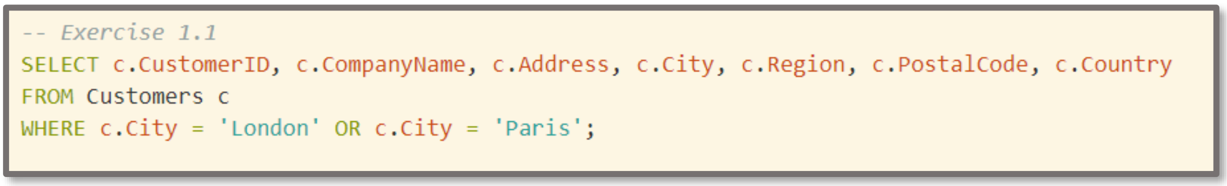
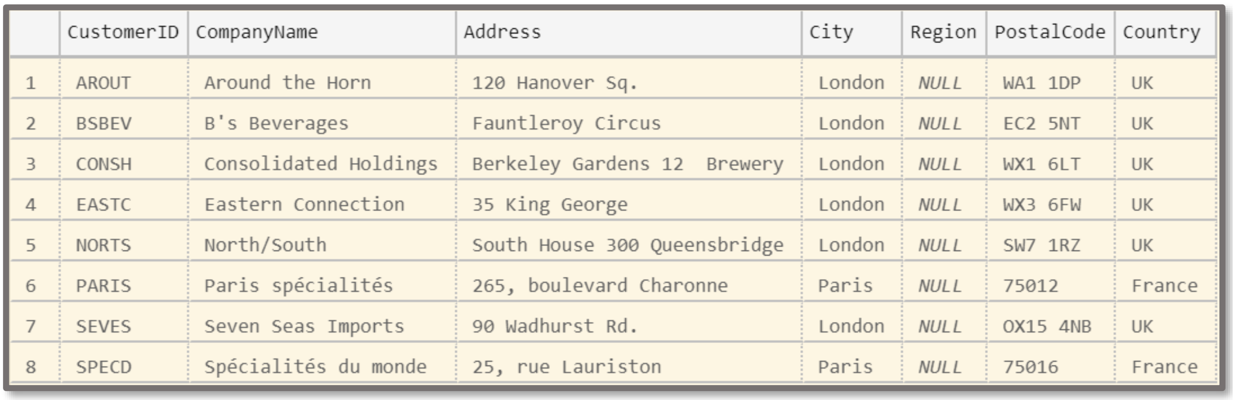
Exercise 1 – Northwind Queries (40 marks: 5 for each question)

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

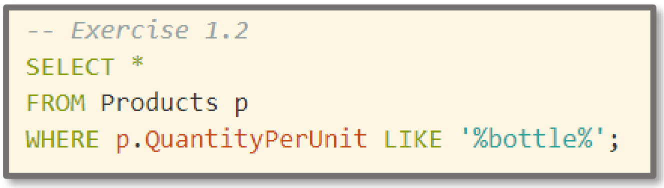


```
-- Exercise 1.1
SELECT c.CustomerID, c.CompanyName, c.Address, c.City, c.Region, c.PostalCode, c.Country
FROM Customers c
WHERE c.City = 'London' OR c.City = 'Paris';
```

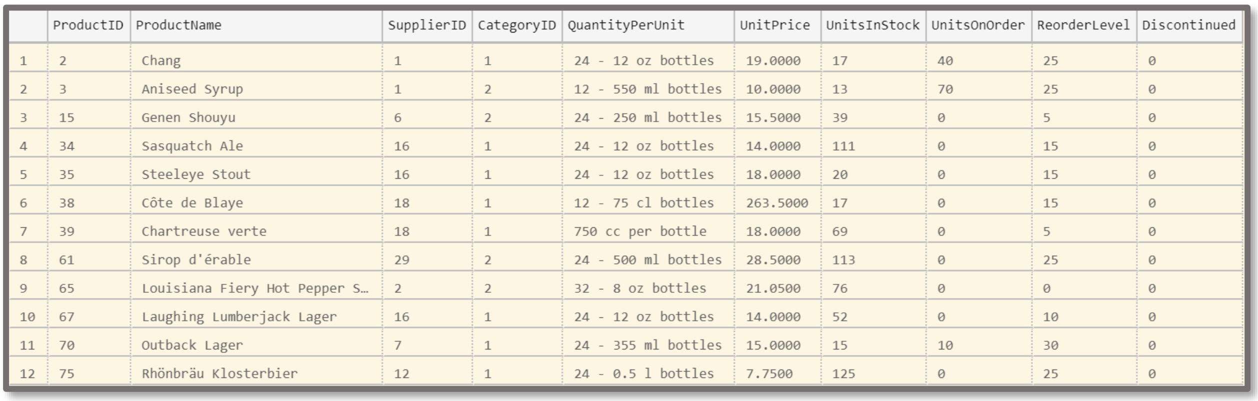


	CustomerID	CompanyName	Address	City	Region	PostalCode	Country
1	AROUT	Around the Horn	120 Hanover Sq.	London	NULL	WA1 1DP	UK
2	BSBEV	B's Beverages	Fauntleroy Circus	London	NULL	EC2 5NT	UK
3	CONSH	Consolidated Holdings	Berkeley Gardens 12 Brewery	London	NULL	WX1 6LT	UK
4	EASTC	Eastern Connection	35 King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

1.2 List all products stored in bottles.

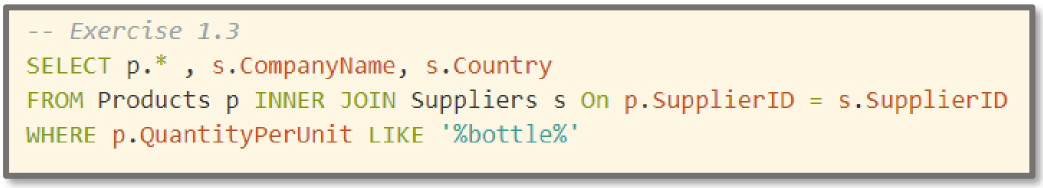


```
-- Exercise 1.2
SELECT *
FROM Products p
WHERE p.QuantityPerUnit LIKE '%bottle%';
```

