SQL Week: Project

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October 1, 2020

1 EXERCISE 1 - Northwind Queries

points awarded: 40 marks: 5 per problem

1.1 Problem

Write a query that lists all Customers in either Paris or London. Include Customer ID, Company Name and all address fields.

Solution

```
SELECT c.CustomerID, c.CompanyName AS "Company Name",
        CONCAT(c.Address, ', ', c.City, ', ', c.PostalCode, ', ', c.Country)
                                                                AS "Address"
FROM Customers c
WHERE c.City IN ('Paris', 'London')
```

CustomerID	Company Name	Address
AROUT	Around the Horn	120 Hanover Sq., London, WA1 1DP, UK
BSBEV	B's Beverages	Fauntleroy Circus, London, EC2 5NT, UK
CONSH	Consolidated Holdings	Berkeley Gardens 12 Brewery, London, WX1 6LT, UK
EASTC	Eastern Connection	35 King George, London, WX3 6FW, UK
NORTS	North/South	South House 300 Queensbridge, London, SW7 1RZ, UK
PARIS	Paris spécialités	265, boulevard Charonne, Paris, 75012, France
SEVES	Seven Seas Imports	90 Wadhurst Rd., London, OX15 4NB, UK
SPECD	Spécialités du monde	25, rue Lauriston, Paris, 75016, France

1.2 Problem

List all products stored in bottles.

Solution

```
SELECT p.ProductName, p.QuantityPerUnit
FROM Products p
WHERE p.QuantityPerUnit LIKE '%bottle%'
```

ProductName	QuantityPerUnit
Chang	24 - 12 oz bottles
Aniseed Syrup	12 - 550 ml bottles
Genen Shouyu	24 - 250 ml bottles
Sasquatch Ale	24 - 12 oz bottles
Steeleye Stout	24 - 12 oz bottles
Côte de Blaye	12 - 75 cl bottles
Chartreuse verte	750 cc per bottle
Sirop d'érable	24 - 500 ml bottles
Louisiana Fiery Hot Pepper Sauce	32 - 8 oz bottles
Laughing Lumberjack Lager	24 - 12 oz bottles
Outback Lager	24 - 355 ml bottles
Rhönbräu Klosterbier	24 - 0.5 l bottles

1.3 Problem

Repeat question above, but add in the Supplier Name and Country.

Solution

```
SELECT p.ProductName, P.QuantityPerUnit, s.CompanyName, s.Country
FROM Products p
INNER JOIN Suppliers s
ON p.SupplierID = s.SupplierID
WHERE p.QuantityPerUnit LIKE '%bottle%'
```

ProductName	QuantityPerUnit	CompanyName	Country
Chang	24 - 12 oz bottles	Exotic Liquids	UK
Aniseed Syrup	12 - 550 ml bottles	Exotic Liquids	UK
Genen Shouyu	24 - 250 ml bottles	Mayumi's	Japan
Sasquatch Ale	24 - 12 oz bottles	Bigfoot Breweries	USA
Steeleye Stout	24 - 12 oz bottles	Bigfoot Breweries	USA
Côte de Blaye	12 - 75 cl bottles	Aux joyeux ecclésiastiques	France
Chartreuse verte	750 cc per bottle	Aux joyeux ecclésiastiques	France
Sirop d'érable	24 - 500 ml bottles	Forêts d'érables	Canada
Louisiana Fiery Hot Pepper Sauce	32 - 8 oz bottles	New Orleans Cajun Delights	USA
Laughing Lumberjack Lager	24 - 12 oz bottles	Bigfoot Breweries	USA
Outback Lager	24 - 355 ml bottles	Pavlova, Ltd.	Australia
Rhönbräu Klosterbier	24 - 0.5 l bottles	Plutzer Lebensmittelgroßmärkte AG	Germany

1.4 Problem

Write an SQL Statement that shows how many products there are in each category. Include Category Name in result set and list the highest number first.

Solution

```
SELECT c.CategoryName, COUNT(p.ProductID) AS "Products per Category"
FROM Products p
INNER JOIN Categories c
    ON p.CategoryID = c.CategoryID
GROUP BY c.CategoryName
ORDER BY COUNT(p.ProductID) DESC
```

CategoryName	Products per Category
Confections	13
Beverages	12
Condiments	12
Seafood	12
Dairy Products	10
Grains/Cereals	7
Meat/Poultry	6
Produce	5

1.5 Problem

List all UK employees using concatenation to join their title of courtesy, first name and last name together. Also include their city of residence.

