SQL Practical Exercise

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Introduction

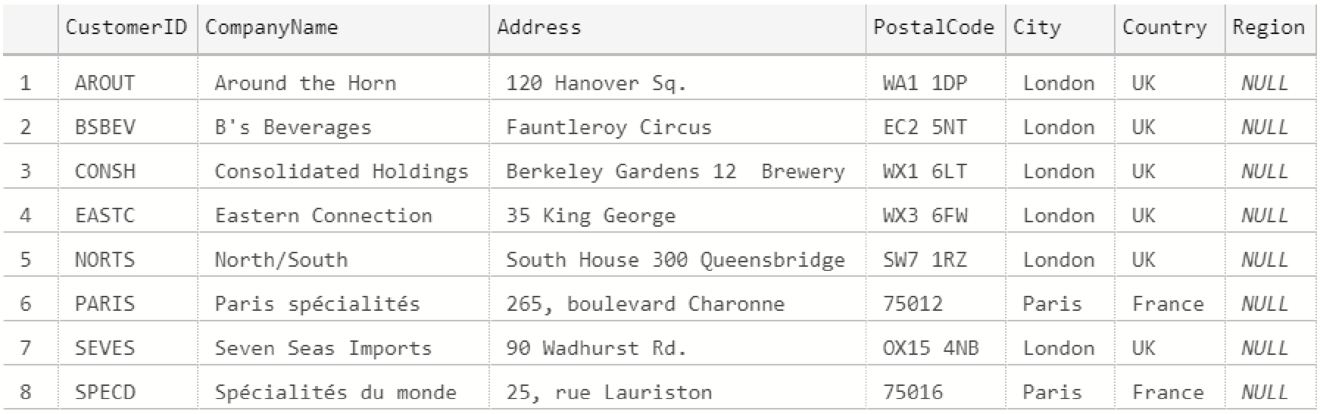
This exercise requires you to know the following aspects of SQL:

CREATE TABLE	Concatenation
SQL Data Types	Formatting dates and numbers
INSERT INTO	Column aliases
SELECT	Simple JOIN statements
WHERE clause	Complex JOIN statements
LIKE and wildcards	Subquery

Exercise 1 – Northwind Queries (40 marks: 5 for each question)

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

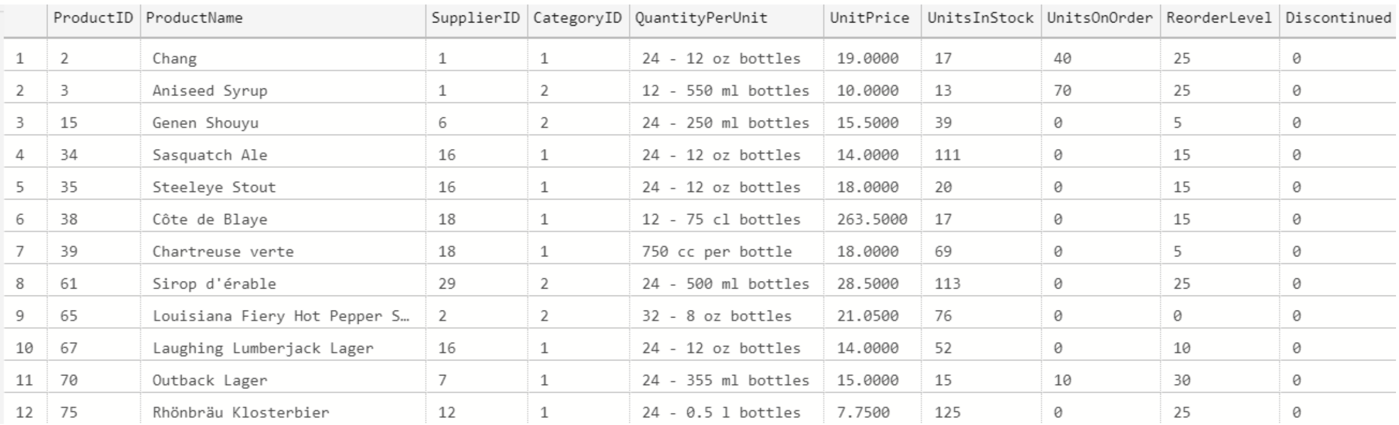
```
SELECT c.CustomerID, c.CompanyName, c.Address, c.PostalCode, c.City, c.Country, c.Region
FROM Customers c WHERE CITY IN('Paris', 'London')
```