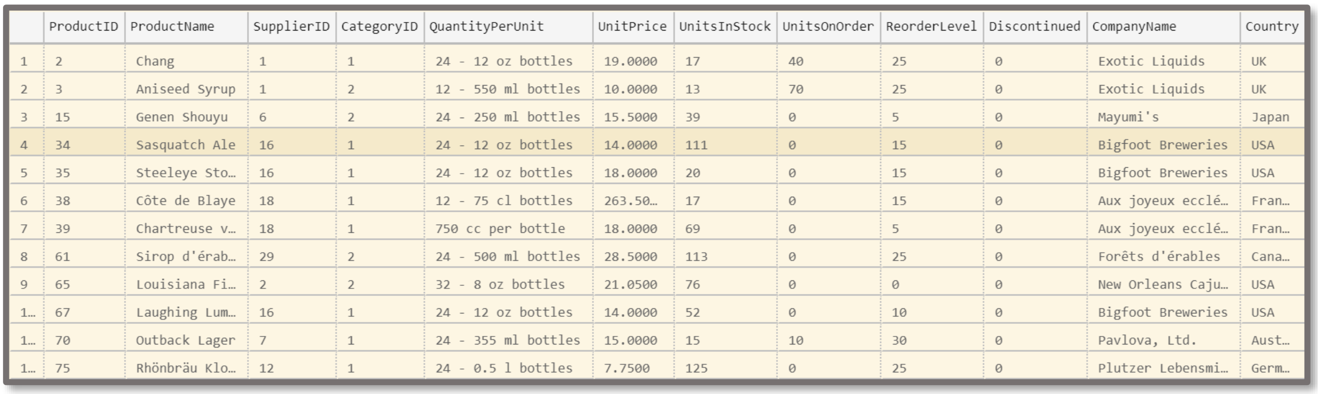


	ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued
1	2	Chang	1	1	24 - 12 oz bottles	19.0000	17	40	25	0
2	3	Aniseed Syrup	1	2	12 - 550 ml bottles	10.0000	13	70	25	0
3	15	Genen Shouyu	6	2	24 - 250 ml bottles	15.5000	39	0	5	0
4	34	Sasquatch 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.

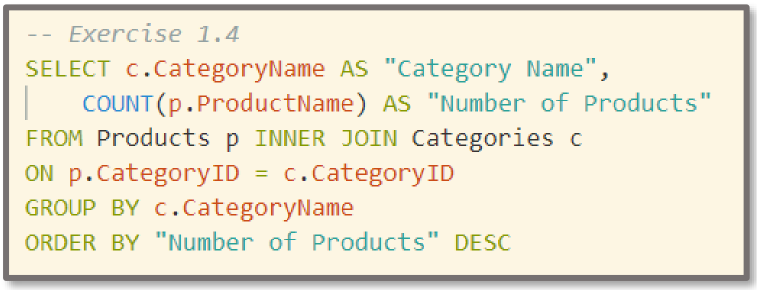


```sql
-- Exercise 1.3
SELECT p.* , s.CompanyName, s.Country
FROM Products p INNER JOIN Suppliers s On p.SupplierID = s.SupplierID
WHERE p.QuantityPerUnit LIKE '%bottle%'
```

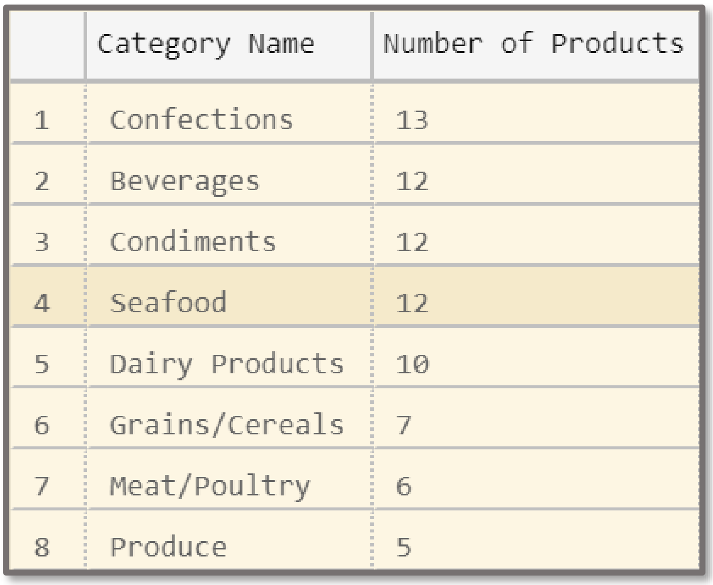


	ProductID	ProductName	SupplierID	CategoryID	QuantityPerUnit	UnitPrice	UnitsInStock	UnitsOnOrder	ReorderLevel	Discontinued	CompanyName	Country
1	2	Chang	1	1	24 - 12 oz bottles	19.0000	17	40	25	0	Exotic Liquids	UK
2	3	Aniseed Syrup	1	2	12 - 550 ml bottles	10.0000	13	70	25	0	Exotic Liquids	UK
3	15	Genen 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 Sto…	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	263.50…	17	0	15	0	Aux joyeux ecclé…	Fran…
7	39	Chartreuse v…	18	1	750 cc per bottle	18.0000	69	0	5	0	Aux joyeux ecclé…	Fran…
8	61	Sirop d'érab…	29	2	24 - 500 ml bottles	28.5000	113	0	25	0	Forêts d'érables	Cana…
9	65	Louisiana Fi…	2	2	32 - 8 oz bottles	21.0500	76	0	0	0	New Orleans Caju…	USA
1…	67	Laughing Lum…	16	1	24 - 12 oz bottles	14.0000	52	0	10	0	Bigfoot Breweries	USA
1…	70	Outback Lager	7	1	24 - 355 ml bottles	15.0000	15	10	30	0	Pavlova, Ltd.	Aust…
1…	75	Rhönbräu Klo…	12	1	24 - 0.5 l bottles	7.7500	125	0	25	0	Plutzer Lebensmi…	Germ…

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.