Solution

```
SELECT CONCAT(e.TitleOfCourtesy, ' ', e.FirstName, ' ', e.LastName)
                                                        AS "Full Name",
        e.City
FROM Employees e
WHERE e.Country = 'UK'
```

Full Name	City
Mr. Steven Buchanan	London
Mr. Michael Suyama	London
Mr. Robert King	London
Ms. Anne Dodsworth	London

1.6 Problem

List Sales Totals for all Sales Regions (via the Territories table using 4 joins) with a Sales Total greater than 1,000,000. Use rounding or FORMAT to present the numbers.

Solution

```
SELECT FORMAT(SUM(od.UnitPrice * od.Quantity * (1 - od.Discount)), 'C')
                                                AS "Sales Total By Region",
        r.RegionDescription AS "Region"
FROM [Order Details] od
INNER JOIN Orders o
    ON o.orderID = od.orderID
INNER JOIN EmployeeTerritories et
    ON et.EmployeeID = o.EmployeeID
INNER JOIN Territories t
    ON t.TerritoryID = et.TerritoryID
INNER JOIN Region r
    ON t.RegionID = r.RegionID
GROUP BY r.RegionID, r.RegionDescription
HAVING SUM(od.UnitPrice * od.Quantity * (1 - od.Discount)) > 1000000
ORDER BY "Sales Total By Region"
```

Sales Total By Region	Region
$1,048,605.58	Northern
$1,615,248.00	Western
$2,730,198.01	Eastern

1.7 Problem

Count how many Orders have a Freight amount greater than 100.00 and either USA or UK as Ship Country.

Solution

```
SELECT COUNT(*)
        AS "Orders from USA and UK with a Freight amount greater than 100.00"
FROM Orders o
WHERE o.Freight > 100.00 AND (O.ShipCountry IN ('USA', 'UK'))
```

Orders from USA and UK with a Freight amount greater than 100.00
49

1.8 Problem

Write an SQL Statement to identify the Order Number of the Order with the highest amount(value) of discount applied to that order.MAX

Solution

```
SELECT od.OrderID,
        FORMAT(SUM(od.Discount * od.Quantity * od.UnitPrice), 'C')
                                                    AS "Total Discount"
FROM [Order Details] od
WHERE od.Discount > 0
GROUP BY od.OrderID
HAVING SUM(od.Discount * od.Quantity * od.UnitPrice) =
        (SELECT TOP 1 (SUM(UnitPrice * Quantity * Discount))
        FROM [Order Details]
        WHERE Discount > 0
        GROUP BY OrderID
        ORDER BY SUM(UnitPrice * Quantity * Discount) DESC)
```

OrderID	Total Discount
11030	$3,706.85

2 EXERCISE 2 - Create Spartans Table

points awarded: 20 marks: 10 per problem

2.1 Problem

Write the correct SQL statement to create the following table:

- Spartans Table – include details about all the Spartans on this course: separate Title, First Name and Last Name into separate columns, and include University attended, course taken and mark achieved
- Add any other columns you feel would be appropriate

Solution

```
DROP TABLE IF EXISTS spartans_table

CREATE TABLE spartans_table(
    id INT NOT NULL IDENTITY PRIMARY KEY,
    title VARCHAR(5),
    first_name VARCHAR(20),
    last_name VARCHAR(20),
    univeristy_attended VARCHAR(50),
    course VARCHAR(50),
    mark VARCHAR(10)
)
```

By running the following command

```
SP_HELP spartans_table
```

we confirm the table has been successfully created

Name	Owner	Type	Created_datetime
spartans_table	dbo	user table	2020-09-30 15:56:18.523

2.2 Problem

Write SQL statements to add the details of the Spartans in your course to the table you have created

Solution

```
INSERT INTO spartans_table VALUES
('Mr.', 'Emmanuel', 'Buraimo', 'King''s College London',
                    'Computer Science', '2:1'),
('Mr.', 'Svilen', 'Petrov', 'London Metropolitan University',
                    'BSc Computing', 'First'),
('Mr.', 'Reece', 'Louche', 'Univeristy of Warwick',
                    'Computer Science', '2:2'),
('Mr.','Shahid','Enayat','Brunel University',
                    'Electronic and Electrical Engineering','2:2'),
('Mr.', 'Abdullah', 'Muhammad', 'University of Southampton',
                    'Physics', 'First'),
('Mr.', 'Ben', 'Swift', 'Nottingham Trent University',
                    'Computer Science', '2:1'),
('Mr.', 'Saleh', 'Sandhu', 'University of Westminster',
                    'Computer Science', '2:1'),
('Mr.', 'Toyin', 'Ajani', 'University of Bath',
                    'Chemical Engineering', 'First'),
('Mr.', 'Chris', 'Cunningham', 'Loughborough University',
                    'Computer Science', '2:1'),
('Mr.', 'Dami', 'Oshidele', 'King''s College London',
                    'Electronic Engineering with Management', '2:1'),
('Miss', 'Janja', 'Kovacevic', 'University of Massachusetts Amherst',
                    'Computer Science and Computational Mathematics', '3.9')
```