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

1.2 List all products stored in bottles.

```
SELECT * FROM Products
WHERE QuantityPerUnit LIKE '%bottle%'
```

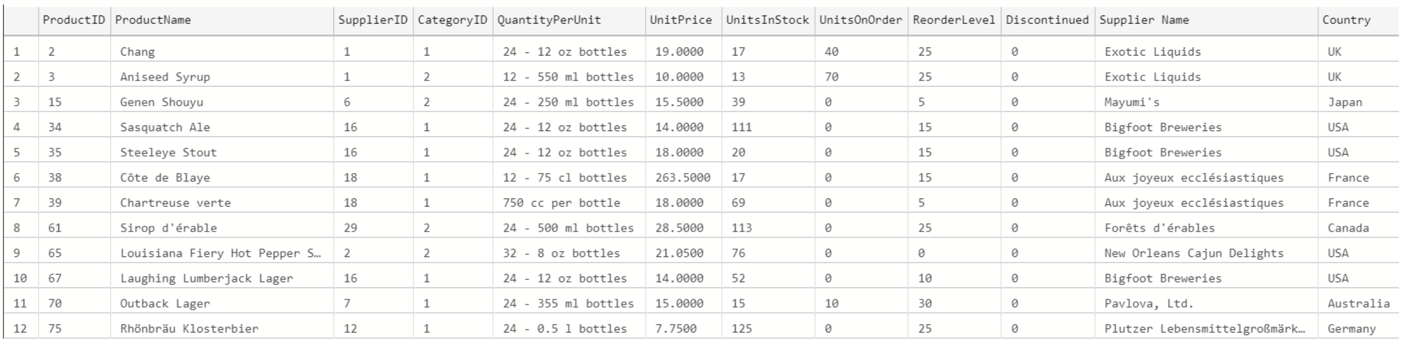


	ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued
1	2	Chang	1	1	24 - 12 oz bottles	19.0000	17	40	25	0
2	3	Aniseed Syrup	1	2	12 - 550 ml bottles	10.0000	13	70	25	0
3	15	Genen Shouyu	6	2	24 - 250 ml bottles	15.5000	39	0	5	0
4	34	Sasquatch Ale	16	1	24 - 12 oz bottles	14.0000	111	0	15	0
5	35	Steeleye Stout	16	1	24 - 12 oz bottles	18.0000	20	0	15	0
6	38	Côte de Blaye	18	1	12 - 75 cl bottles	263.5000	17	0	15	0
7	39	Chartreuse verte	18	1	750 cc per bottle	18.0000	69	0	5	0
8	61	Sirop d'érable	29	2	24 - 500 ml bottles	28.5000	113	0	25	0
9	65	Louisiana Fiery Hot Pepper S…	2	2	32 - 8 oz bottles	21.0500	76	0	0	0
10	67	Laughing Lumberjack Lager	16	1	24 - 12 oz bottles	14.0000	52	0	10	0
11	70	Outback Lager	7	1	24 - 355 ml bottles	15.0000	15	10	30	0
12	75	Rhönbräu Klosterbier	12	1	24 - 0.5 l bottles	7.7500	125	0	25	0

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

```
   SELECT p.ProductID, p.ProductName, p.SupplierID, p.CategoryID,
   p.QuantityPerUnit, p.UnitPrice, p.UnitsInStock, p.UnitsOnOrder,
   p.ReorderLevel, p.Discontinued, s.CompanyName AS "Supplier Name", s.Country FROM Products p INNER JOIN
 Suppliers s
```