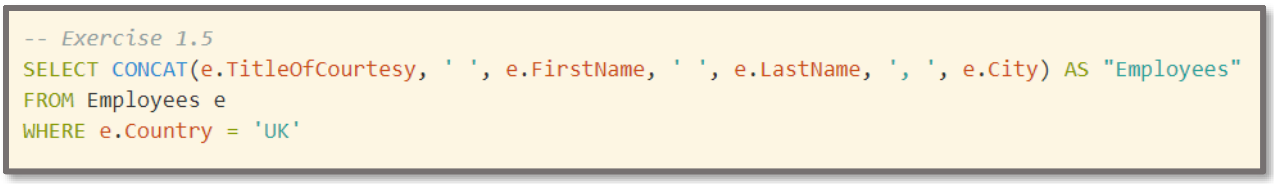


```sql
-- Exercise 1.4
SELECT c.CategoryName AS "Category Name",
    COUNT(p.ProductName) AS "Number of Products"
FROM Products p INNER JOIN Categories c
ON p.CategoryID = c.CategoryID
GROUP BY c.CategoryName
ORDER BY "Number of Products" DESC
```

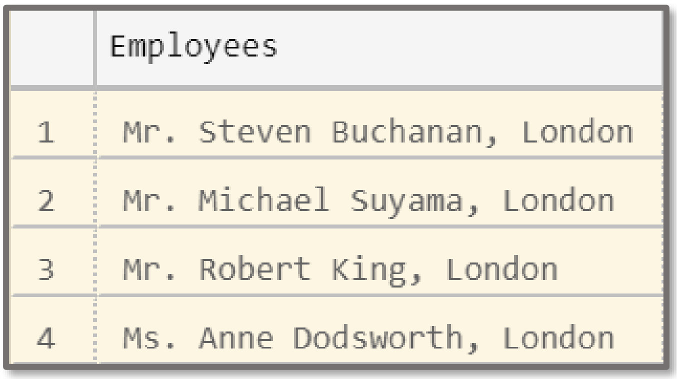


	Category Name	Number of Products
1	Confections	13
2	Beverages	12
3	Condiments	12
4	Seafood	12
5	Dairy Products	10
6	Grains/Cereals	7
7	Meat/Poultry	6
8	Produce	5

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.*

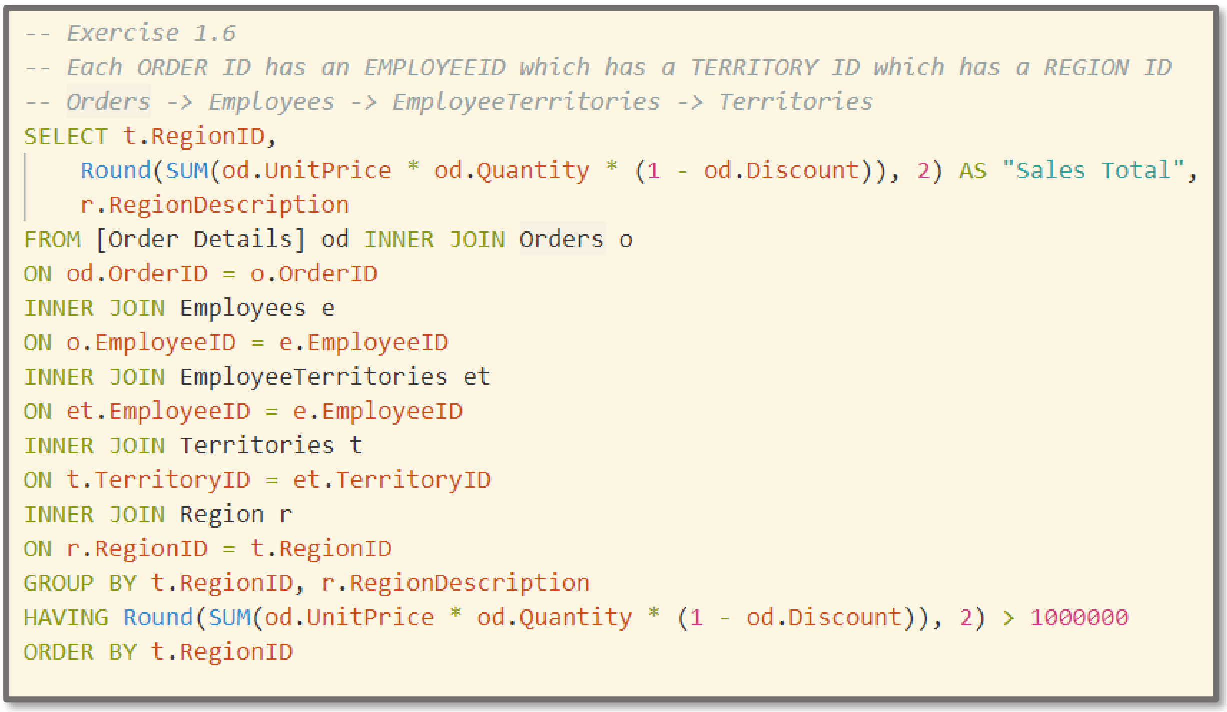


```
-- Exercise 1.5
SELECT CONCAT(e.TitleOfCourtesy, ' ', e.FirstName, ' ', e.LastName, ', ', e.City) AS "Employees"
FROM Employees e
WHERE e.Country = 'UK'
```

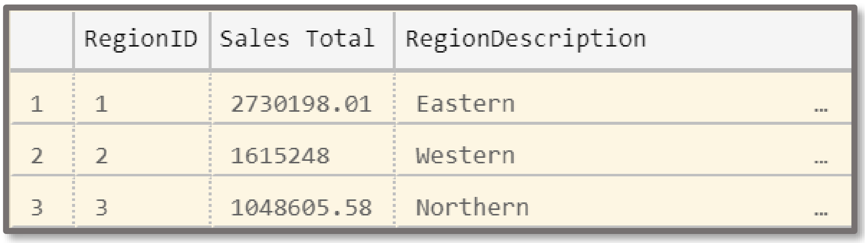


	Employees
1	Mr. Steven Buchanan, London
2	Mr. Michael Suyama, London
3	Mr. Robert King, London
4	Ms. Anne Dodsworth, London

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.*

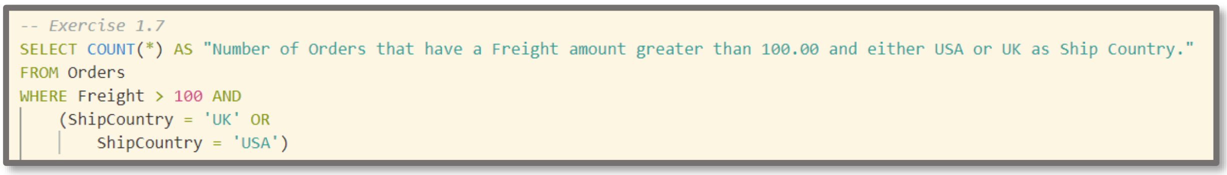


```
-- Exercise 1.6
-- Each ORDER ID has an EMPLOYEEID which has a TERRITORY ID which has a REGION ID
-- Orders -> Employees -> EmployeeTerritories -> Territories
SELECT t.RegionID,
    Round(SUM(od.UnitPrice * od.Quantity * (1 - od.Discount)), 2) AS "Sales Total",
    r.RegionDescription
FROM [Order Details] od INNER JOIN Orders o
ON od.OrderID = o.OrderID
INNER JOIN Employees e
ON o.EmployeeID = e.EmployeeID
INNER JOIN EmployeeTerritories et
ON et.EmployeeID = e.EmployeeID
INNER JOIN Territories t
ON t.TerritoryID = et.TerritoryID
INNER JOIN Region r
ON r.RegionID = t.RegionID
GROUP BY t.RegionID, r.RegionDescription
HAVING Round(SUM(od.UnitPrice * od.Quantity * (1 - od.Discount)), 2) > 1000000
ORDER BY t.RegionID
```