By running the following query

```
SELECT * FROM spartans_table
```

we confirm the data has been successfully inserted

id	title	first_name	last_name	univeristy_attended	course	mark
1	Mr.	Emmanuel	Buraimo	King's College London	Computer Science	2:1
2	Mr.	Svilen	Petrov	London Metropolitan University	BSc Computing	First
3	Mr.	Reece	Louche	Univeristy of Warwick	Computer Science	2:2
4	Mr.	Shahid	Enayat	Brunel University	Electronic and Electrical Engineering	2:2
5	Mr.	Abdullah	Muhammad	University of Southampton	Physics	First
6	Mr.	Ben	Swift	Nottingham Trent University	Computer Science	2:1
7	Mr.	Saleh	Sandhu	University of Westminster	Computer Science	2:1
8	Mr.	Toyin	Ajani	University of Bath	Chemical Engineering	First
9	Mr.	Chris	Cunningham	Loughborough University	Computer Science	2:1
10	Mr.	Dami	Oshidele	King's College London	Electronic Engineering with Management	2:1
11	Miss	Janja	Kovacevic	University of Massachusetts Amherst	Computer Science and Computational Mathematics	3.9

3 EXERCISE 3 - Northwind Data Analysis linked to Excel

points awarded: 30 marks: as specified per problem

Write SQL statements to extract the data required for the following charts (create these in Excel):

3.1 Problem

List all Employees from the Employees table and who they report to. No Excel required. (5 marks)

Solution

```
SELECT CONCAT(e1.FirstName, ' ', e1.LastName) AS "Employee Name",
       CONCAT(e2.FirstName, ' ', e2.LastName) AS "Manager the Employee Reports To"
FROM Employees e1
LEFT JOIN Employees e2
ON e1.ReportsTo = e2.EmployeeID
```

Employee Name	Manager the Employee Reports To
Nancy Davolio	Andrew Fuller
Andrew Fuller	
Janet Leverling	Andrew Fuller
Margaret Peacock	Andrew Fuller
Steven Buchanan	Andrew Fuller
Michael Suyama	Steven Buchanan
Robert King	Steven Buchanan
Laura Callahan	Andrew Fuller
Anne Dodsworth	Steven Buchanan

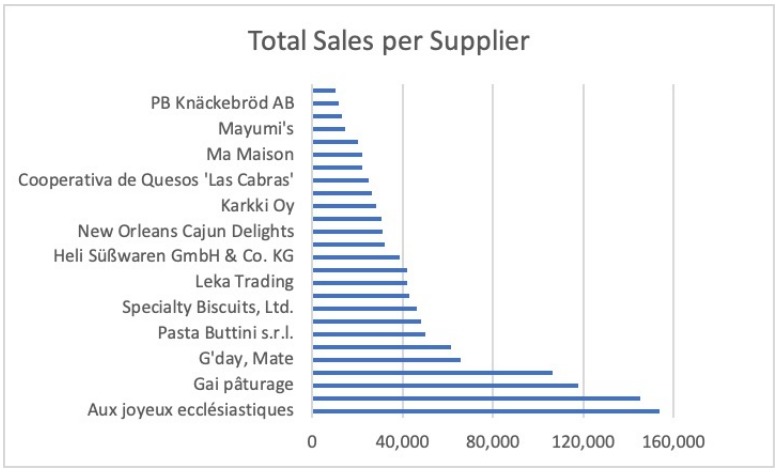
3.2 Problem

List all Suppliers with total sales over $10,000 in the Order Details table. Include the Company Name from the Suppliers Table and present as a bar chart as below: (5 Marks)

Solution

```
SELECT s.CompanyName,
       FORMAT(SUM(od.UnitPrice * od.Quantity * (1 - od.Discount)), '#,#')
                                              AS "Total Sales per Supplier"
FROM Suppliers s
    JOIN Products p
        ON p.SupplierID = s.SupplierID
    JOIN [Order Details] od
        ON od.ProductID = p.ProductID
GROUP BY s.SupplierID, s.CompanyName
HAVING SUM(od.UnitPrice * od.Quantity * (1 - od.Discount)) > 10000
ORDER BY SUM(od.UnitPrice * od.Quantity * (1 - od.Discount)) DESC
```