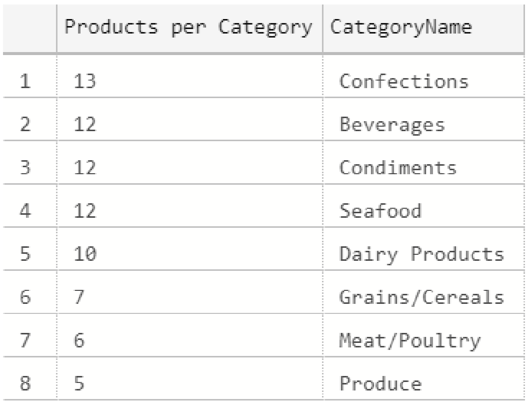
```
ON p.SupplierID = s.SupplierID
WHERE QuantityPerUnit LIKE '%bottle%'
```



	ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued	Supplier Name	Country
1	2	Chang	1	1	24 - 12 oz bottles	19.0000	17	40	25	0	Exotic Liquids	UK
2	3	Aniseed Syrup	1	2	12 - 550 ml bottles	10.0000	13	70	25	0	Exotic Liquids	UK
3	15	Genen Shouyu	6	2	24 - 250 ml bottles	15.5000	39	0	5	0	Mayumi's	Japan
4	34	Sasquatch Ale	16	1	24 - 12 oz bottles	14.0000	111	0	15	0	Bigfoot Breweries	USA
5	35	Steeleye Stout	16	1	24 - 12 oz bottles	18.0000	20	0	15	0	Bigfoot Breweries	USA
6	38	Côte de Blaye	18	1	12 - 75 cl bottles	263.5000	17	0	15	0	Aux joyeux ecclésiastiques	France
7	39	Chartreuse verte	18	1	750 cc per bottle	18.0000	69	0	5	0	Aux joyeux ecclésiastiques	France
8	61	Sirop d'érable	29	2	24 - 500 ml bottles	28.5000	113	0	25	0	Forêts d'érables	Canada
9	65	Louisiana Fiery Hot Pepper S…	2	2	32 - 8 oz bottles	21.0500	76	0	0	0	New Orleans Cajun Delights	USA
10	67	Laughing Lumberjack Lager	16	1	24 - 12 oz bottles	14.0000	52	0	10	0	Bigfoot Breweries	USA
11	70	Outback Lager	7	1	24 - 355 ml bottles	15.0000	15	10	30	0	Pavlova, Ltd.	Australia
12	75	Rhönbräu Klosterbier	12	1	24 - 0.5 l bottles	7.7500	125	0	25	0	Plutzer Lebensmittelgroßmärk…	Germany

1.4 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.

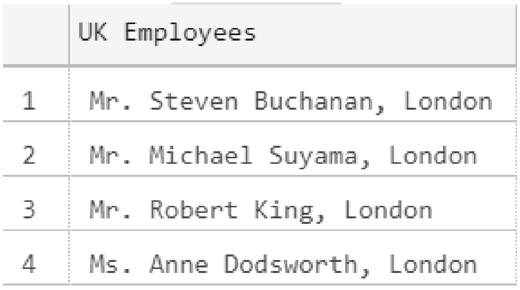
```
SELECT COUNT(p.CategoryID) AS "Products per Category", c.CategoryName FROM Categories c INNER JOIN Pro
ducts p
ON c.CategoryID = p.CategoryID
GROUP BY p.CategoryID, c.CategoryName
ORDER BY COUNT(p.CategoryID) DESC
```



	Products per Category	CategoryName
1	13	Confections
2	12	Beverages
3	12	Condiments
4	12	Seafood
5	10	Dairy Products
6	7	Grains/Cereals
7	6	Meat/Poultry
8	5	Produce

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

```
SELECT e.TitleOfCourtesy + ' ' + e.FirstName + ' ' + e.LastName + ', ' + e.City AS "UK Employees"
FROM Employees e
WHERE Country = 'UK'
```



	UK Employees
1	Mr. Steven Buchanan, London
2	Mr. Michael Suyama, London
3	Mr. Robert King, London
4	Ms. Anne Dodsworth, London

1.6 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.