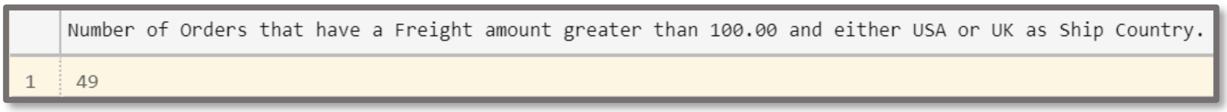


	RegionID	Sales Total	RegionDescription
1	1	2730198.01	Eastern …
2	2	1615248	Western …
3	3	1048605.58	Northern …

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

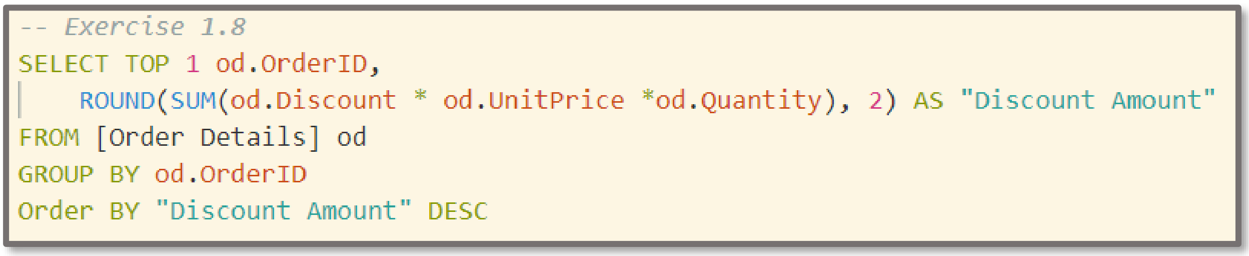


```sql
-- Exercise 1.7
SELECT COUNT(*) AS "Number of Orders that have a Freight amount greater than 100.00 and either USA or UK as Ship Country."
FROM Orders
WHERE Freight > 100 AND
    (ShipCountry = 'UK' OR
        ShipCountry = 'USA')
```

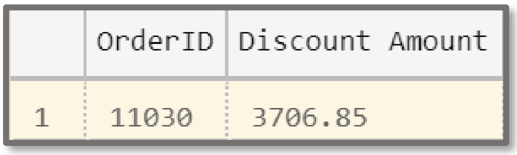


	Number of Orders that have a Freight amount greater than 100.00 and either USA or UK as Ship Country.
1	49

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.*



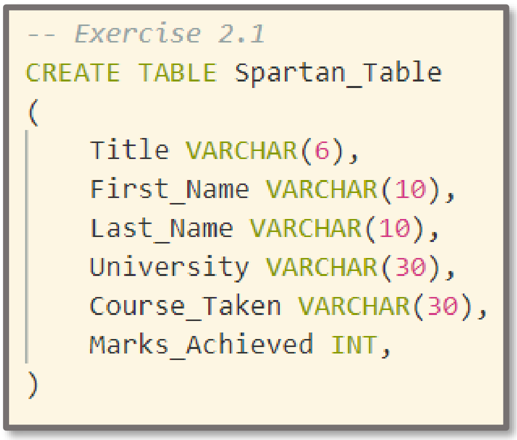
```sql
-- Exercise 1.8
SELECT TOP 1 od.OrderID,
    ROUND(SUM(od.Discount * od.UnitPrice *od.Quantity), 2) AS "Discount Amount"
FROM [Order Details] od
GROUP BY od.OrderID
Order BY "Discount Amount" DESC
```



	OrderID	Discount Amount
1	11030	3706.85

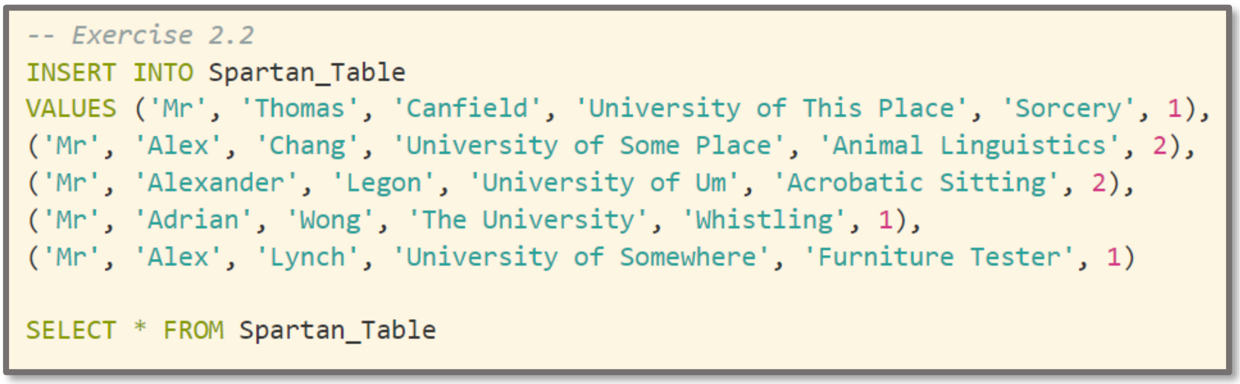
Exercise 2 – Create Spartans Table (20 marks – 10 each)

2.1 Write the correct SQL statement to create a Spartan Table including a Separate Title, First Name and Last Name into separate columns, and include University attended, course taken and mark achieved.