CompanyName	Total Sales per Supplier
Aux joyeux ecclésiastiques	153,691
Plutzer Lebensmittelgroßmärkte AG	145,372
Gai pâturage	117,981
Pavlova, Ltd.	106,460
G'day, Mate	65,627
Forêts d'érables	61,588
Pasta Buttini s.r.l.	50,255
Formaggi Fortini s.r.l.	48,225
Specialty Biscuits, Ltd.	46,244
Norske Meierier	43,142
Leka Trading	42,018
Grandma Kelly's Homestead	41,953
Heli Süßwaren GmbH & Co. KG	38,653
Exotic Liquids	32,188
New Orleans Cajun Delights	31,168
Tokyo Traders	30,526
Karkki Oy	28,443
New England Seafood Cannery	26,591
Cooperativa de Quesos 'Las Cabras'	25,159
Bigfoot Breweries	22,391
Ma Maison	22,155
Svensk Sjöföda AB	20,144
Mayumi's	14,737
Nord-Ost-Fisch Handelsgesellschaft mbH	13,424
PB Knäckebröd AB	11,724
Lyngbysild	10,221


Total Sales per Supplier
PB Knäckebröd AB
Mayumi's
Ma Maison
Cooperativa de Quesos 'Las Cabras'
Karkki Oy
New Orleans Cajun Delights
Heli Süßwaren GmbH & Co. KG
Leka Trading
Specialty Biscuits, Ltd.
Pasta Buttini s.r.l.
G'day, Mate
Gai pâturage
Aux joyeux ecclésiastiques
0
40,000
80,000
120,000
160,000

3.3 Problem

List the Top 10 Customers YTD for the latest year in the Orders file. Based on total value of orders shipped. No Excel required. (10 Marks)

Solution

```
SELECT TOP 10 c.CustomerID, c.CompanyName,
    FORMAT(SUM(od.UnitPrice * od.Quantity * (1-od.Discount)), 'C')
                            AS "Total Value Of Orders Shipped in YTD"
FROM [Order Details] od
INNER JOIN Orders o
    ON od.OrderID = o.OrderID
INNER JOIN Customers c
    ON o.CustomerID = c.CustomerID
WHERE YEAR(o.OrderDate) IN (SELECT YEAR(MAX(OrderDate)) FROM Orders)
                                        AND o.ShippedDate IS NOT NULL
GROUP BY c.CustomerID, c.CompanyName
ORDER BY SUM(od.UnitPrice * od.Quantity * (1-od.Discount)) DESC
```

CustomerID	CompanyName	Total Value Of Orders Shipped in YTD
QUICK	QUICK-Stop	$37,217.32
SAVEA	Save-a-lot Markets	$36,310.11
ERNSH	Ernst Handel	$31,311.75
HANAR	Hanari Carnes	$23,821.20
HUNGO	Hungry Owl All-Night Grocers	$20,402.12
RATTC	Rattlesnake Canyon Grocery	$19,982.55
KOENE	Königlich Essen	$19,582.77
WHITC	White Clover Markets	$15,278.90
FOLKO	Folk och fä HB	$13,644.07
SUPRD	Suprêmes délices	$11,644.60

3.4 Problem

Plot the Average Ship Time by month for all data in the Orders Table using a line chart as below. (10 Marks)

Solution

```
SELECT CONCAT(MONTH(o.OrderDate), '-',YEAR(o.OrderDate))
                                AS "Month-Year Ordered",
    AVG(CAST(DATEDIFF(d, o.OrderDate, o.ShippedDate) As DECIMAL(4,2)))
                                AS "Average Ship Time in Days by Month"
FROM Orders o
WHERE o.ShippedDate IS NOT NULL
GROUP BY YEAR(o.OrderDate), MONTH(o.OrderDate)
ORDER BY YEAR(o.OrderDate), MONTH(o.OrderDate)
```

Month-Year Ordered	Average Ship Time in Days by Month
7-1996	8.045454
8-1996	8.000000
9-1996	10.608695
10-1996	6.500000
11-1996	8.360000
12-1996	7.516129
1-1997	9.969696
2-1997	9.310344
3-1997	8.300000
4-1997	9.000000
5-1997	9.156250
6-1997	8.833333
7-1997	8.696969
8-1997	6.787878
9-1997	9.135135
10-1997	8.710526
11-1997	8.735294
12-1997	9.854166
1-1998	9.054545
2-1998	7.222222
3-1998	9.397260
4-1998	6.650793
5-1998	2.500000