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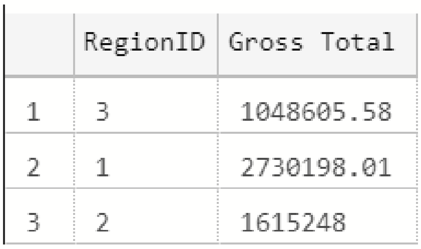
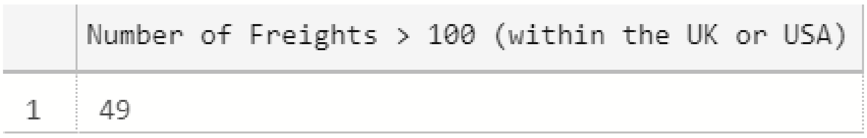
```
SELECT r.RegionID, ROUND(SUM((od.UnitPrice * od.Quantity) * (1 -
 od.Discount)), 2) AS "Gross Total" FROM Region r
INNER JOIN Territories t ON r.RegionID = t.RegionID
INNER JOIN EmployeeTerritories et ON t.TerritoryID = et.TerritoryID
INNER JOIN Employees e ON et.EmployeeID = e.EmployeeID
INNER JOIN Orders o ON e.EmployeeID = o.EmployeeID
INNER JOIN [Order Details] od ON o.OrderID = od.OrderID
GROUP BY r.RegionID
HAVING ROUND(SUM((od.UnitPrice * od.Quantity) * (1 - od.Discount)), 2) > 1000000
```



	RegionID	Gross Total
1	3	1048605.58
2	1	2730198.01
3	2	1615248

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

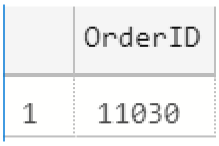
```
SELECT COUNT(*) AS "Number of Freights > 100 (within the UK or USA)"
FROM Orders
WHERE Freight > 100 AND (ShipCountry = 'UK' or ShipCountry = 'USA')
```



	Number of Freights > 100 (within the UK or USA)
1	49

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

```
SELECT TOP 1 OrderID FROM [Order Details]
GROUP BY OrderID
ORDER BY SUM(UnitPrice*Quantity*Discount) DESC
```



	OrderID
1	11030

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Exercise 2 – Create Spartans Table (20 marks – 10 each)

2.1 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.

```
CREATE TABLE Spartans(
    SpartanID INT IDENTITY PRIMARY KEY,
    Title CHAR(6),
    FirstName VARCHAR(20),
    LastName VARCHAR(20),
    University VARCHAR(20),
    CourseTaken VARCHAR(20),
    MarkAchieved INT
)
```

IMPORTANT NOTE: For data protection reasons do NOT include date of birth in this exercise.

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

```
INSERT INTO Spartans VALUES
('Mr.','Khari','McGhie','Goldsmiths','Computer Science', 78),
('Mr.', 'Nirel', 'Warde', 'Greenwich', 'Computer Science', 85),
('Mr.', 'Mac', 'Ushe', 'Wandsworth', 'Engineering', 80),
('Ms.', 'Muna', 'Mahmoud Dirie', 'Ravensbourne', 'Computer Science', 78),
('Mr.', 'Ross', 'Savill', 'Greenwich', 'Business', 90)
```

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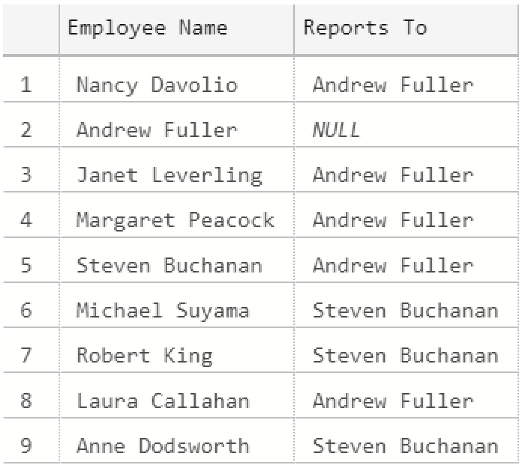
Exercise 3 – Northwind Data Analysis linked to Excel (30 marks)