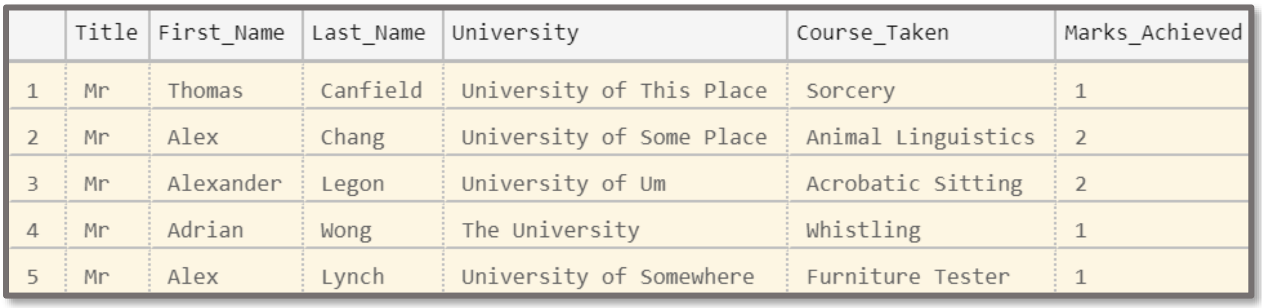


```
-- Exercise 2.1
CREATE TABLE Spartan_Table
(
    Title VARCHAR(6),
    First_Name VARCHAR(10),
    Last_Name VARCHAR(10),
    University VARCHAR(30),
    Course_Taken VARCHAR(30),
    Marks_Achieved INT,
)
```

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



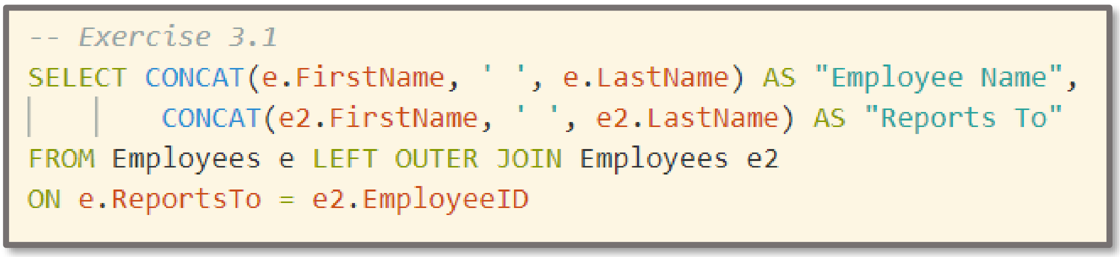
```
-- Exercise 2.2
INSERT INTO Spartan_Table
VALUES ('Mr', 'Thomas', 'Canfield', 'University of This Place', 'Sorcery', 1),
('Mr', 'Alex', 'Chang', 'University of Some Place', 'Animal Linguistics', 2),
('Mr', 'Alexander', 'Legon', 'University of Um', 'Acrobatic Sitting', 2),
('Mr', 'Adrian', 'Wong', 'The University', 'Whistling', 1),
('Mr', 'Alex', 'Lynch', 'University of Somewhere', 'Furniture Tester', 1)

SELECT * FROM Spartan_Table
```



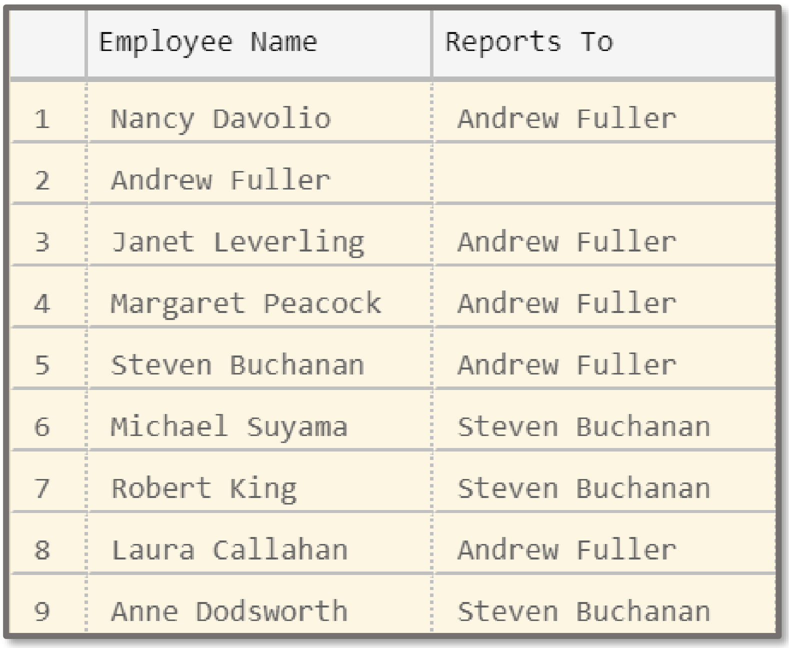
	Title	First_Name	Last_Name	University	Course_Taken	Marks_Achieved
1	Mr	Thomas	Canfield	University of This Place	Sorcery	1
2	Mr	Alex	Chang	University of Some Place	Animal Linguistics	2
3	Mr	Alexander	Legon	University of Um	Acrobatic Sitting	2
4	Mr	Adrian	Wong	The University	Whistling	1
5	Mr	Alex	Lynch	University of Somewhere	Furniture Tester	1

EXERCISE 3 – NORTHWIND DATA ANALYSIS LINKED TO EXCEL (30 MARKS)

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)

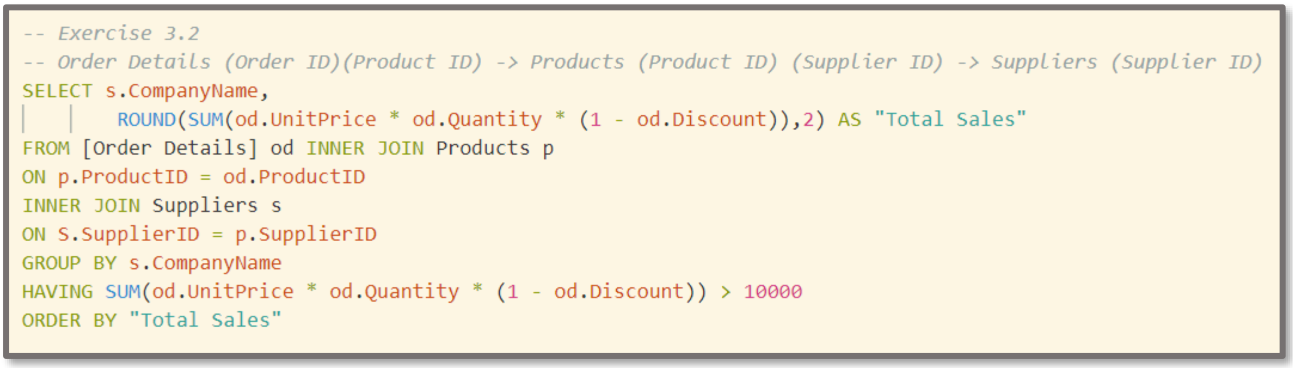


```
-- Exercise 3.1
SELECT CONCAT(e.FirstName, ' ', e.LastName) AS "Employee Name",
        CONCAT(e2.FirstName, ' ', e2.LastName) AS "Reports To"
FROM Employees e LEFT OUTER JOIN Employees e2
ON e.ReportsTo = e2.EmployeeID
```

