', 'Scientist', '2020-10-04', 12),**

**-> ('Warner', 'Engineer', '2020-10-04', 10),**

**-> ('Peter', 'Actor', '2020-10-04', 13),**

**-> ('Marco', 'Doctor', '2020-10-04', 14),**

**-> ('Brayden', 'Teacher', '2020-10-04', 12),**

**-> ('Antonio', 'Business', '2020-10-04', 11);**

**Query OK, 6 rows affected (0.01 sec)**

**Records: 6 Duplicates: 0 Warnings: 0**

**mysql> select \* from emp\_bit;**

**+---------+------------+--------------+---------------+**

**| Name | Occupation | Working\_date | Working\_hours |**

**+---------+------------+--------------+---------------+**

**| Robin | Scientist | 2020-10-04 | 12 |**

**| Warner | Engineer | 2020-10-04 | 10 |**

**| Peter | Actor | 2020-10-04 | 13 |**

**| Marco | Doctor | 2020-10-04 | 14 |**

**| Brayden | Teacher | 2020-10-04 | 12 |**

**| Antonio | Business | 2020-10-04 | 11 |**

**+---------+------------+--------------+---------------+**

**6 rows in set (0.00 sec)**

**CREATE DEFINER=`root`@`localhost`**

**TRIGGER ‘before\_insert\_emp\_bit’**

**BEFORE INSERT ON Emp\_BIT**

**FOR EACH ROW**

**BEGIN**

**IF NEW.Working\_hours < 0 THEN**

**SET NEW.Working\_hours = ABS(NEW.Working\_hours);**

**END IF;**

**END**