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

3.1 List all Employees from the Employees table and who they report to. No Excel required. Please mention the Employee Names and the ReportTo names. (5 Marks)

```sql
SELECT e.FirstName + ' ' + e.LastName AS "Employee Name", e2.FirstName + ' ' + e2.LastName AS "Reports To
" FROM Employees e
LEFT JOIN Employees e2 ON e.ReportsTo = e2.EmployeeID
```



	Employee Name	Reports To
1	Nancy Davolio	Andrew Fuller
2	Andrew Fuller	*NULL*
3	Janet Leverling	Andrew Fuller
4	Margaret Peacock	Andrew Fuller
5	Steven Buchanan	Andrew Fuller
6	Michael Suyama	Steven Buchanan
7	Robert King	Steven Buchanan
8	Laura Callahan	Andrew Fuller
9	Anne Dodsworth	Steven Buchanan

3.2 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)

```sql
SELECT s.CompanyName, SUM((od.UnitPrice * od.Quantity) * (1 -
 od.Discount)) AS "Total Sales Over $10,000" FROM [Order Details] od
INNER JOIN Products p ON od.ProductID = p.ProductID
INNER JOIN Suppliers s ON p.SupplierID = s.SupplierID
GROUP BY s.CompanyName
HAVING SUM((od.UnitPrice * od.Quantity) * (1 - od.Discount)) > 10000
ORDER BY "Total Sales Over $10,000" DESC
```