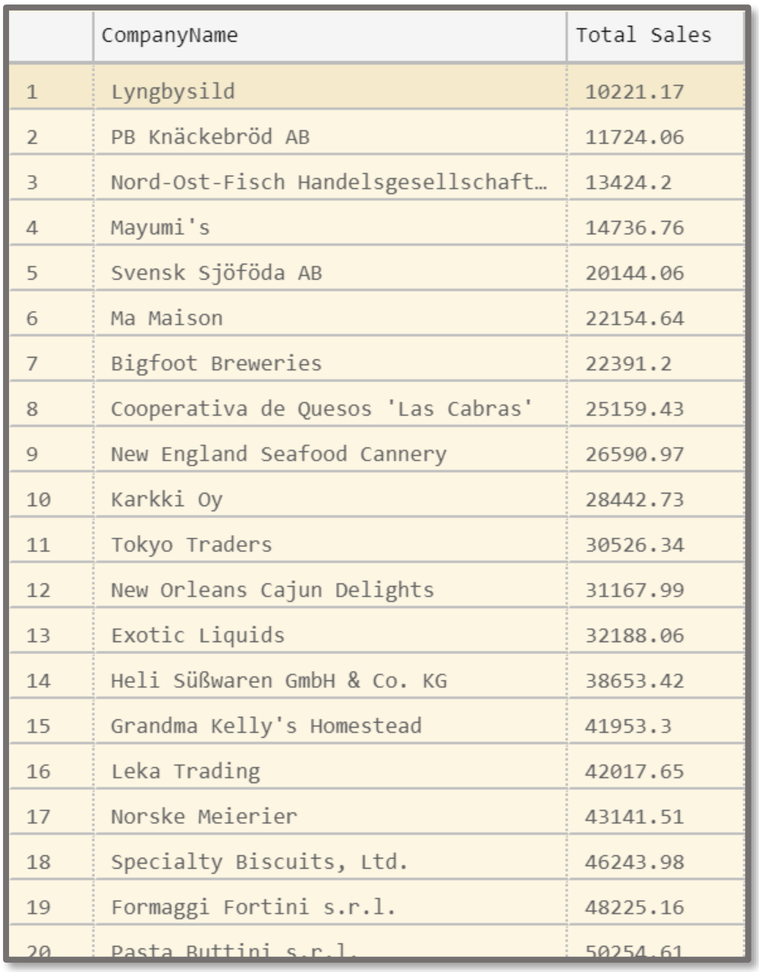


	Employee Name	Reports To
1	Nancy Davolio	Andrew Fuller
2	Andrew Fuller	
3	Janet Leverling	Andrew Fuller
4	Margaret Peacock	Andrew Fuller
5	Steven Buchanan	Andrew Fuller
6	Michael Suyama	Steven Buchanan
7	Robert King	Steven Buchanan
8	Laura Callahan	Andrew Fuller
9	Anne Dodsworth	Steven Buchanan

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: (5 Marks)

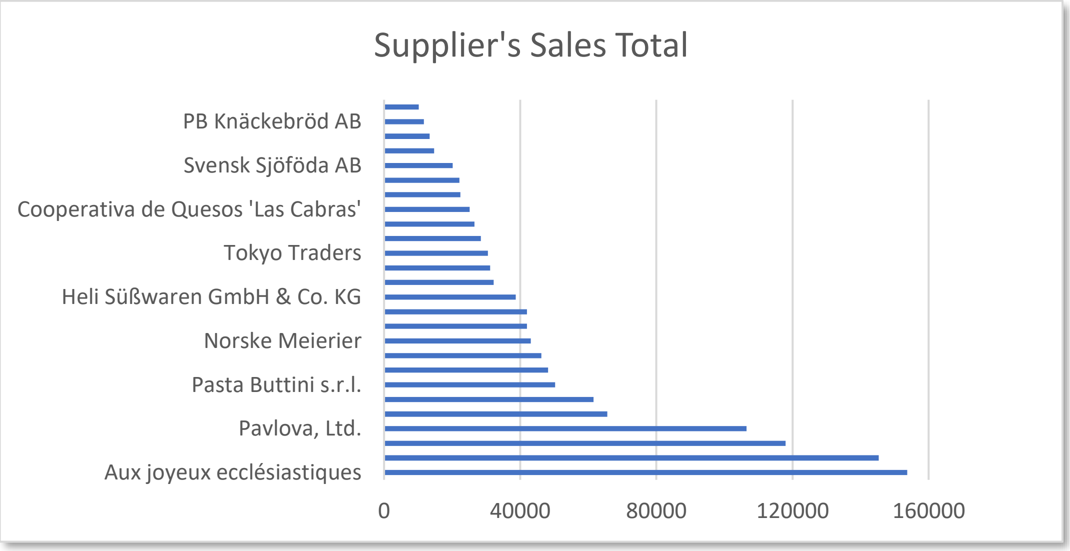


```
-- Exercise 3.2
-- Order Details (Order ID)(Product ID) -> Products (Product ID) (Supplier ID) -> Suppliers (Supplier ID)
SELECT s.CompanyName,
        ROUND(SUM(od.UnitPrice * od.Quantity * (1 - od.Discount)),2) AS "Total Sales"
FROM [Order Details] od INNER JOIN Products p
ON p.ProductID = od.ProductID
INNER JOIN Suppliers s
ON S.SupplierID = p.SupplierID
GROUP BY s.CompanyName
HAVING SUM(od.UnitPrice * od.Quantity * (1 - od.Discount)) > 10000
ORDER BY "Total Sales"
```