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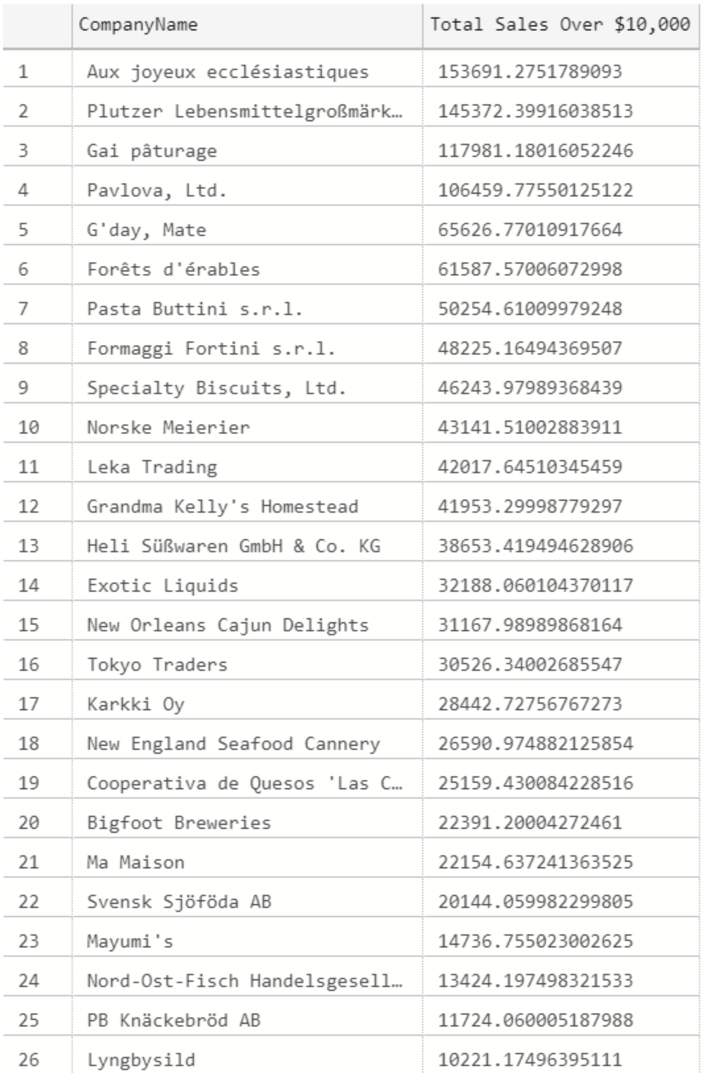
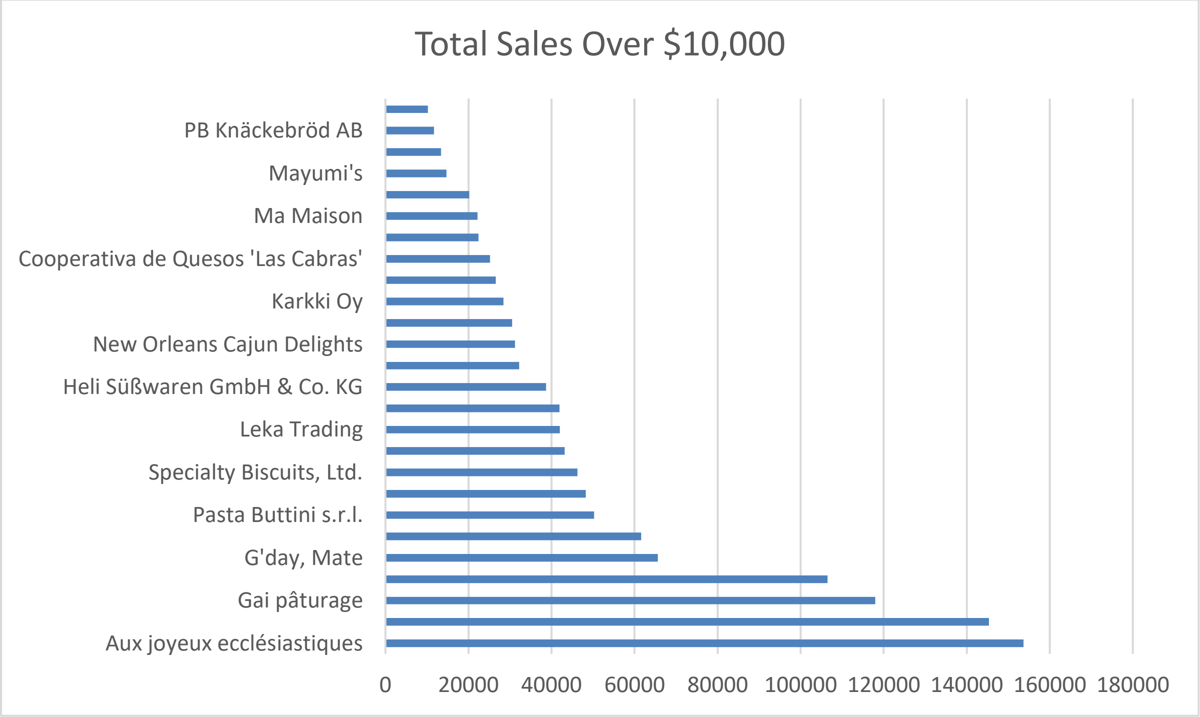


	CompanyName	Total Sales Over $10,000
1	Aux joyeux ecclésiastiques	153691.2751789093
2	Plutzer Lebensmittelgroßmärk…	145372.39916038513
3	Gai pâturage	117981.18016052246
4	Pavlova, Ltd.	106459.77550125122
5	G'day, Mate	65626.77010917664
6	Forêts d'érables	61587.57006072998
7	Pasta Buttini s.r.l.	50254.61009979248
8	Formaggi Fortini s.r.l.	48225.16494369507
9	Specialty Biscuits, Ltd.	46243.97989368439
10	Norske Meierier	43141.51002883911
11	Leka Trading	42017.64510345459
12	Grandma Kelly's Homestead	41953.29998779297
13	Heli Süßwaren GmbH & Co. KG	38653.419494628906
14	Exotic Liquids	32188.060104370117
15	New Orleans Cajun Delights	31167.98989868164
16	Tokyo Traders	30526.34002685547
17	Karkki Oy	28442.72756767273
18	New England Seafood Cannery	26590.974882125854
19	Cooperativa de Quesos 'Las C…	25159.430084228516
20	Bigfoot Breweries	22391.20004272461
21	Ma Maison	22154.637241363525
22	Svensk Sjöföda AB	20144.059982299805
23	Mayumi's	14736.755023002625
24	Nord-Ost-Fisch Handelsgesell…	13424.197498321533
25	PB Knäckebröd AB	11724.060005187988
26	Lyngbysild	10221.17496395111



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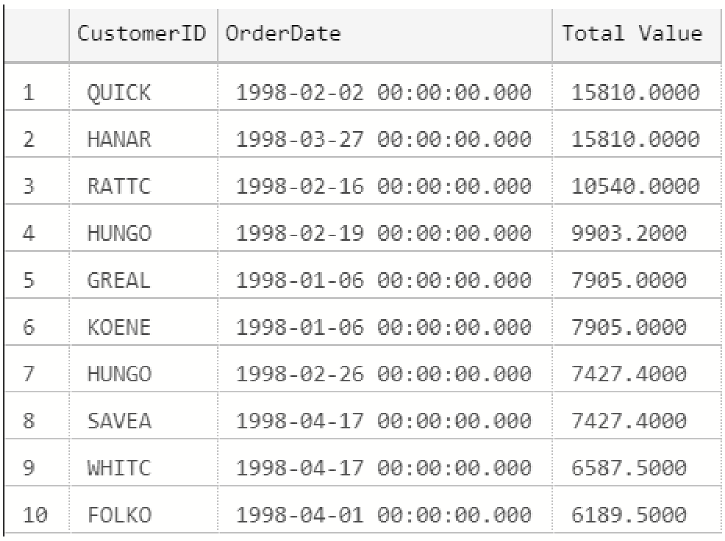
3.3 List the Top 10 Customers YTD for the latest year in the Orders file. Based on total value of orders shipped. No Excel required. (10 Marks)

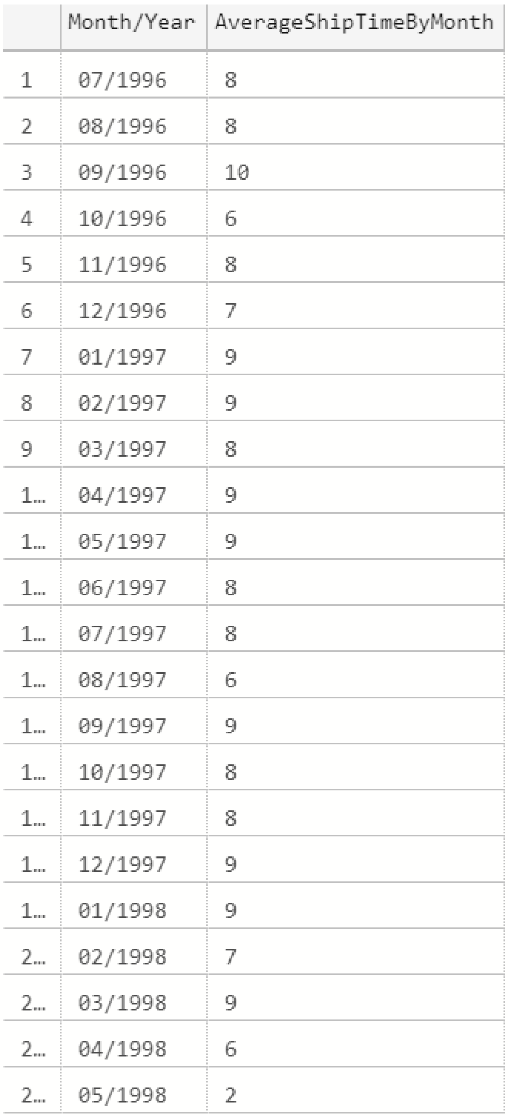
```
SELECT TOP 10 o.CustomerID, o.OrderDate, (od.UnitPrice * od.Quantity) AS "Total Value" FROM Orders o
INNER JOIN [Order Details] od ON o.OrderID = od.OrderID
WHERE YEAR(o.OrderDate) = 1998
ORDER BY "Total Value" DESC
```