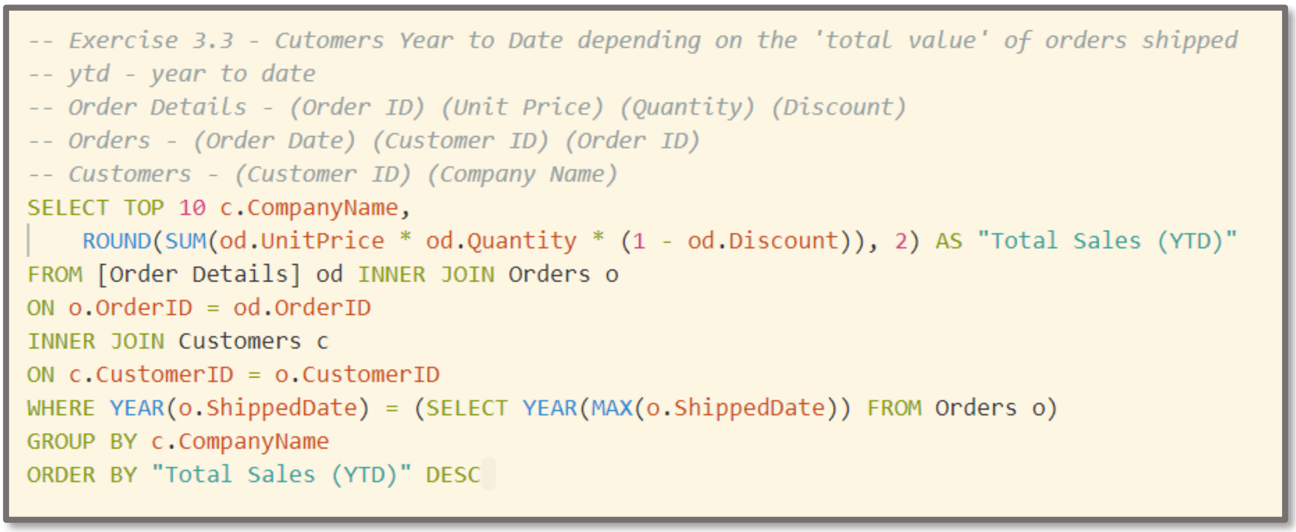
	CompanyName	Total Sales
1	Lyngbysild	10221.17
2	PB Knäckebröd AB	11724.06
3	Nord-Ost-Fisch Handelsgesellschaft…	13424.2
4	Mayumi's	14736.76
5	Svensk Sjöföda AB	20144.06
6	Ma Maison	22154.64
7	Bigfoot Breweries	22391.2
8	Cooperativa de Quesos 'Las Cabras'	25159.43
9	New England Seafood Cannery	26590.97
10	Karkki Oy	28442.73
11	Tokyo Traders	30526.34
12	New Orleans Cajun Delights	31167.99
13	Exotic Liquids	32188.06
14	Heli Süßwaren GmbH & Co. KG	38653.42
15	Grandma Kelly's Homestead	41953.3
16	Leka Trading	42017.65
17	Norske Meierier	43141.51
18	Specialty Biscuits, Ltd.	46243.98
19	Formaggi Fortini s.r.l.	48225.16
20	Pasta Buttini s.r.l.	50254.61

(with 26 rows in total)

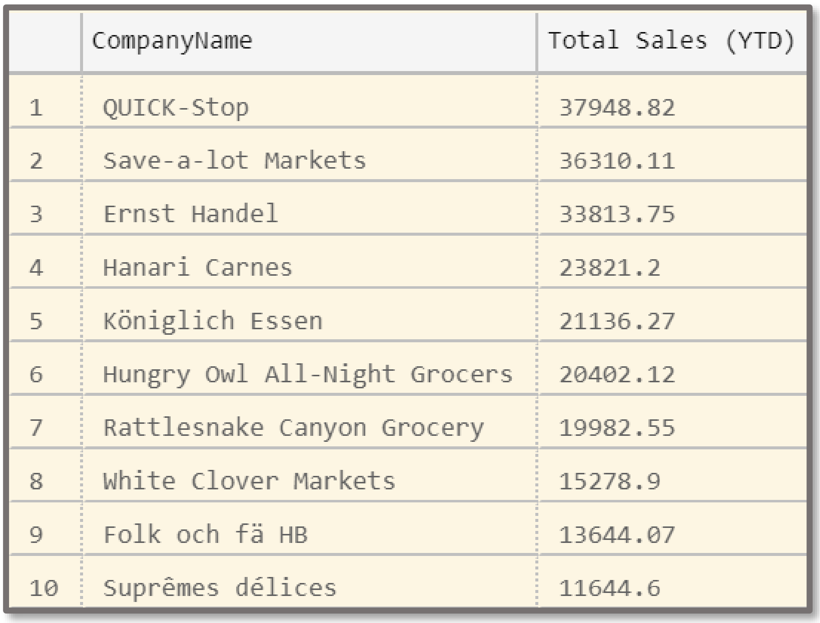


Supplier VS Sales Total

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)

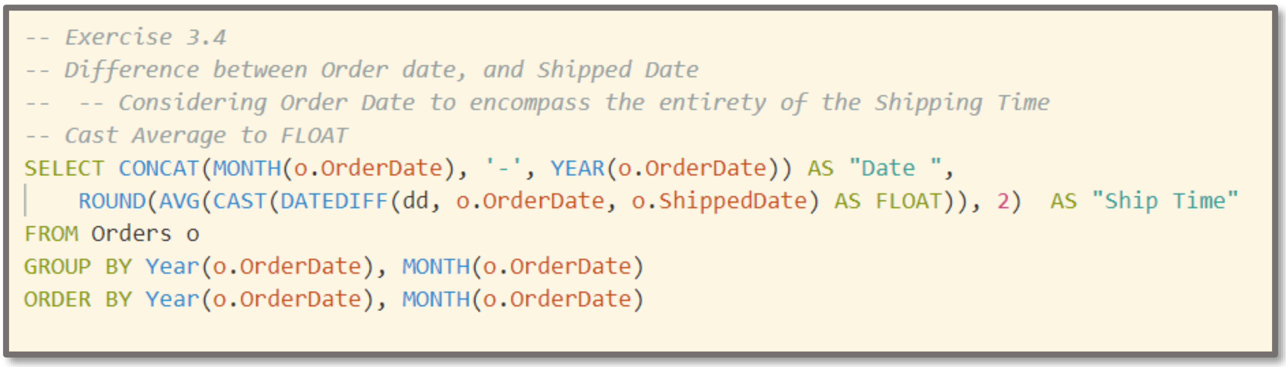


```sql
-- Exercise 3.3 - Cutomers Year to Date depending on the 'total value' of orders shipped
-- ytd - year to date
-- Order Details - (Order ID) (Unit Price) (Quantity) (Discount)
-- Orders - (Order Date) (Customer ID) (Order ID)
-- Customers - (Customer ID) (Company Name)
SELECT TOP 10 c.CompanyName,
    ROUND(SUM(od.UnitPrice * od.Quantity * (1 - od.Discount)), 2) AS "Total Sales (YTD)"
FROM [Order Details] od INNER JOIN Orders o
ON o.OrderID = od.OrderID
INNER JOIN Customers c
ON c.CustomerID = o.CustomerID
WHERE YEAR(o.ShippedDate) = (SELECT YEAR(MAX(o.ShippedDate)) FROM Orders o)
GROUP BY c.CompanyName
ORDER BY "Total Sales (YTD)" DESC
```