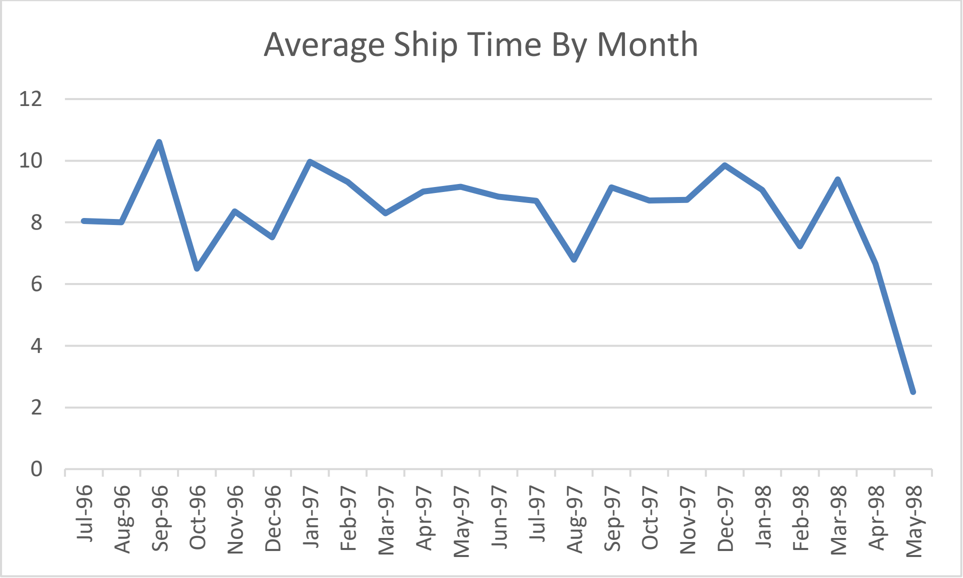
	CustomerID	OrderDate	Total Value
1	QUICK	1998-02-02 00:00:00.000	15810.0000
2	HANAR	1998-03-27 00:00:00.000	15810.0000
3	RATTC	1998-02-16 00:00:00.000	10540.0000
4	HUNGO	1998-02-19 00:00:00.000	9903.2000
5	GREAL	1998-01-06 00:00:00.000	7905.0000
6	KOENE	1998-01-06 00:00:00.000	7905.0000
7	HUNGO	1998-02-26 00:00:00.000	7427.4000
8	SAVEA	1998-04-17 00:00:00.000	7427.4000
9	WHITC	1998-04-17 00:00:00.000	6587.5000
10	FOLKO	1998-04-01 00:00:00.000	6189.5000

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

```
SELECT FORMAT("Date", 'MM/yyyy') AS "Month/Year", AVG("Ship Time") AS "Average Ship Time (in Months)"
FROM (SELECT o.OrderDate AS "Date", MONTH(o.OrderDate) AS "Month", YEAR(o.OrderDate) AS "Year",
        DATEDIFF(DAY, o.OrderDate, o.ShippedDate) AS "Ship Time" FROM Orders o) AS "Ship Times"
GROUP BY FORMAT("Date",'MM/yyyy'), "Month", "Year"
ORDER BY "Year", "Month"
```



	Month/Year	AverageShipTimeByMonth
1	07/1996	8
2	08/1996	8
3	09/1996	10
4	10/1996	6
5	11/1996	8
6	12/1996	7
7	01/1997	9
8	02/1997	9
9	03/1997	8
1...	04/1997	9
1...	05/1997	9
1...	06/1997	8
1...	07/1997	8
1...	08/1997	6
1...	09/1997	9
1...	10/1997	8
1...	11/1997	8
1...	12/1997	9
1...	01/1998	9
2...	02/1998	7
2...	03/1998	9
2...	04/1998	6
2...	05/1998	2



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Standards (10 marks)

Remember to apply all the following standards:

- Use consistent capitalisation and indentation of SQL Statements
- Use concise and consistent table alias names
- Use column aliases to ensure tidy column headings (spaces and consistent capitalisation)
- Concatenate any closely related columns e.g. First Name and Last Name or Address and City etc
- Put comments throughout