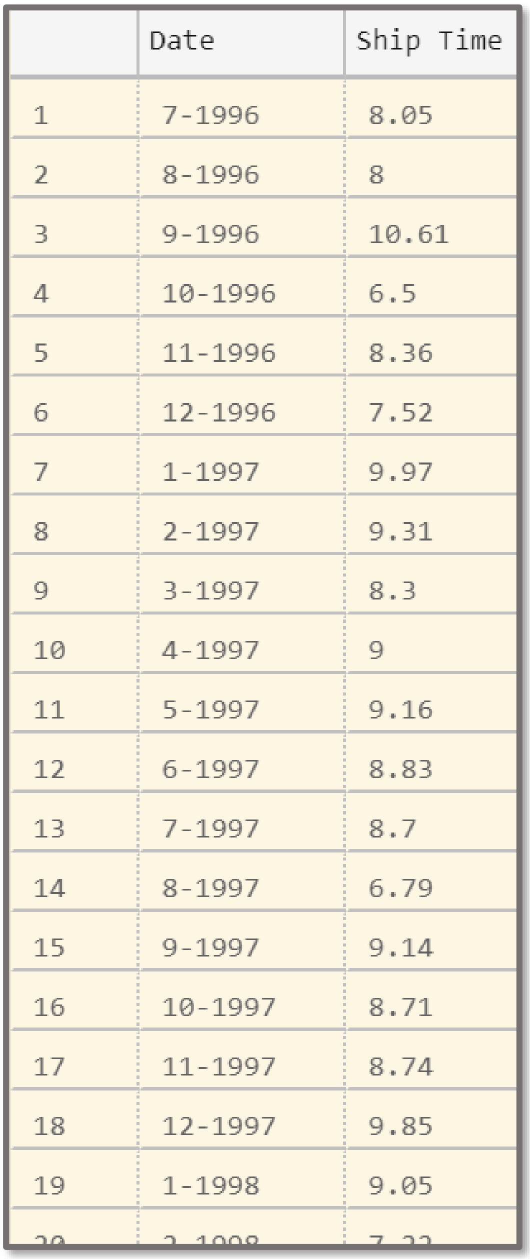


	CompanyName	Total Sales (YTD)
1	QUICK-Stop	37948.82
2	Save-a-lot Markets	36310.11
3	Ernst Handel	33813.75
4	Hanari Carnes	23821.2
5	Königlich Essen	21136.27
6	Hungry Owl All-Night Grocers	20402.12
7	Rattlesnake Canyon Grocery	19982.55
8	White Clover Markets	15278.9
9	Folk och fä HB	13644.07
10	Suprêmes délices	11644.6

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

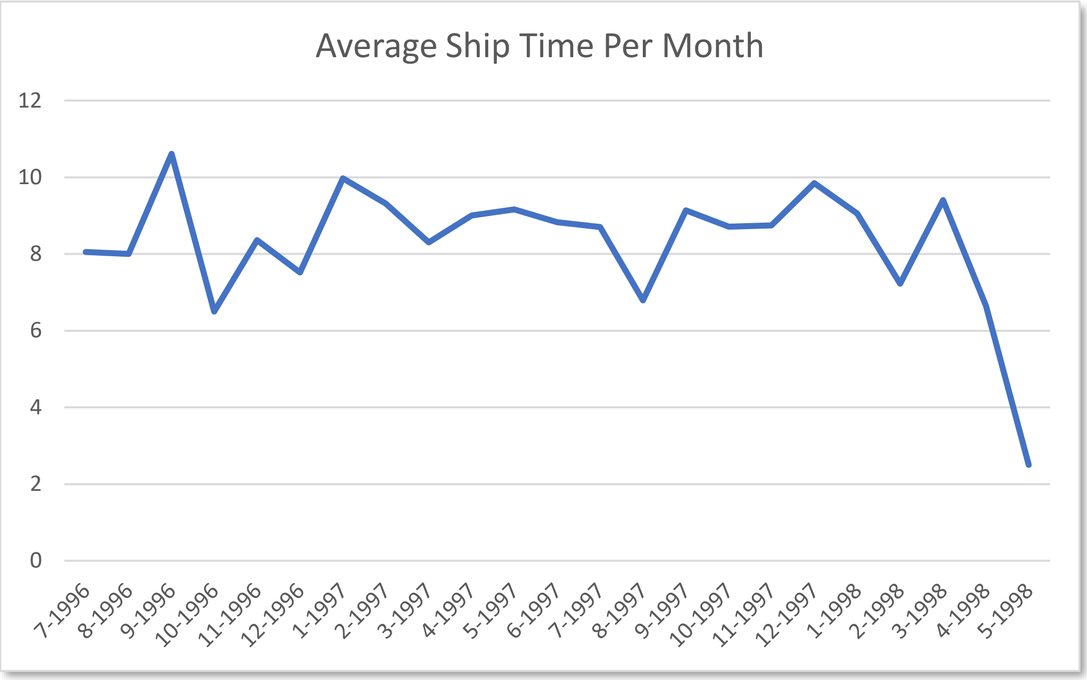


```
-- Exercise 3.4
-- Difference between Order date, and Shipped Date
--   -- Considering Order Date to encompass the entirety of the Shipping Time
-- Cast Average to FLOAT
SELECT CONCAT(MONTH(o.OrderDate), '-', YEAR(o.OrderDate)) AS "Date ",
    ROUND(AVG(CAST(DATEDIFF(dd, o.OrderDate, o.ShippedDate) AS FLOAT)), 2)  AS "Ship Time"
FROM Orders o
GROUP BY Year(o.OrderDate), MONTH(o.OrderDate)
ORDER BY Year(o.OrderDate), MONTH(o.OrderDate)
```



	Date	Ship Time
1	7-1996	8.05
2	8-1996	8
3	9-1996	10.61
4	10-1996	6.5
5	11-1996	8.36
6	12-1996	7.52
7	1-1997	9.97
8	2-1997	9.31
9	3-1997	8.3
10	4-1997	9
11	5-1997	9.16
12	6-1997	8.83
13	7-1997	8.7
14	8-1997	6.79
15	9-1997	9.14
16	10-1997	8.71
17	11-1997	8.74
18	12-1997	9.85
19	1-1998	9.05
20	2-1998	7.22

(with 23 rows in total)



Average Ship Time VS Month